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240 Clifton West Road

Stormwater Management Plan

April 2025

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1 Introduction

This report details the water sensitive urban design and stormwater management response to the masterplan of a proposed low density rural development at 240 Clifton West Road, Mt Taylor (Site).

Water quality modelling using long term continuous rainfall records from the local area shows that the proposed stormwater treatment measures will meet Best Practice Environmental standards.

External catchment flows are estimated in consultation with the East Gippsland Catchment Management Authority to show that peak 1% AEP events from the site and external upstream catchments can be safely conveyed through the site.

Hydraulic analysis of the flows through the site and treatment facilities proposed are undertaken using industry standard software to ensure that flows up to and including the 1% AEP event can be managed and flow velocity does not cause any detrimental effects to downstream environs.

2 Subject Site Description

The total subject development site area is located 6.7km north of Bairnsdale CBD and is bounded by Clifton West Road to the west and farmland on all other sides.

Centre co-ordinates: -37.767485, 147.612349

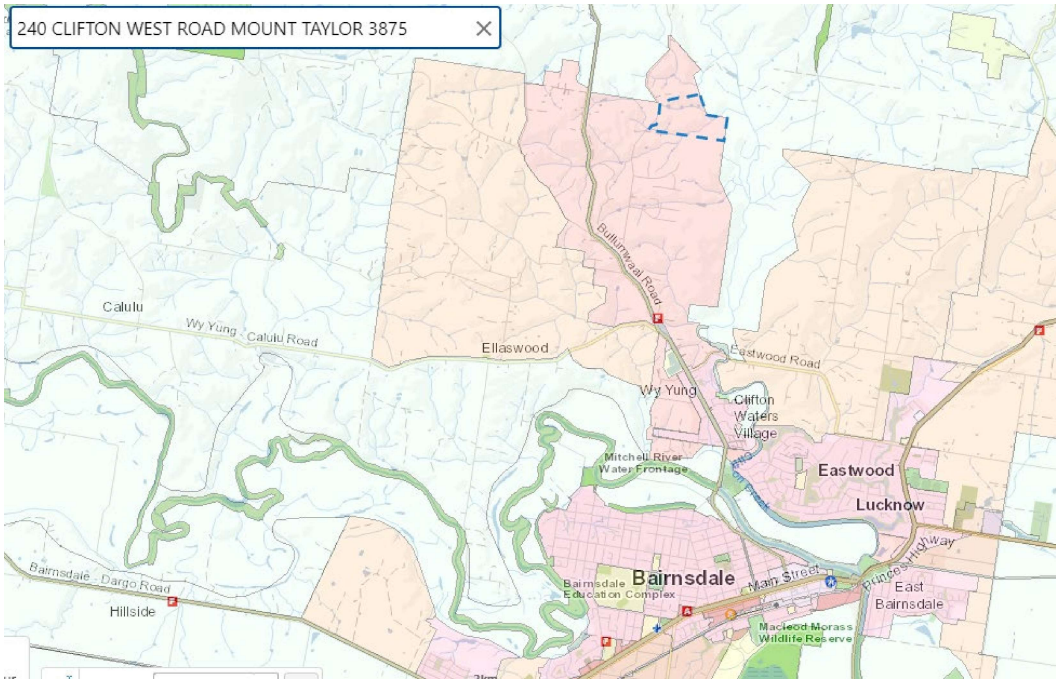

Figure 1: Site Location

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The subject site has 4 existing dams and a small abandoned dwelling and shedding at the entrance to 240 Clifton West Road on the western boundary. The site is used for cattle grazing and is for all intents, totally pervious.

Figure 2: Subject Site Locality

Total internal area is approximately 43.7ha.

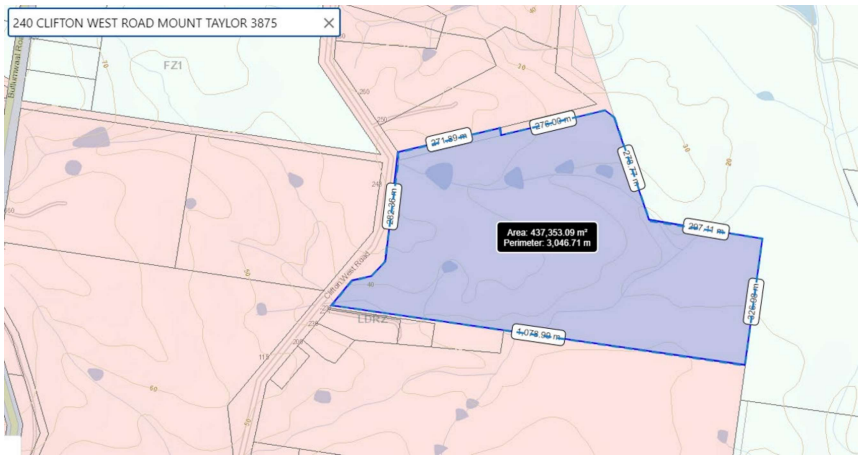

Figure 3: Subject Site Area

A recent survey of the site shows that the topography of the site varies considerably with two main gullies conveying flows the site from west to east. The highest point on site is RL

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55m AHD at the existing dwelling site on the western boundary to RL 20.5m at the eastern end of the site.

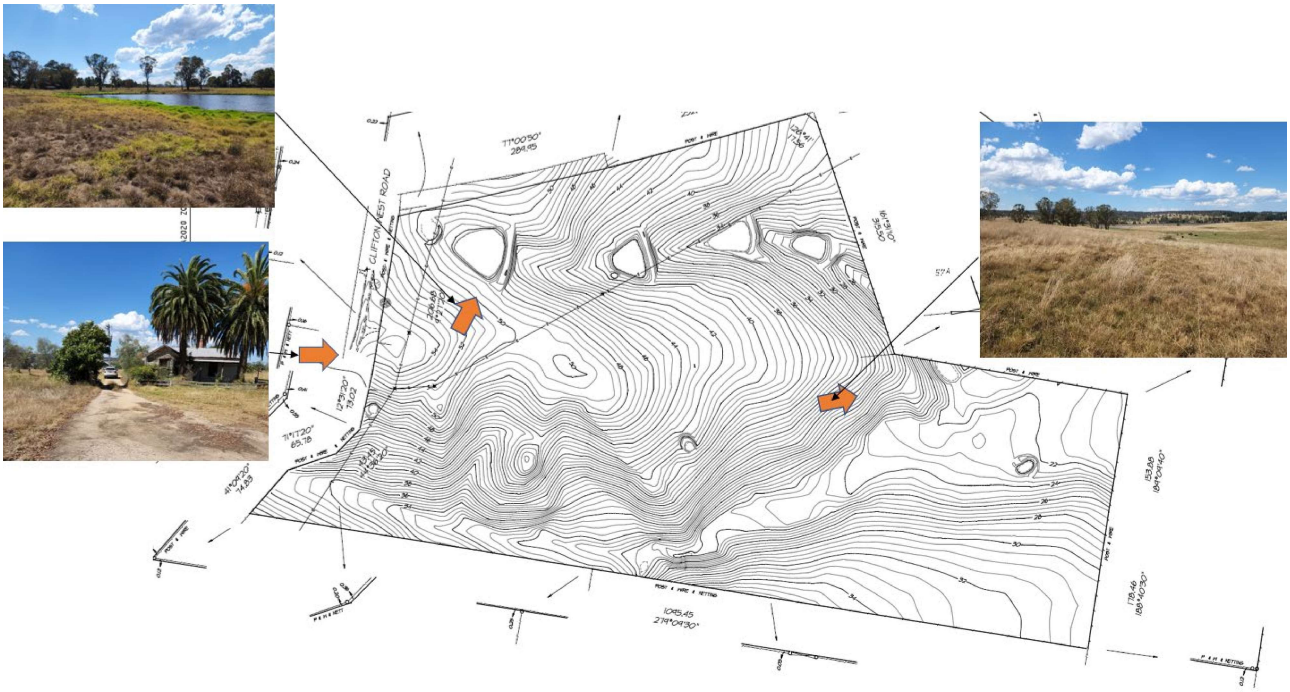

Figure 4: Survey

Site photos taken at the time of inspection show that the site is currently grassed.

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3 External Catchment Analysis

Flows enter the site from three main external catchments with the flows entering the southern boundary connected to the largest external catchment.

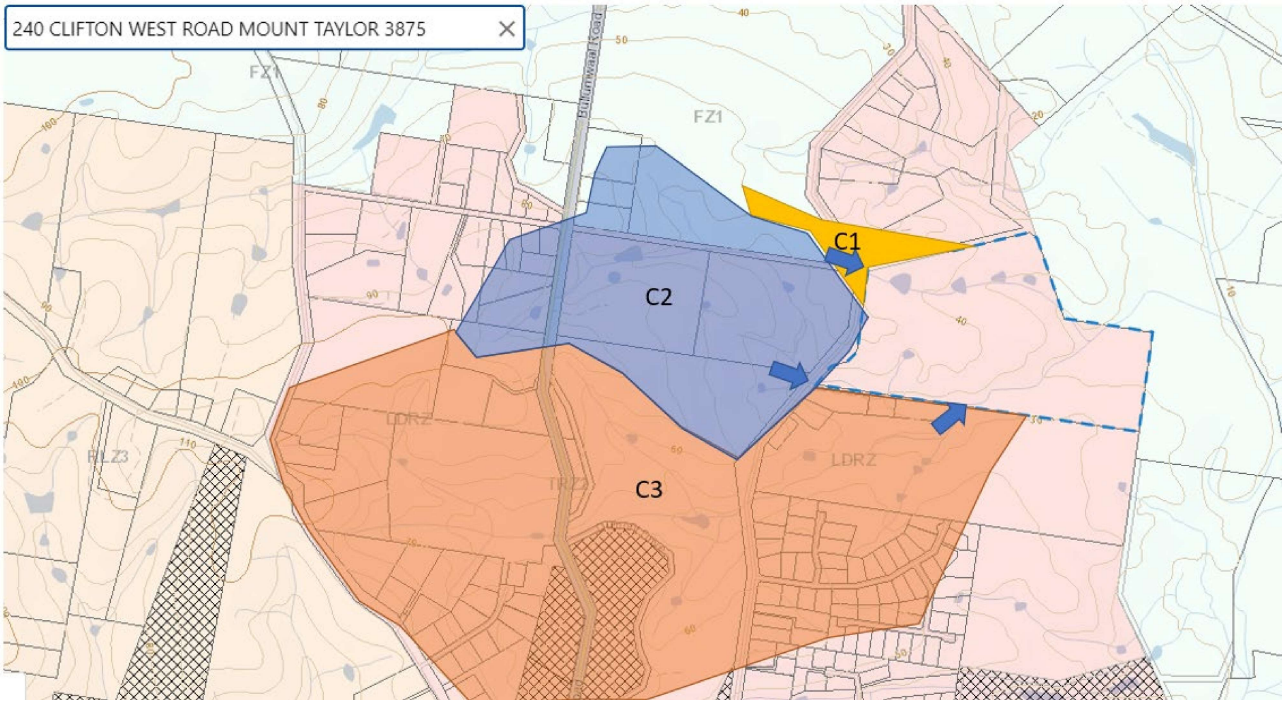

Figure 5: External Catchment Map

From Figure 5, there are sub-catchments within each of the main larger catchments C1, C2 and C3, however each major catchment enters the site in a different location as shown above. Mount Lookout Road is situated on a local ridge and forms the western most catchment boundary.

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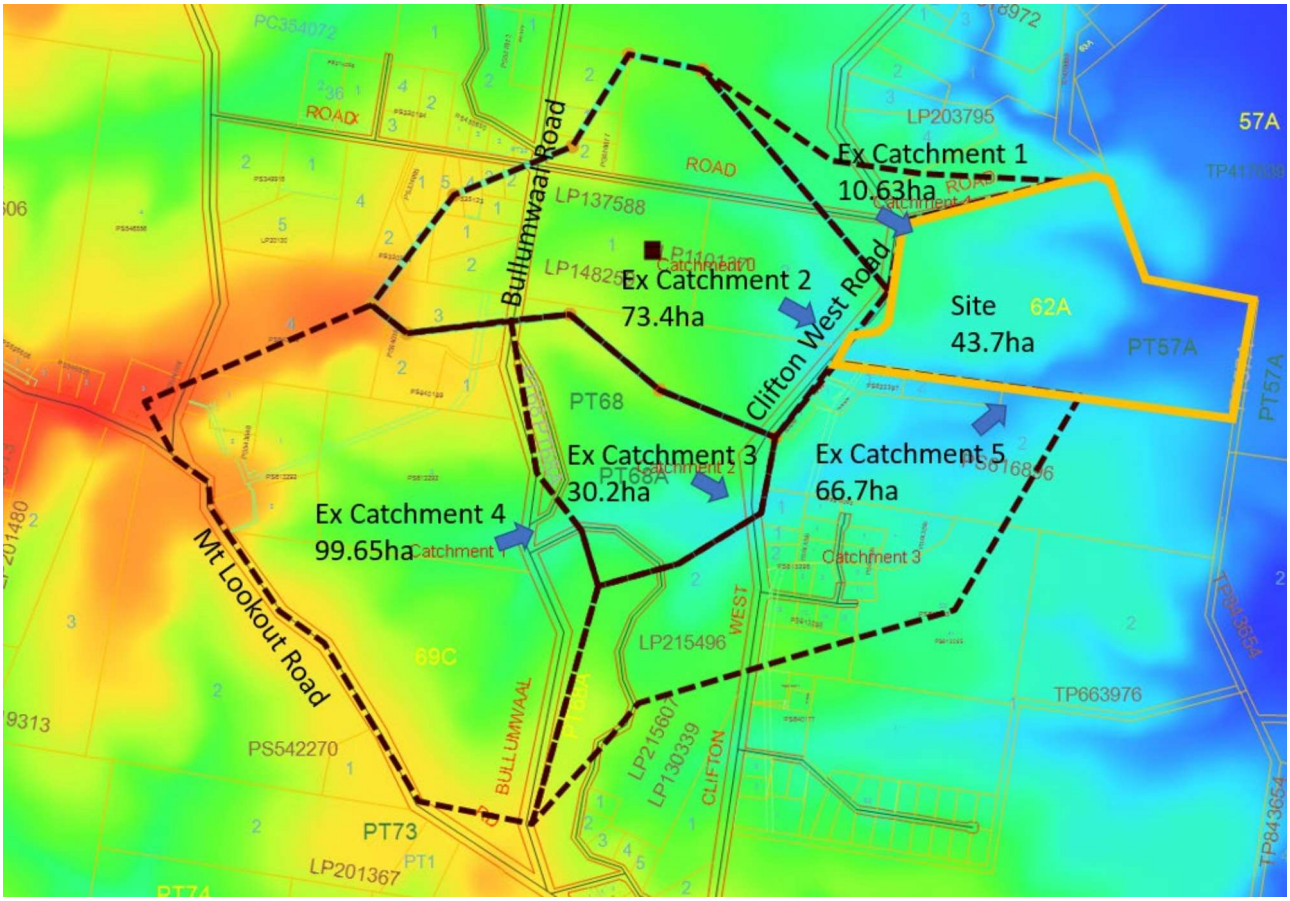

Figure 6: External Catchment Areas

To calculate the catchment areas, a digital elevation map (DEM) was downloaded and catchments delineated in greater detail. Elevations range from RL 110m AHD in the west to RL 20m AHD in the east.

External Catchment Data:

Name	Area (ha)	FI (est)	Ave Slope (%)
C1	10.63	0	1.78
C2	73.4	5	4.81
C3	30.2	0	5.52
C4	99.65	5	5.40
C5	66.7	10	3.55

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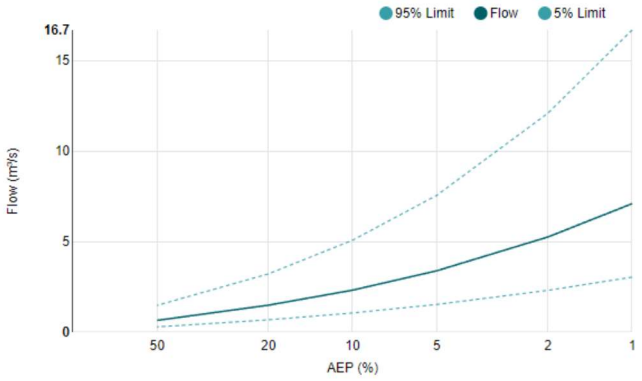
3.1 Calculation of External Flows

In discussion with the EGCMA, the external catchments are not gauged and hence there is no previous flood mapping available. It was agreed that the Regional Estimate procedures would be sufficient to estimate peak 1% AEP event flows.

Data values of catchment area were input into the RFFE model.

Results | Regional Flood Frequency Estimation Model



*The catchment has unusual shape. Results have lower accuracy and may not be directly applicable in practice.

AEP (%)	Discharge (m^3/s)	Lower Confidence Limit (5%) (m^3/s)	Upper Confidence Limit (95%) (m^3/s)
50	0.650	0.290	1.48
20	1.49	0.680	3.22
10	2.32	1.06	5.08
5	3.39	1.53	7.56
2	5.26	2.31	12.1
1	7.10	3.04	16.7

Input Data	
Date/Time	2023-06-18 20:02
Catchment Name	Catchment1
Latitude (Outlet)	-37.769
Longitude (Outlet)	147.621
Latitude (Centroid)	-37.77
Longitude (Centroid)	147.6
Catchment Area (km^2)	0.73
Distance to Nearest Gauged Catchment (km)	20.04
50% AEP 6 Hour Rainfall Intensity (mm/h)	6.483888
2% AEP 6 Hour Rainfall Intensity (mm/h)	14.725906
Rainfall Intensity Source (User/Auto)	Auto
Region	East Coast
Region Version	RFFE Model 2016 v1
Region Source (User/Auto)	Auto
Shape Factor	2.16*

Figure 7: RFFE Output

In addition to the RFFE, regional equations will be used as a check and RORB modelling estimates also included using ARR 2019 procedures.

A check of the flow value using Melbourne Water's rural flow estimate equation:

$Q = 4.67A^{0.763}$ where A is in km^2 yields

$Q = 4.67 \times 0.73^{0.763}$

Q = 3.67m3/s (which yields a result closer to the RFFE lower confidence limit).

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The RFFE approach provides a wide range of flow values.

The regional equation is a simple empirical check value and is low on all catchment sizes.

A RORB model is a non-linear approach and uses the ARR 2019 methods and takes into account catchment area, reach length, slope and loss models.

Loss model adopted as per ARR Datahub: IL 18mm CL 3.4mm

Key inputs: m = 0.8, kc (Pearce kc=1.25 D_{ave}) = 2.09

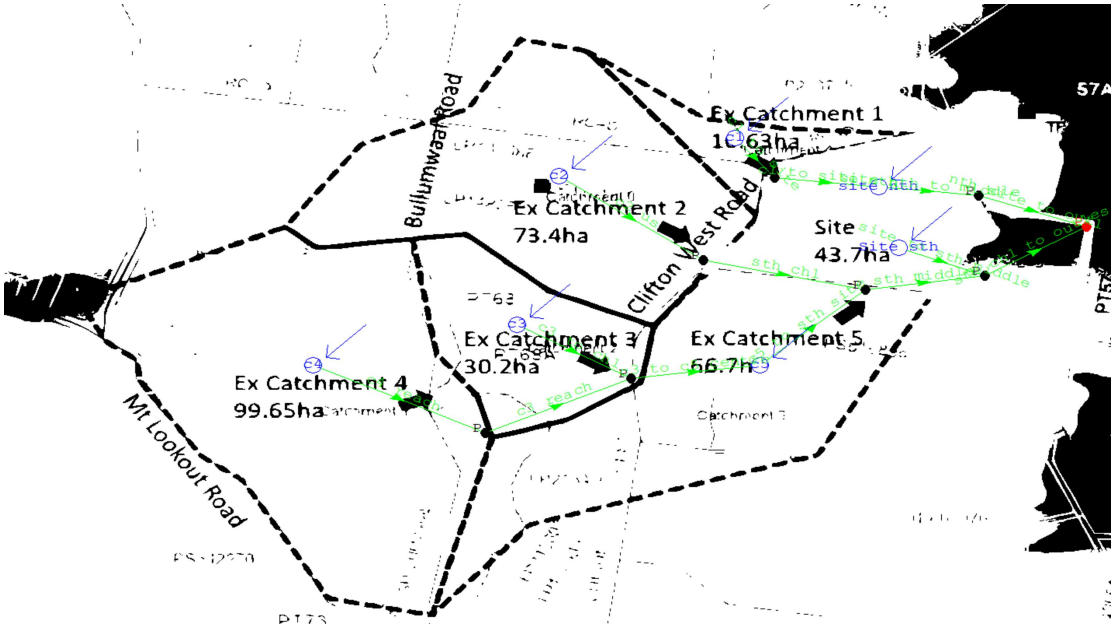

Figure 8: RORB Model

The model was run for the 1% AEP across durations up to 12 hours.

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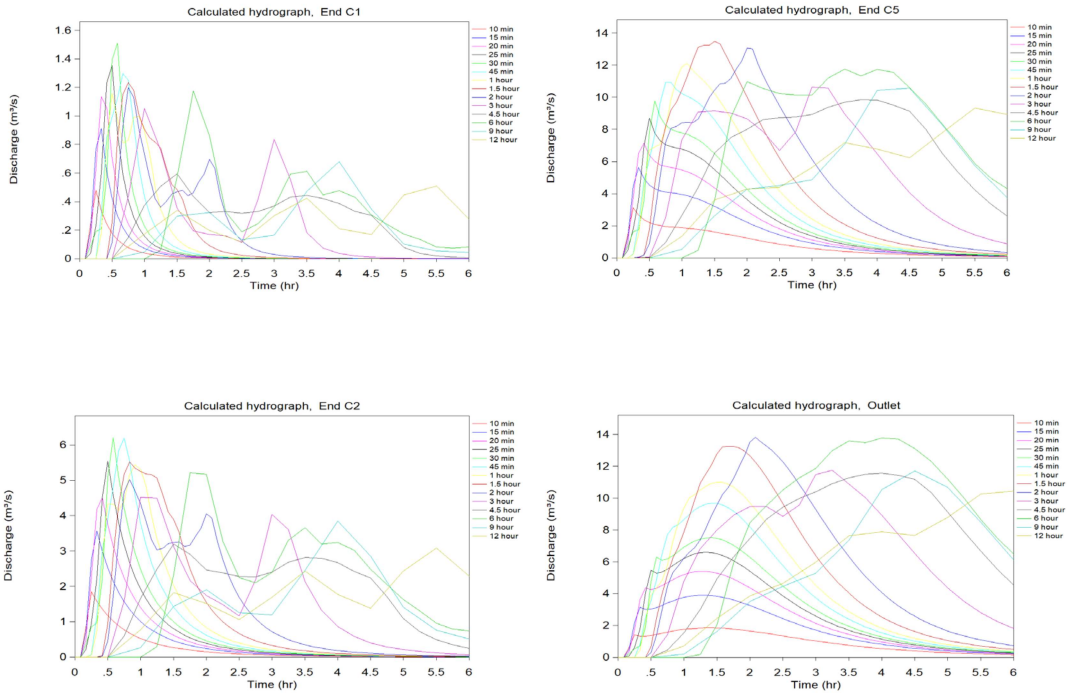

For each Catchment area, the peak 1% flow results obtained were:

Catchment	RFFE 1% AEP (m3/s) (lower range – upper)	Regional Equation	RORB (Critical duration in hrs)
C1	2.53	0.82	1.5 (0.6)
C2	7.10 (3.04 – 16.7)	3.67	6.2 (0.6hr)
C3 – C4 -C5	13.8 (5.89 – 32.5)	7.8	13.4 (1.5hr)
Outlet (including subject site)			13.7 (2hr)

The RORB model results are within the confidence intervals of the RFFE and reasonably close to the RFFE flow value. It is proposed to be adopted the RORB values for the external flow values entering the subject site.

The final existing conditions outlet value in the above table shows the combined hydrograph including the subject site. The subject site flows into the Clifton Creek to the east.

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4 Internal Catchment Analysis

Within the site, the site falls in two main flow directions.

The northern portion of the site has 4 dams in sequence following a natural valley from RL 50.7 At Clifton West Road and falls to approximately RL 23.2m AHD at the eastern boundary. The northern catchment has been further delineated into three catchments.

In the southern part of the site, the land falls into the main valley that runs along the southern boundary and through to the east where it flows into an open paddock and onto Clifton Creek further east. The southern portion of the site falls from RL 39m AHD at Clifton West road to RL 20.5 at the south eastern edge of the site. Four sub catchments were delineated for the southern half of the site.

All internal catchments are shown in Figure 9.

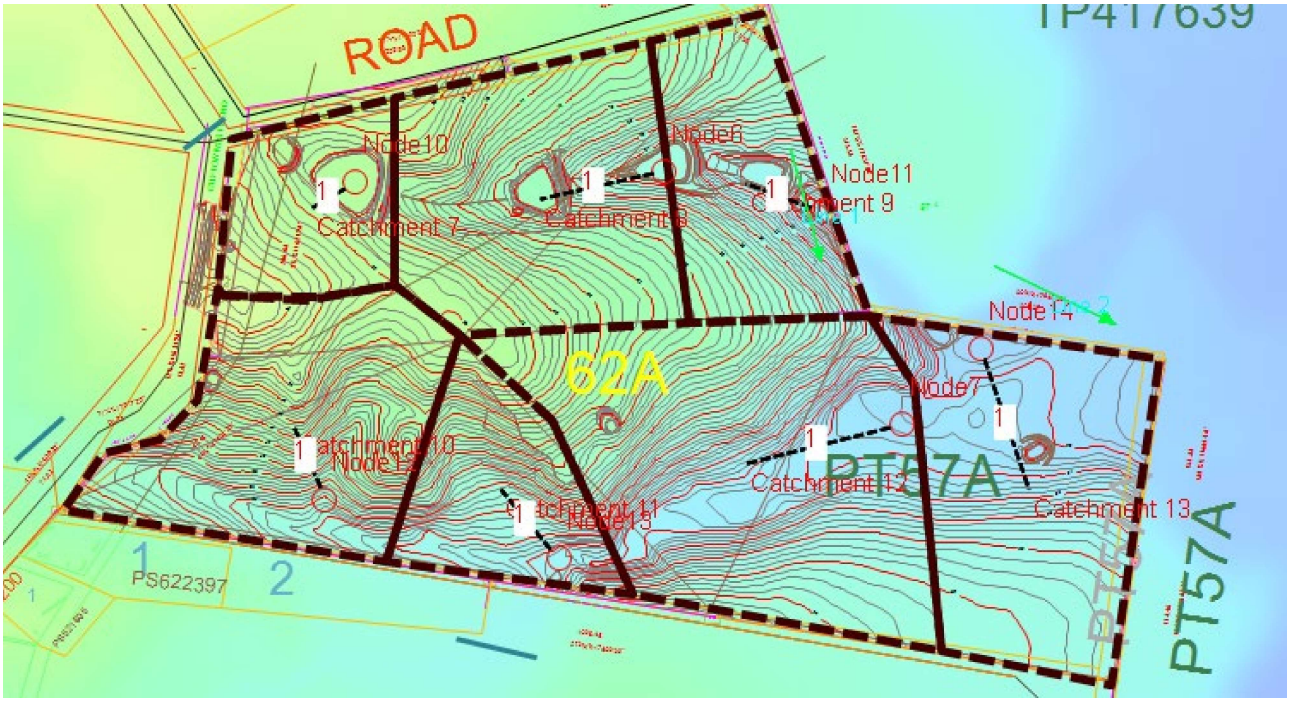

Figure 9: Internal Site Catchments

Flows for the internal and external catchments were run through Tuflow as a 2d model using 5m lidar information obtained from the Elvis database.

For the internal site, non-linear flood routing was employed to determine existing flows that will be added to the external site flows at each node location in Figure 9.

Based on field observations, a long grass surface is consistent across the site and a Mannings value of 0.035 was used to model the existing conditions.

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Node 7 represents the largest internal catchment.

A range of 1% AEP flow events were modelled and the 1hr duration was found to be the critical storm event.

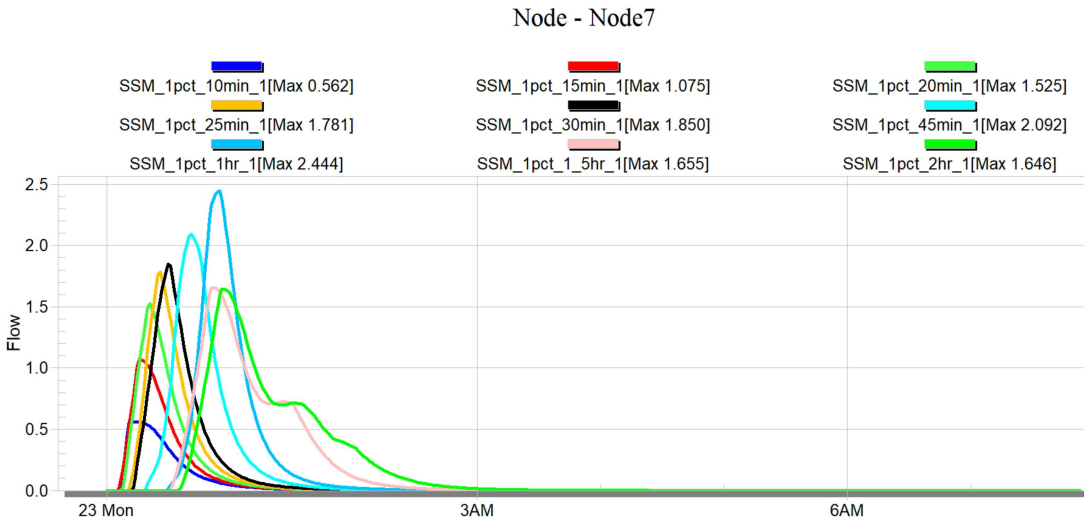

Figure 10: Internal Catchments Flow Peak

The full 2d model of the existing conditions with input hydrographs described earlier and the internal catchment flows shows that the combined outflow of all catchment peaks at approximately 20.5m3/s in the 1% AEP event.

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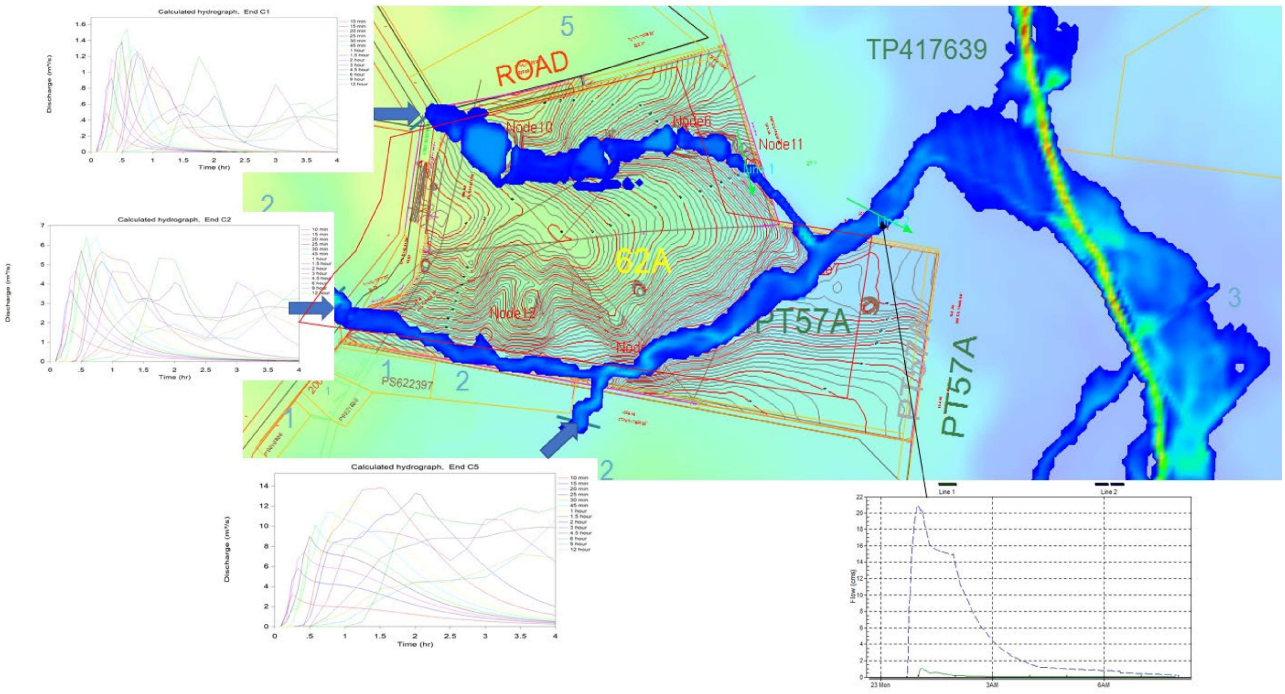

Figure 11: Combined 1% AEP Existing Peak Flow

At the eastern boundary, the northern flow leaves the subject site and rejoins further south.

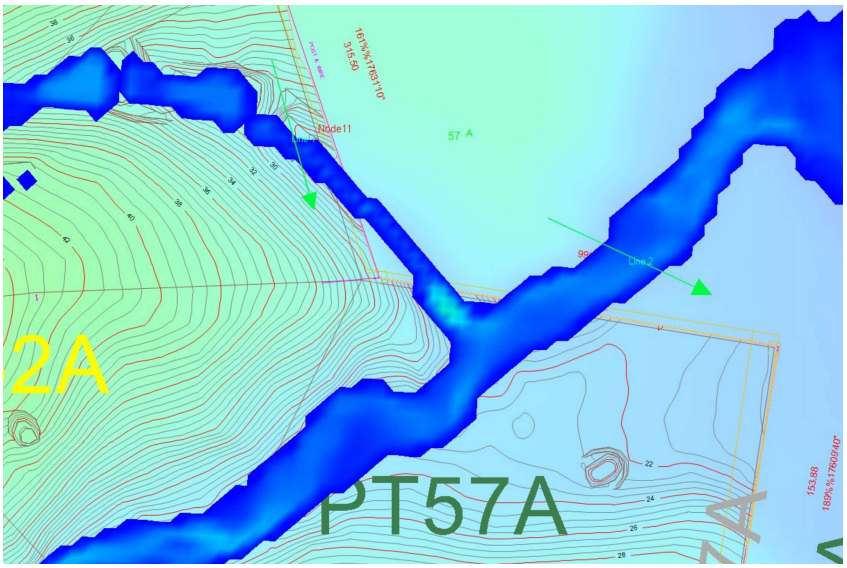

Figure 12: Existing Flow Lines

Although the flow crosses a neighbour's boundary, the flow joins the southern catchment flow line before passing into the downstream property.

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Existing peak flood depth at the south eastern boundary is 20.7m AHD and represents a flow depth of approximately 300mm across a with channel with of 55m.

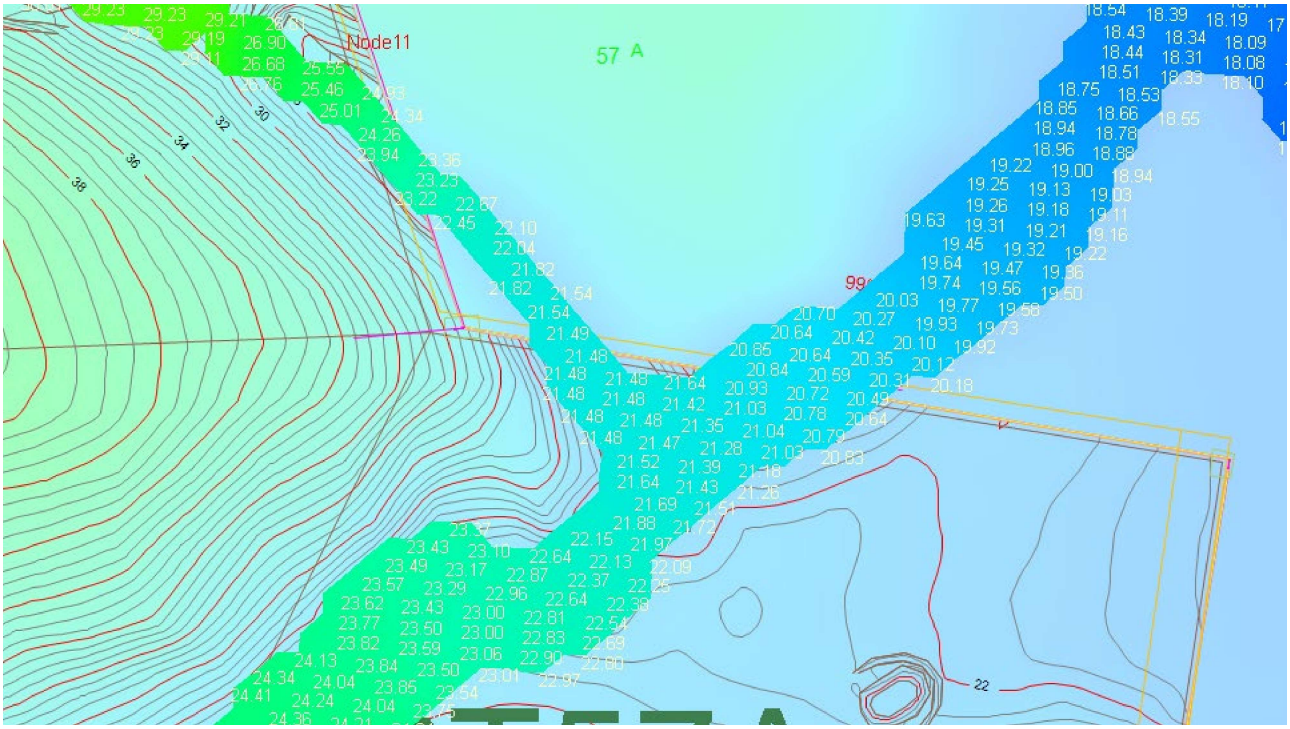

Figure 13: Existing 1% Max Water Elevation (m AHD)

5 Strategic Context and Targets

5.1 Best Practise Environmental Management

Stormwater treatment is driven by the requirement to meet the pollutant removal targets set out in the Best Practice Environmental Management Guidelines (BPEMG) (CSIRO, 1999). These targets are deemed necessary to meet the State Environment Protection Policy (Waters of Victoria) objectives. This SEPP is a statutory policy under section 16 of the Environment Protection Act 1970 that identifies the beneficial uses of Victoria's waterways that need to be protected.

The pollutant removal requirements include:

- Total Suspended Solids (TSS): 80 % removal of the typical urban annual load
- Total Nitrogen (TN): 45 % removal of the typical urban annual load
- Total Phosphorus (TP): 45 % removal of the typical urban annual load
- Litter: 70 % reduction of the typical urban annual load

Water Sensitive Urban Design (WSUD) assets are proposed at the site to meet these water quality requirements for connected pervious surfaces. The assets are sized to ensure that these targets are met.

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5.2 Victorian Planning Provisions: Stormwater management

The Victorian Planning Provisions Clause 56.07 -4 (Stormwater management objectives) state that stormwater systems must be:

> Designed to ensure that flows downstream of the subdivision site are restricted to pre-development levels unless increased flows are approved by the relevant drainage authority and there are no detrimental downstream impacts.

The approach to flood management is in general to equate post development and pre-development peak flow rates for the 1% AEP event such that the development does not have an adverse impact on downstream flooding. This is typically achieved through the addition of retention (or detention) storage within the relevant catchment.

Recent updates to the VPP (Clause 53.18: Stormwater management in urban development) in relation to stormwater management include objectives around not only stormwater flow management and pollution reduction, but also applying integrated water management (IWM) principles, amenity and urban cooling. Specific objectives include:

• To encourage stormwater management that maximises the retention and reuse of stormwater.

• To encourage stormwater management that contributes to cooling, local habitat improvements and provision of attractive and enjoyable spaces.

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The proposed WSUD measures for this low density development include:

- Rainwater tanks on each property for reuse
- Recreational reserve to the north with a low flow channel and sediment basin
- Swale conveyance with drop structures to slow water flows in higher storm events
- Sediment basins to remove suspended solids at the lower end of the site
- A main wetland treatment servicing the northern and southern catchments with high flow bypass.

The southern wetland system is proposed to be offline to the main external flow path to ensure that the proposed wetland system is not hydraulically affected by large storm events.

6 Flooding from Clifton Creek

The site is not known to be subject to flooding from the Clifton Creek and has no LSIO overlay.

To check, previous studies indicate that the peak flow in the Clifton Creek is 110m3/s.

Tuflow was used to apply a 110m3/s flow to the Clifton Creek upstream of the subject site and allowed to flow past the site and exit the model at the south at normal depth. Flows from the subject site and external catchments were ignored for this model.

The result below shows that the subject site is not subject to flooding from the Clifton Creek and that peak flows are contained in Clifton Creek.

Grid size: 4.5m x 4.5m

Mannings n: 0.035

DEM 5m lidar

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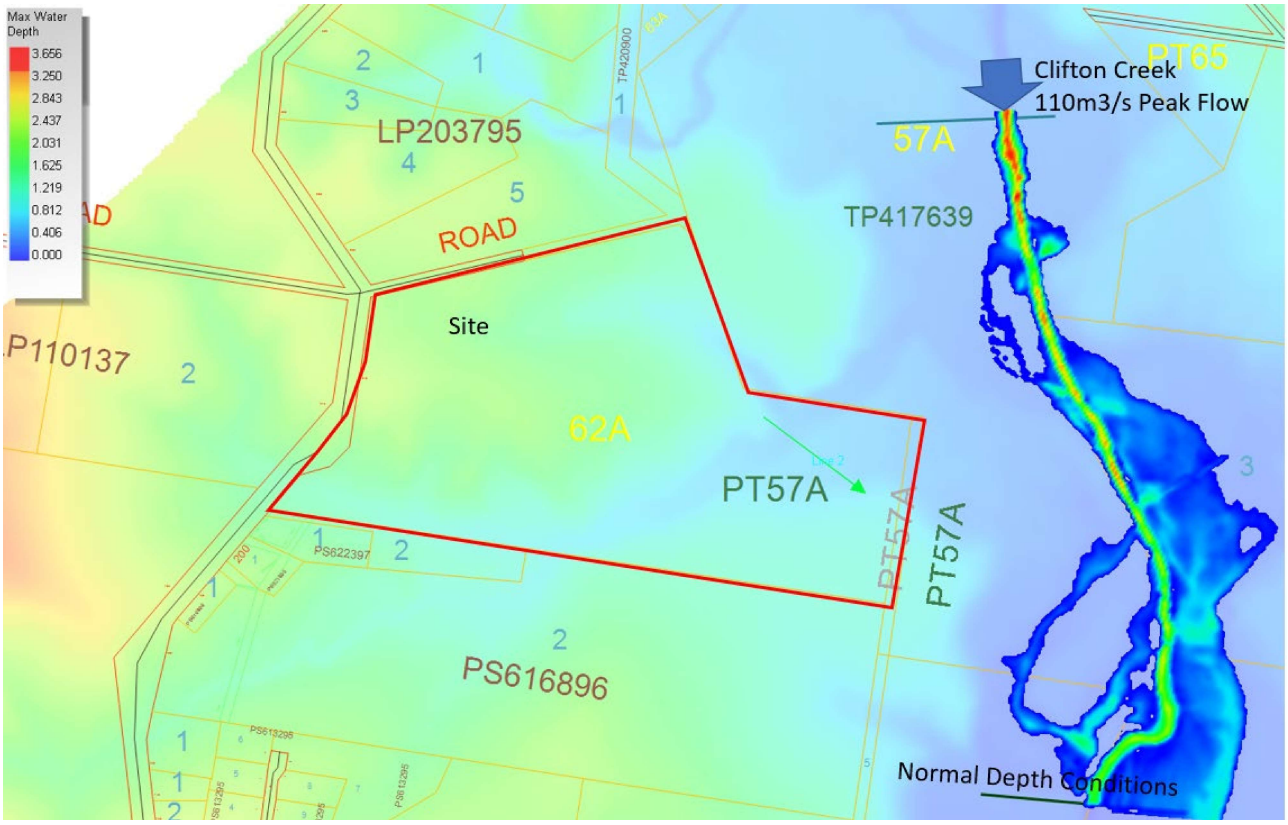

Figure 14: Clifton Creek 1% AEP

Figure 14 clearly shows that the subject site is not affected by the Clifton Creek peak flows, however further analysis will still consider the Clifton Creek 1% flows as worst case downstream conditions.

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7 Proposed Development

The proposed development is a low density rural living development of approximately 65 lots ranging from 4,000m2 up to 1.26ha in size.

A road system servicing the lots follows the site's ridge lines and transects the existing gully lines in two locations.

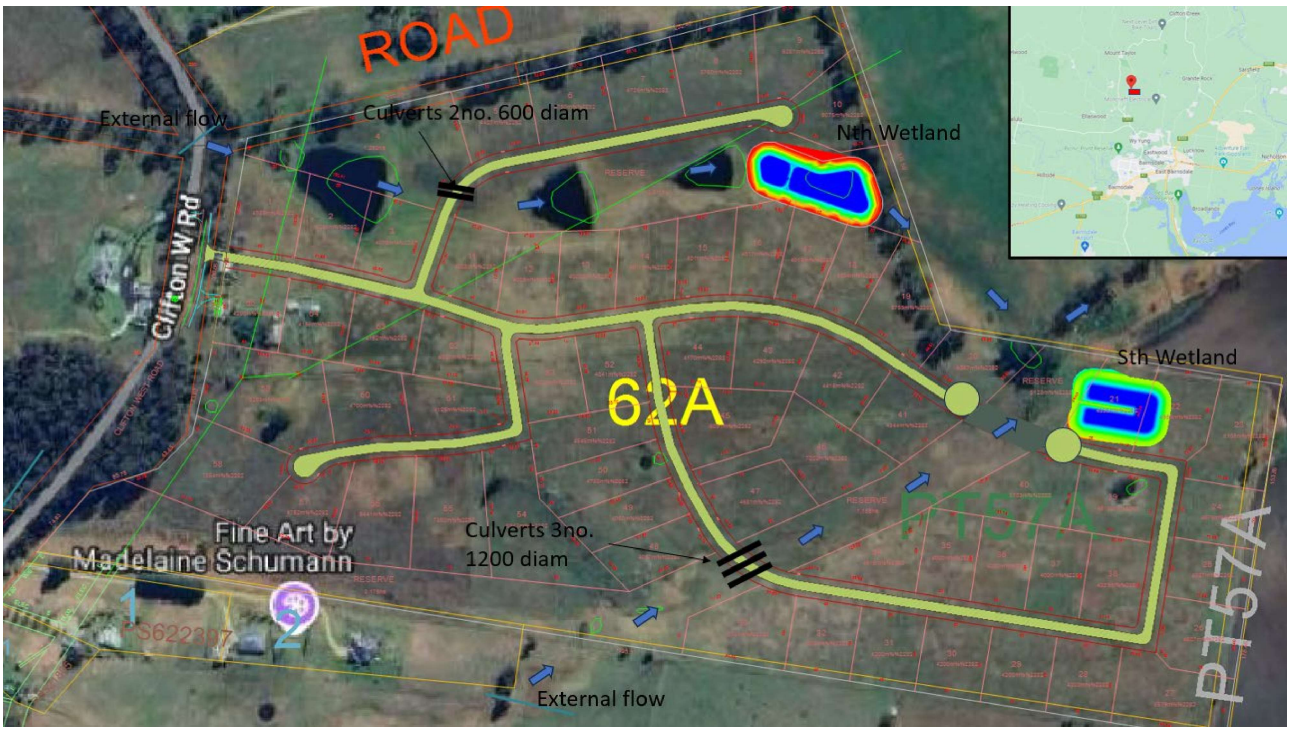

Figure 15: Developed Overall Site Concept

From a stormwater perspective, the developed site will remain relatively pervious with the main areas of hardstand being the roads, and house lot roof driveways.

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Analysis of the developed site assuming that each lot has a 500m2 impervious surface:

Clifton West Developed Catchment		
Total lot area	43.7	ha
Road area	1.76	ha
Lots	65	no.
Roof Area per lot	0.05	ha
Total roof area	3.25	ha
Water tank size per lot	10	m3
Tank capacity	650	m3
Reserve area nth	2.61	ha
Reserve area sth west	3.18	ha
Reserve area sth middle	1.56	ha
Reserve area sth end	0.51	ha
Fraction Impervious	**11%**	

A change in fraction impervious from 0% to 11% is predicted in the ultimate development.

7.1 Proposed Development Flow Strategy

It is proposed that the top three existing dams in the northern half of the site will be filled and a drainage easement/reserve be established to allow external flows to pass as per the existing condition. The main entrance road will follow the high ridge line and form the upper and lower catchment boundary.

In the northern part of the site, an easement will be established in Lot 4 to enable external flows to pass through to a new culvert and further into a Reserve easement before flows are treated in the northern wetland system.

In the southern part of the site, it is proposed that only 1 new crossing is provided between lots 33 and 48.

Drainage from the southern part of the site will fall to a new retarding basin/wetland between lots 20 and 21.

Some filling will be required in the lower lots to contain the 1% AEP flows to provide freeboard to the lots on the southern side of the site.

The northern wetland system will be online due to the limited external flow catchment and the southern wetland will be offline to protect the wetland from large external flows.

New wetlands will provide treatment for the road and impervious surfaces while also providing retardation back to pre-development levels.

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8 Water Quality Model

A continuous rainfall model for the site was prepared using MUSIC for the developed site to show how the site could further mitigate any outfall of stormwater compared to the existing conditions. The 6min long term rainfall record from Sarsfield was obtained and is closest to the site.

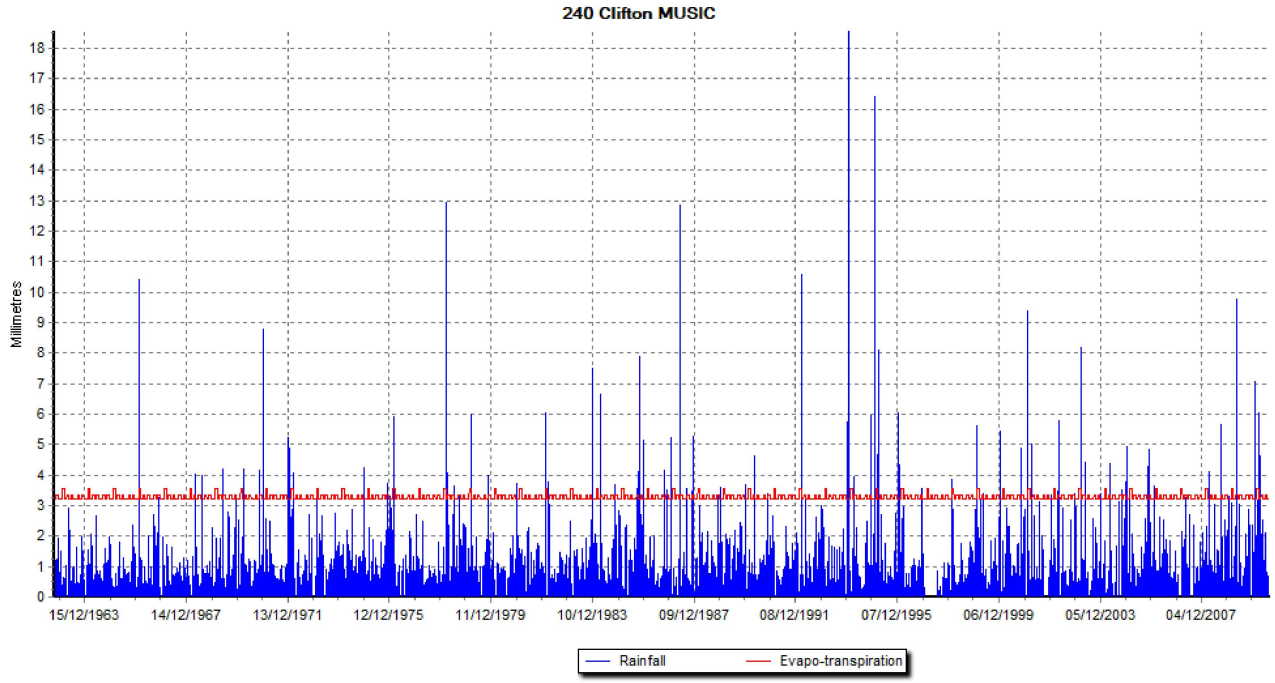

Figure 16: Rainfall Distribution

Total average rainfall and evaporation for the site:

	Rainfall/6 Minutes	Evapo-Transpiration
mean	0.008	3.288
median	0.000	3.226
maximum	18.550	3.571
minimum	0.000	3.226
10 percentile	0.000	3.226
90 percentile	0.000	3.333

	Rainfall	Evapo-Transpiration
mean annual	667	1201

Figure 17: Rainfall and Evaporation Summary

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8.1 Model configuration

The soil input parameters recommended here are based on a review of twelve catchment calibrations undertaken for Melbourne catchments in recent years.

Soil storage capacity = 120 mm,	Field capacity = 50 mm

Figure 18: MUSIC Model

A copy of the MUSIC model is provided with this report.

Key Input Parameters:

Roads = Modelled with 100% fraction impervious

Tanks = Assume a 4br house with 155 litres per person usage = 0.6kl per lot per day.

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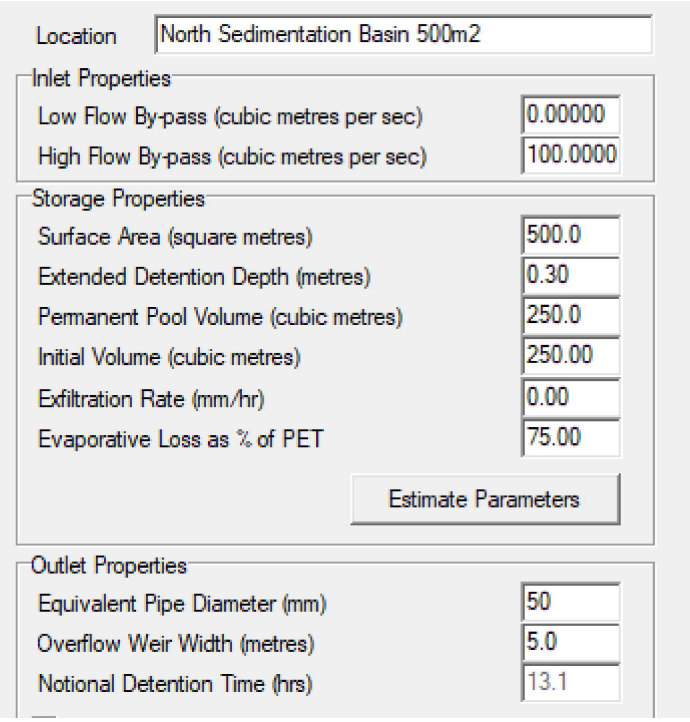
Sediment Basin Parameters:



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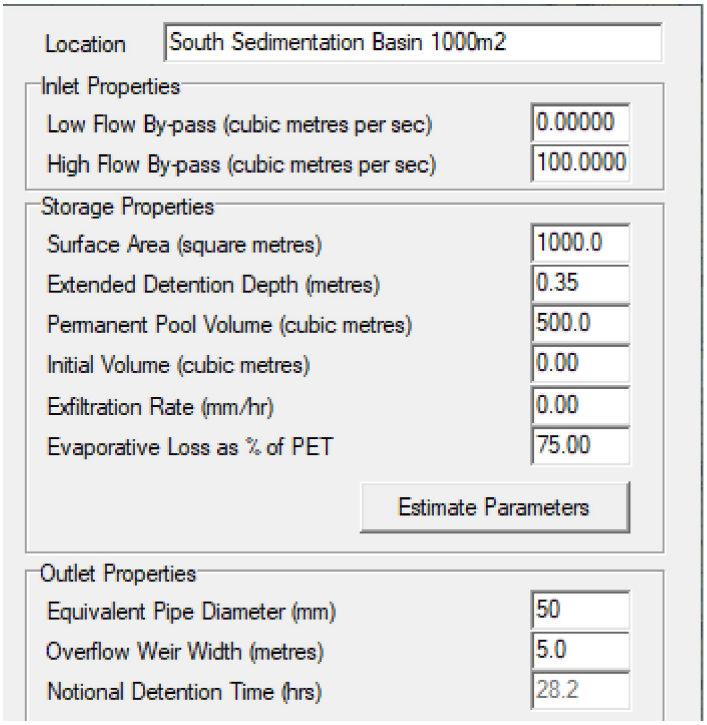
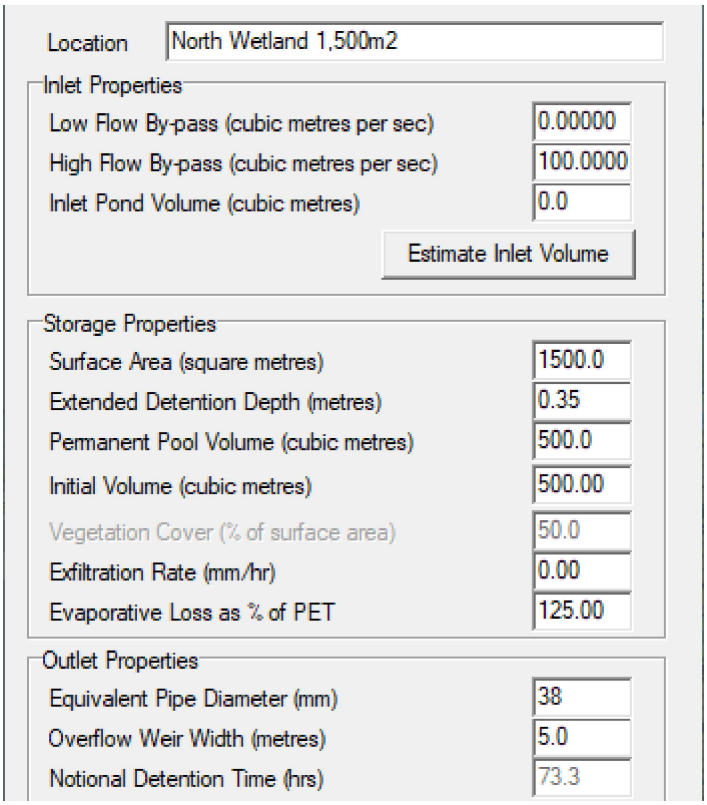


Wetland Parameters:



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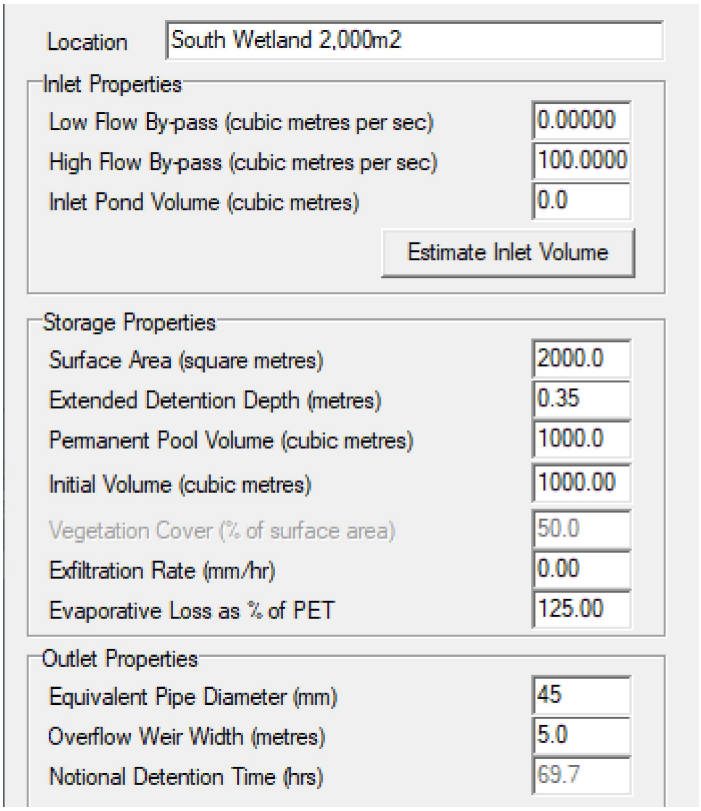

8.2 Water Quality Results

Overall, the WSUD treatment train effect of the proposed site exceeds Best Practice stormwater management guidelines.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	69.7	51.1	26.7
Total Suspended Solids (kg/yr)	7230	940	87
Total Phosphorus (kg/yr)	15.7	5.05	67.9
Total Nitrogen (kg/yr)	121	66.6	45.1
Gross Pollutants (kg/yr)	1480	0	100

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Comparison of the results with the Best Practice guidelines:

Parameter	Best Practice % removal standard	Modelled outcome % removal	Target Achieved
Total suspended solids	80	87	YES
Total Phosphorus	45	67.9	YES
Total Nitrogen	45	45.1	YES

All targets for water quality will be met and exceeded.

The northern portion of the site will be treated with a 500m2 sediment basin and 1,500m2 wetland while the southern portion will be treated with 1,000m2 sediment basin and 2,000m2 wetland.

In addition, the water tank use indicates a 27% reduction in volumetric outflow which is very positive.

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9 Hydraulic Design

A 2d model was developed in Tuflow to model the existing external peak flows calculated earlier and routing developed flows through the subject site with Clifton Creek at maximum flow rate as a worst-case scenario. It should be noted that that probability of the timing for peak flows for all catchments occurring at the same time is negligible.

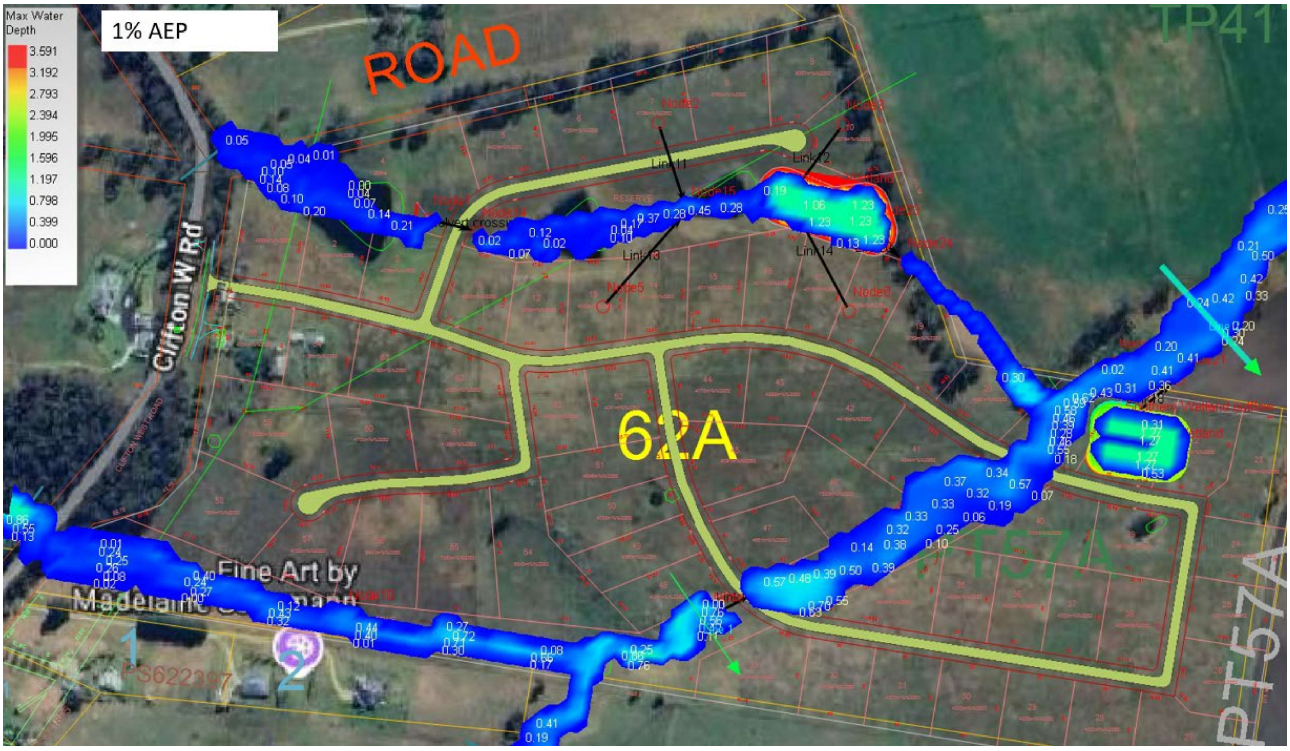

Figure 19: Peak 1% AEP Flow depth and extent

The main southern culverts between lots 33 and 48 are modelled as triple 1200mm diameter pipes that each can convey 5.72m3/s proving a total of 17.2m3/s.

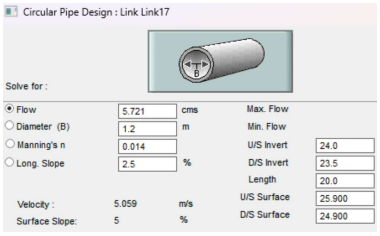

Figure 20 shows that the maximum flow through the triple culvert system is 16.8m3/s which have the capacity to meet the major flows from external catchments.

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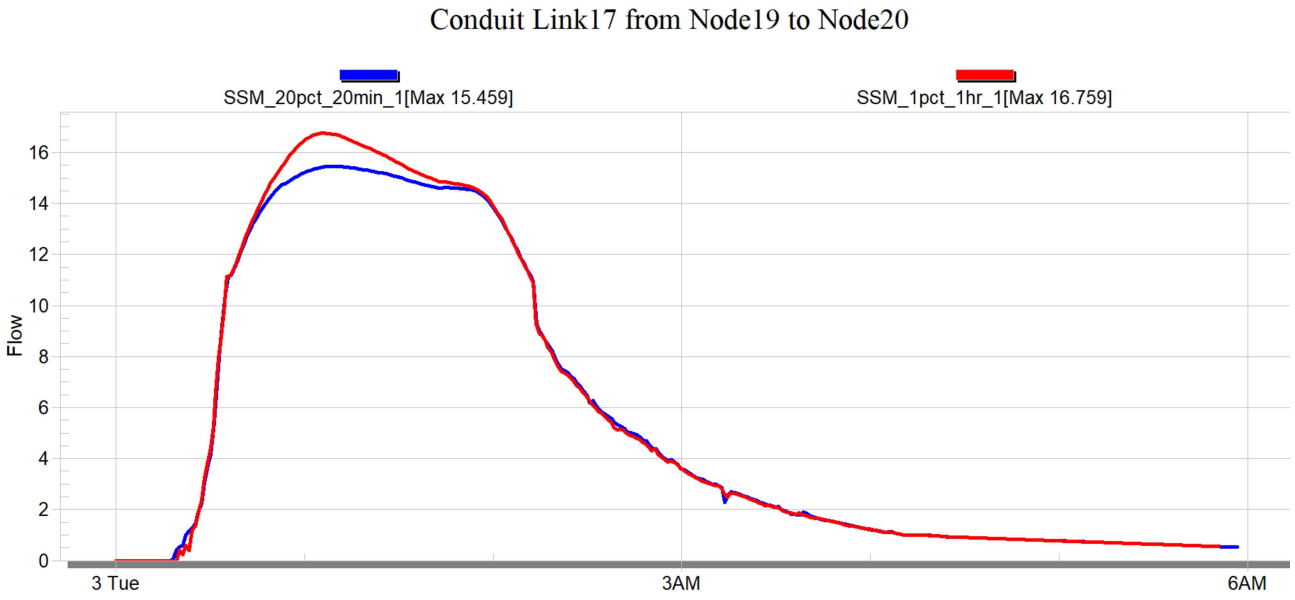
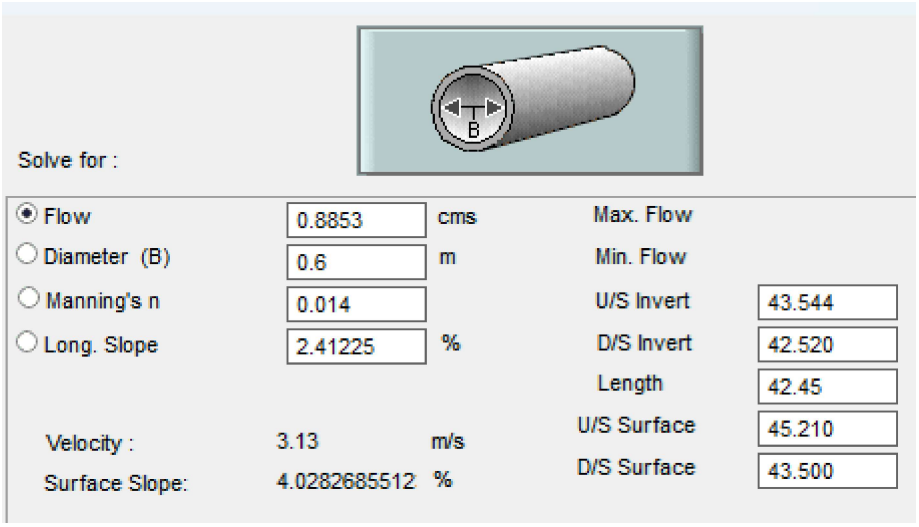


Figure 20: Peak 20% and 1% AEP Flows southern culvert

In the north, the proposed culvert system is a twin 600mm diameter pipe configuration which has a capacity of 1.77m3/s. The single pipe capacity calculation is shown below.



The model results show that a maximum of 1.705m3/s passes through the culvert system from the external 1% flows and the small number of lots upstream of the northern road culvert. Note that the 20% result for the culvert is dominated by the assumption that a 1% AEP external event occurs with the developed site's 20% AEP event.

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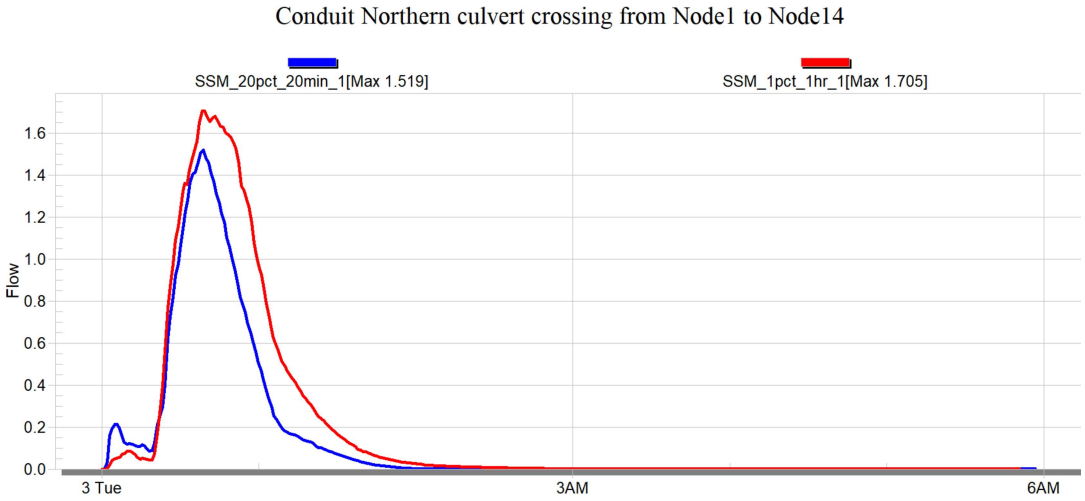

Figure 21: Peak 20% and 1% AEP Flows northern culvert

In combination, both proposed wetlands offer retardation of flow from the development.

To demonstrate the combined developed outflow, a flow line was added downstream of the site shown in Figure 22.

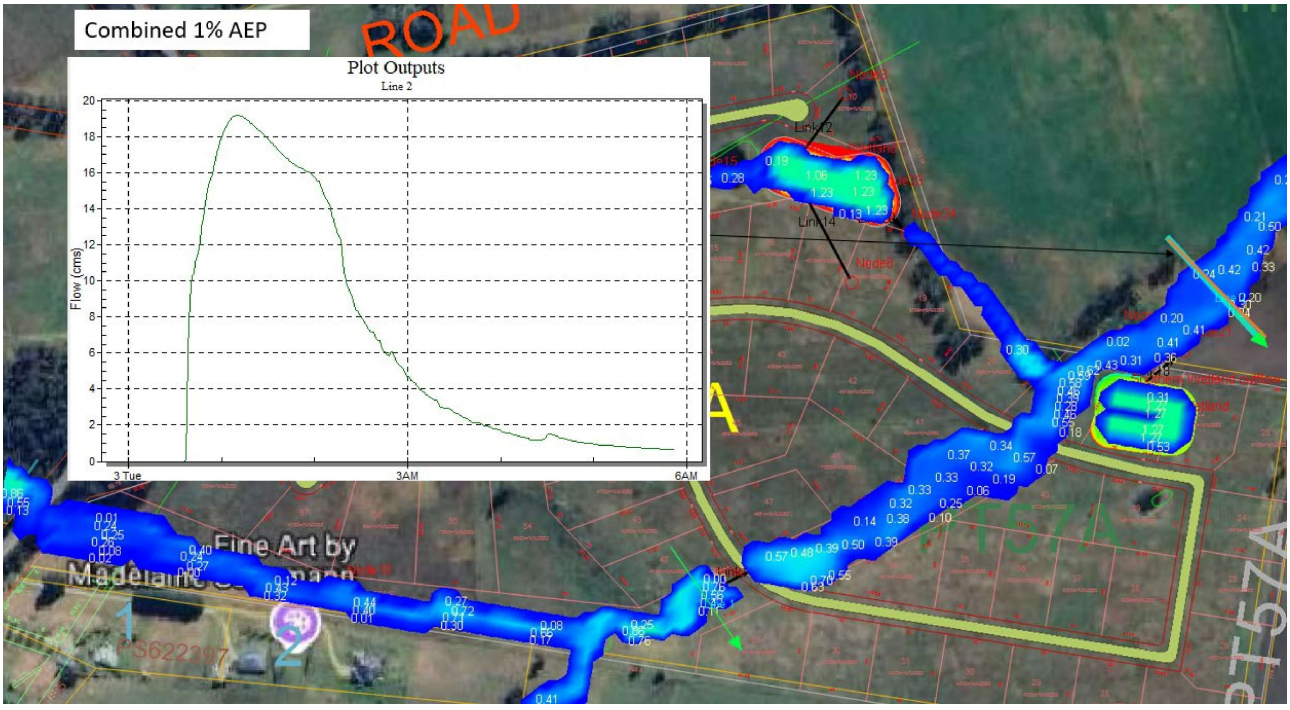

Figure 22: Peak 1% AEP Developed Flows

The combined retarded outflow for the 1% AEP is 19.17m3/s compared with the existing combined outflow of 20.5m3/s from Figure 11.

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The reduced peak flow that the development provides has an overall positive impact on inflow flow rate into the Clifton Creek downstream by reducing peak flows by 2.1m3/s.

9.1 Southern Wetland Hydraulics

A multi-link was used to model the southern wetland hydraulics.

The outlet link represents:

- 50mm low flow pipe to drain the wetland from EDD to NTWL. Invert set at RL 20.0m AHD.
- 750mm outlet pipe with invert at RL 20.3m AHD
- 5m wide high flow weir with crest at 21.8m AHD for emergency overflow

Outflow from the southern wetland peaks at 1.67m3/s for the southern portion of the site in the 1% AEP and only a minor outflow is recorded for the 20% AEP as the model assumes that the wetland is at NTWL level of RL 20.0m AHD when the storm event occurs and retardation will occur within the EDD zone between RL 20.0m AHD and 20.3m AHD while the wetland orifice (50mm diameter) begins to drain.

After water exceeds RL 20.3m AHD, the larger 750mm diameter pipe is engaged.

No high flows were recorded for the emergency weir in the simulation.

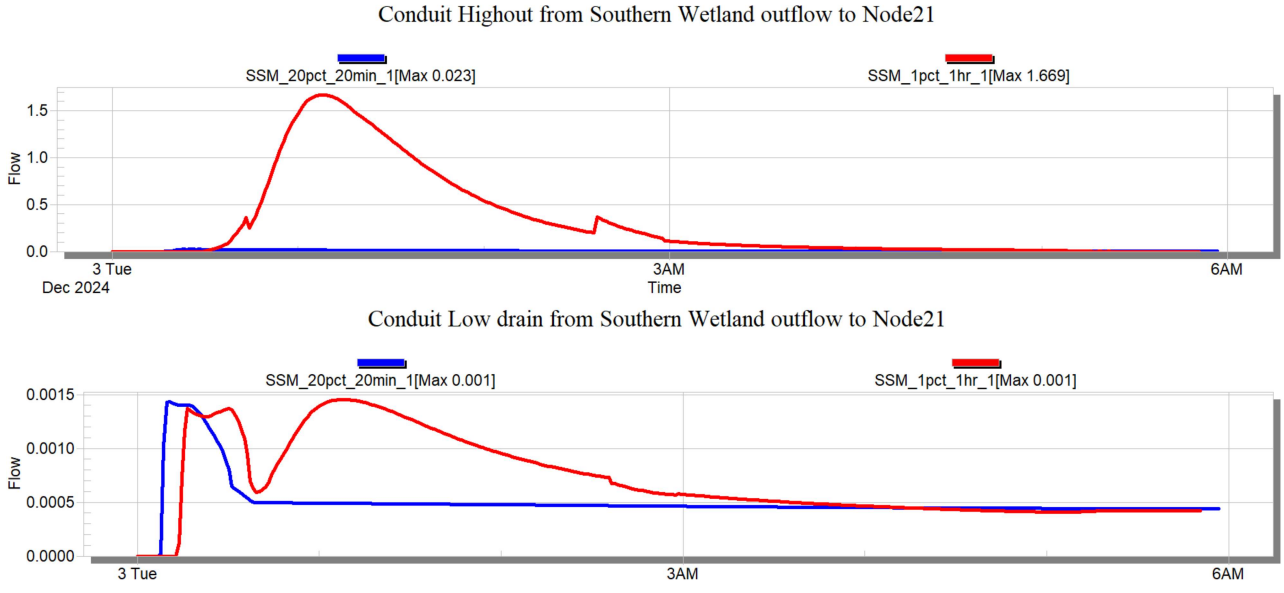

Figure 23: Southern Wetland Outflows

Outflow between NTWL 20.0m AHD and the EDD of 20.30m AHD occurs over an extended period according to the parameters of the MUSIC model and could be ignored in the stormwater hydraulic model.

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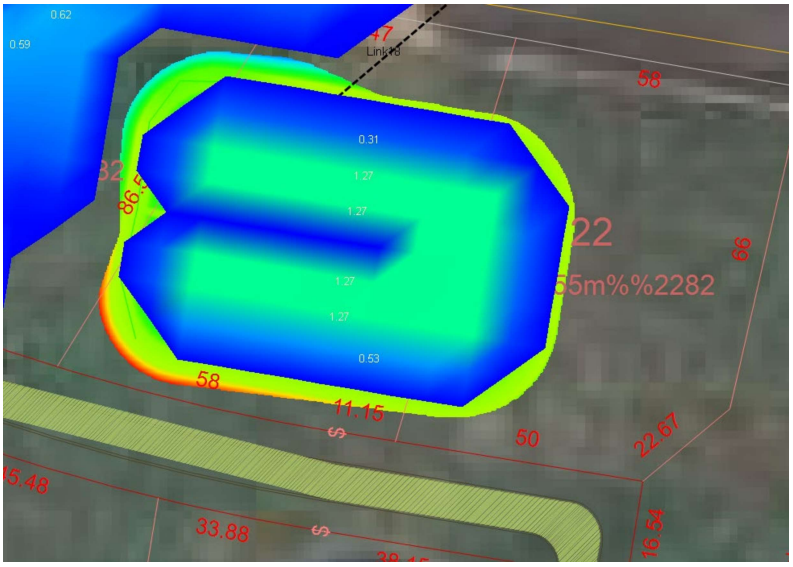

Figure 24: 1% Southern Wetland Depths

Depth reaches a maximum of 1.27m for the 1% AEP event which is derived from the southern site only.

The 20% event depth within the wetland reaches 0.35m which is essentially fills the extended detention depth of the wetland and results in minimal outflow from the higher level outlet pipe set at RL 20.3m AHD.

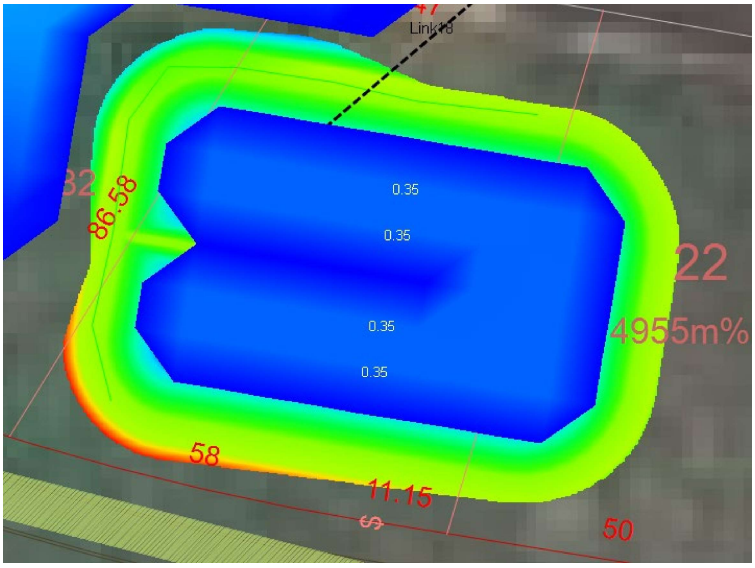

Figure 25: 20% Southern Wetland Depths

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9.2 Northern Wetland Hydraulics

A multi-link was used to model the northern wetland hydraulics.

The outlet link represents:

- 50mm low flow pipe to drain the wetland from EDD to NTWL. Invert set at RL 28.5m AHD.
- 750mm outlet pipe with invert at RL 28.85m AHD
- 5m wide high flow weir with crest at 30.0m AHD for emergency overflow

The online sedimentation basin / wetland to the north receives modest flows in the peak events as well as all small events to maintain the wetlands water regime.

The wetland sizing was provided by MUSIC with a sediment basin area of 500m2 at NTWL and a wetland total surface area of 1,500m2 macrophyte area.

NTWL of 28.50m AHD.

EDD 28.85m AHD.

Wetland EDD draining will be via small orifice holes specified in the MUSIC model to drain out over approximately 73hours.

The storm hydraulics component considers the airspace above EDD for retardation as a worst case scenario.

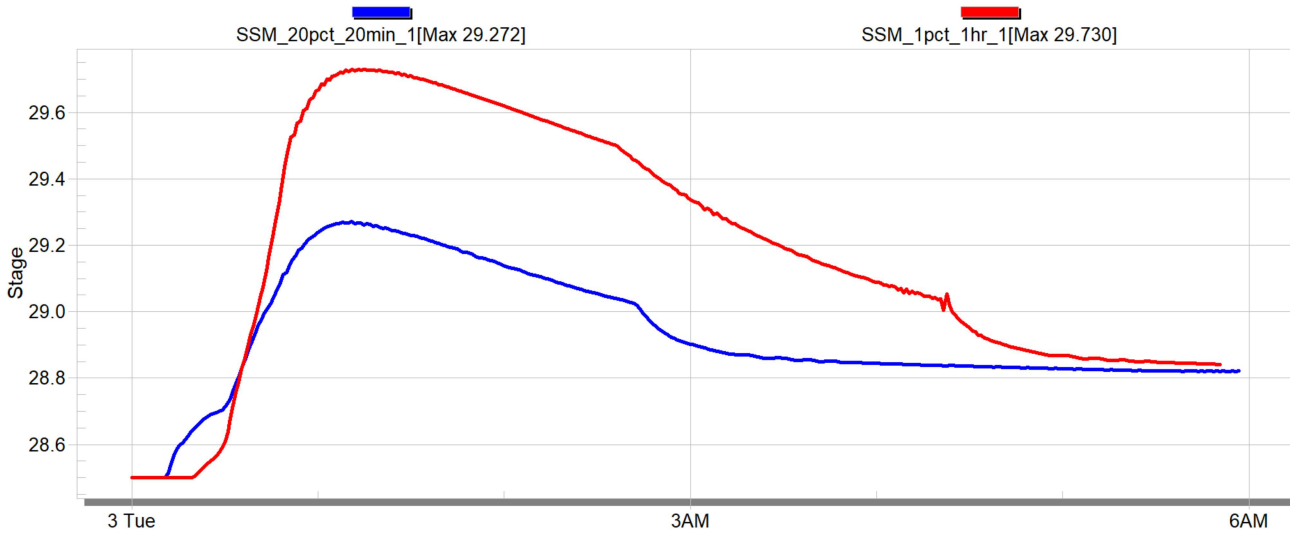

Figure 26: Northern Wetland Depth v Time

The high flow weir was not engaged in the simulations and all flow is controlled via pipe flow.

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The northern wetland reaches a maximum depth of 1.23m in the 1% AEP event as shown in Figure 26.

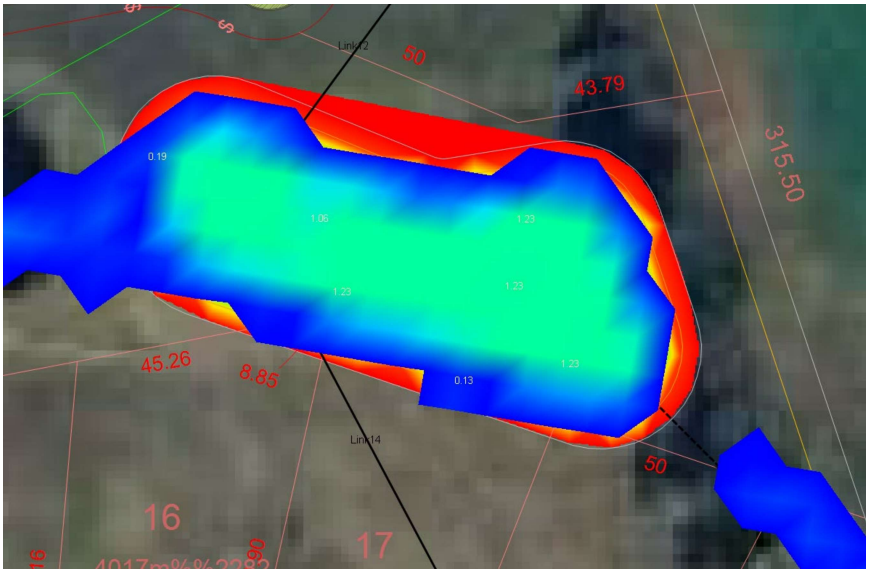

Figure 27: Northern Wetland 1% AEP Depth

For the 20% AEP plus the external 1% AEP event, the northern wetland reaches 0.77m in depth.

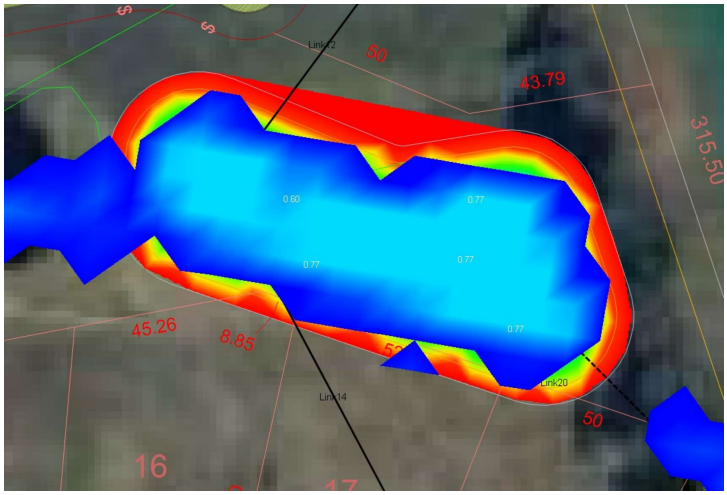

Figure 28: Northern Wetland 20% AEP Depth

Discharge to the downstream waterway is within the subject site immediately downstream of the northern wetland and then joins the southern wetland flows at the confluence in the neighbouring property.

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10 Flow Velocities

A velocity plot was developed to show areas of potential scour where the velocity exceeds 0.7m/2 generally considered to be the threshold for sediment transport.

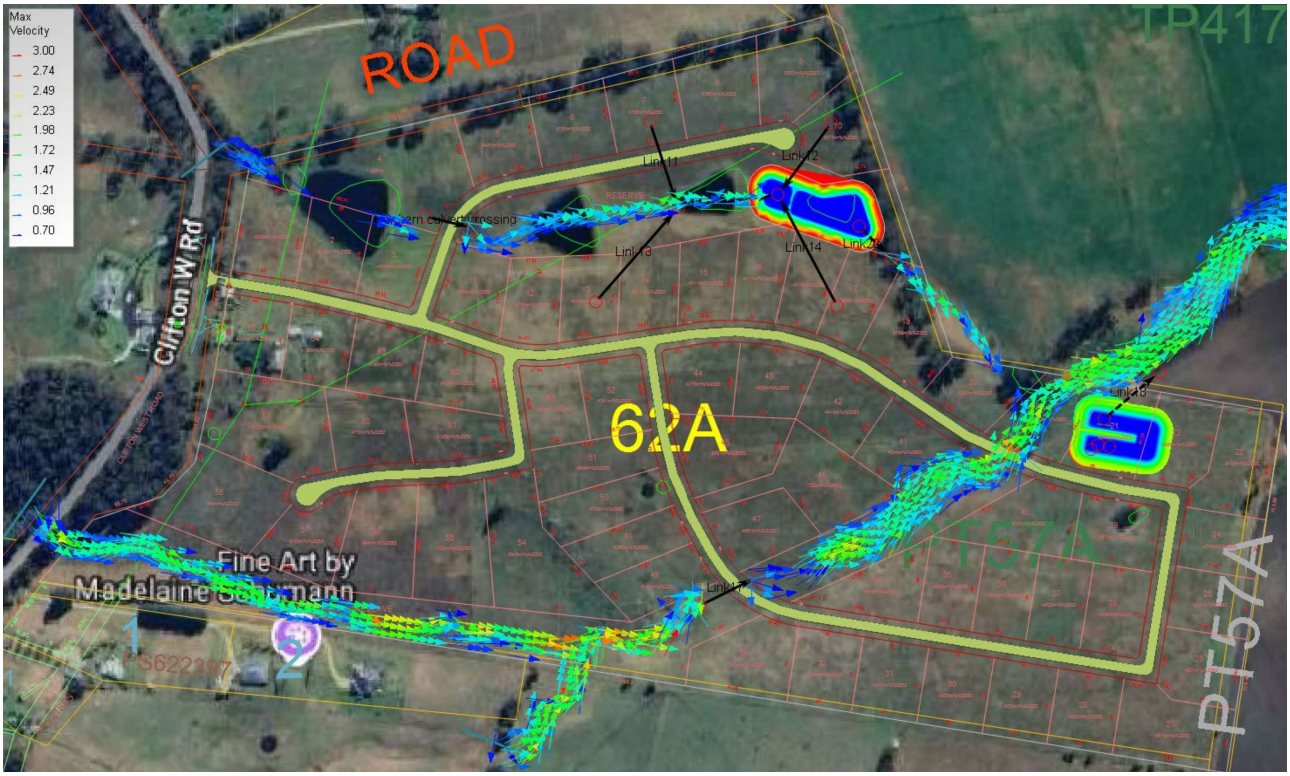

Figure 29: Velocity Profile

Figure 29 shows that there are no velocities greater than 0.7m/2 within the basins, however given the potentially large external flows, areas of confluence along the southern boundary and culvert crossings will require rock beaching to mitigate the scour effects in the major events.

Velocity within the northern reserve can be managed with a wider flow path to control velocity or provide rock beaching of the pilot channel.

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11 Recommendations

Based on the hydraulic and water quality analysis of the proposed development, consideration of the current topography and proposed measures to implement water sensitive urban design we recommend:

- Due to topography, all flows cannot be treated with one wetland/retarding basin (WLRB) and hence, construction of two wetland/retarding basins to control the flows from two main catchment flow paths is necessary;
- Two main road culvert systems be provided to safely convey external and internal flows through the northern and southern catchments;
- The northern WLRB to be online and the southern WLRB to be offline due to it's large catchment upstream;
- Sizing of treatment and retarding facilities are based on low density development not exceeding 11% change in overall fraction impervious including roads;
- Tank water reuse is encouraged at the lot scale to manage volumetric excess runoff;

Implementation of the stormwater strategy outlined in this report will manage stormwater to Best Practice standards and have a positive effect on downstream flow as a consequence.

Marc Noyce

Director – Noyce Environmental Pty Ltd.

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Waterway Management Plan

Multi Lot Subdivision (Staged) & Works (Roadworks)
240 Clifton West Road, Mount Taylor

Reference – 19502

June 2025

1. Introduction

This Waterway Management Plan (WMP) has been prepared to support a Planning Application for Multi Lot Subdivision (Staged) & Works (Roadworks) at 240 Clifton West Road, Mount Taylor.

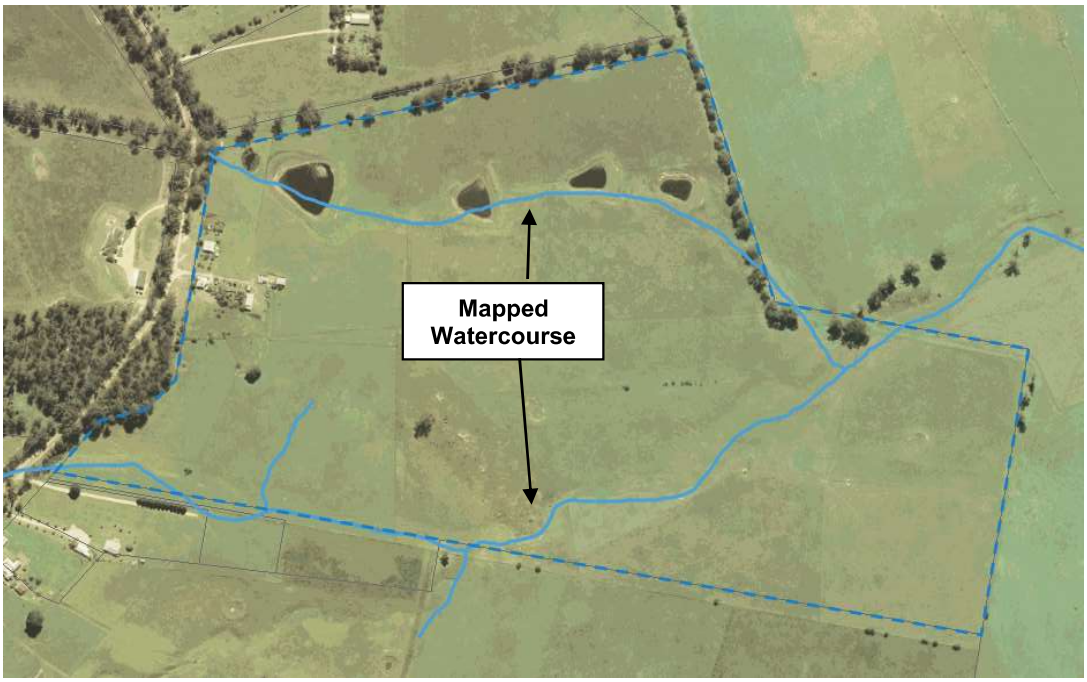
It is anticipated that this WMP will be endorsed as part of a Planning Permit ensuring compliance with the management and maintenance obligations contained herein.

The prescribed management actions and works detailed within this plan are specific to the series of Reserves which are being created as part of the subdivision. Upon completion of the necessary works by the Developer the Reserves will vest with Council who will be responsible for their long-term management and maintenance.

This WMP is not intended to burden any residential allotments being created as part of the subdivision. Whilst a number of residential allotments will be established within 30.0 metres of a designated watercourse, Building Exclusion Zones will form a restriction of the Formal Plan of Subdivision. This will provide adequate protection to the waterway and negate the need for these allotments to be burdened by the WMP.

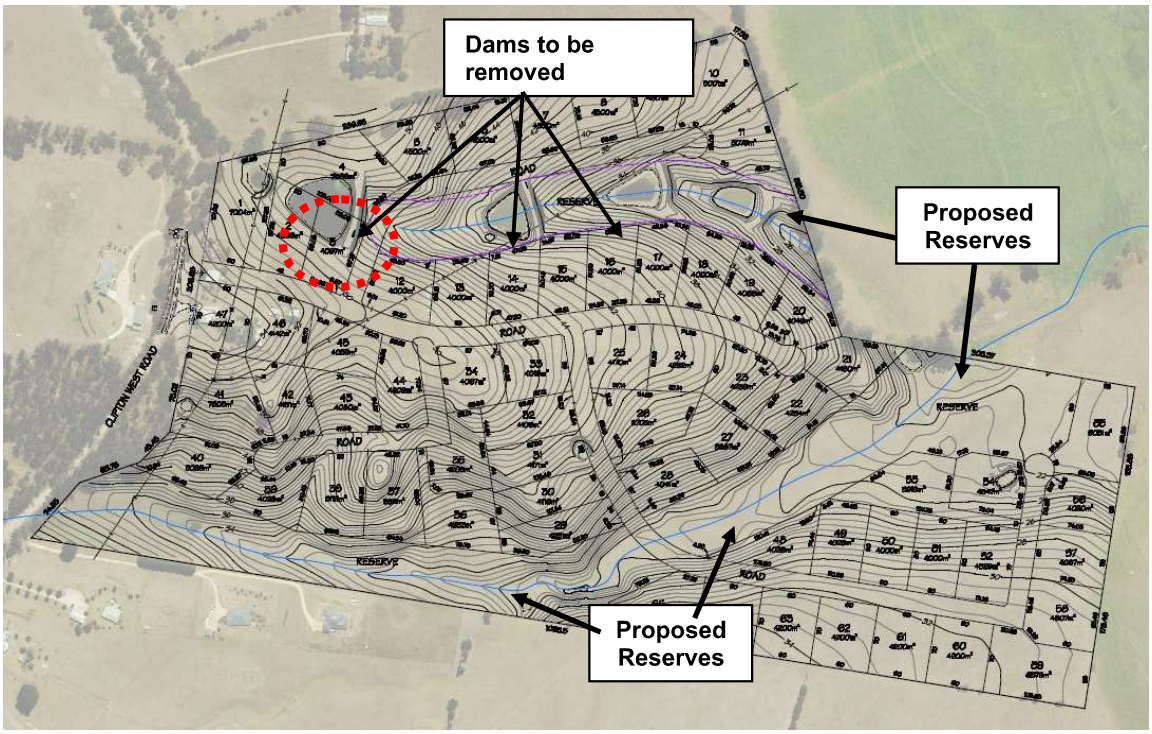
2. Site Analysis

The subject land is formally described as TP278078 and is approximately 43.22ha in area. It has historically been utilised for grazing purposes and is dissected by a watercourse which traverses both the northern and the southern portions of the site generally in an east west direction.



Aerial view of subject land with mapped watercourse – Source: VicPlan

The subdivision layout nominates the creation of a large reserve system which will encompass the majority of the natural drainage network as dissecting the site. Existing dams that are not required for detention of treatment of stormwater will be decommissioned..



Proposed Subdivision Layout

A larger dam located on the north-western corner of the site within proposed Lots 2, 3 and 4 will be removed as part of the proposal which is considered appropriate given its location at the head of the waterway and proximity to residential use.

The existing watercourse forms part of the wider catchment and is important for the ongoing health and integrity of the waterway system. This designated waterway does not hold water permanently however does provide a natural drainage function. Whilst it has good grass coverage, it is predominantly covered by non-native pastoral species.

Looking in a south westerly direction of the existing watercourse

The site has a rolling hills landform and displays good grass coverage with low to moderate changes in elevation. The steepest section of the site is approximately 1:5 and whilst the land has been utilised for grazing purposes there is currently no evidence of erosion.

Looking in a westerly direction towards the watercourse dissecting the southern portion of the subject land

3. Management & Maintenance

The objective of this Plan is to protect and manage the waterway/drainage systems within the proposed Reserves to ensure land use change will not have any detrimental environmental impacts on water quality or flow.

To adequately protect and manage the waterway/drainage system the Developers and Council are to undertake the following actions to ensure the objective is met:

- Comply with WMP at all times
- Abide by the exclusion zone
  (no buildings, wastewater treatment or stock)
- Revegetate the inner zone and outer zone areas consistent with the WMP
- Undertake regular monitoring of the waterway and maintain as required
- Control and manage weed species
- Maintain continued free passage of drainage
- Protect and maintain water quality and environmental values

The parties responsible for implementing the WMP are also encouraged to liaise with the East Gippsland Catchment Management Authority if there is any significant change that results in the integrity of the waterway being compromised.

3.1 Sequencing of Management Actions

MANAGEMENT GOALS		
Short Term **Developer Responsibility** 0 – Certificate of Practical Completion of Works	**Medium Term** **Developer Responsibility** 24 months following the issue of Practical Completion of Works	**Long Term** **Landowner (Municipal Council)** Completion of 24 month maintenance period onwards
Establish Exclusion Zone Fencing of Reserves Weed Management Undertake revegetation work Watering Replace dead/diseased plants	Maintain Exclusion Zone Ongoing weed management Replace dead/diseased plants to meet target success rate of 80% Overstorey foliage cover to remain <10% Monitoring	Maintain Exclusion Zone Ongoing weed management Overstorey foliage cover to remain <10% Monitoring

Note: Number of plants to be established for 80% success rate is provided on page 10

The management actions associated with the WMP will need to be undertaken having regard for the staged manner of the subdivision. The Reserve on the northern portion of the site will be created ahead of the remaining sections will be created as part of Stage 4.

3.2 Management Actions

The following management actions will need to be undertaken within the Reserve system consistent with the short, medium and long term management goals to ensure the waterway system is enhanced and the risk of degradation is reduced.

3.2.1 Exclusion Zones

It is considered necessary to exclude buildings, wastewater treatment facilities and stock from within 30.0 metres of the designated watercourse to ensure the health and integrity of the waterway is not compromised.

The Plan shows a 30.0 metre buffer either side of the watercourse which encompasses most of the Reserve system and dissects a number of residential allotments.

The land within the 30.0 metre buffer forms the Exclusion Zone for which no buildings or wastewater treatment can occur, and no stock can be provided.

Given the Reserves will ultimately vest with Council and will continue to provide a drainage function enhanced through extensive revegetation work, the exclusion zone requirements will be easily upheld. The Reservation status will prevent establishment of residential development and associated wastewater treatment in these areas and stock will naturally be excluded given the site context.

The simple action of removing stock from the area will dramatically enhance the water quality as it will reduce the risk of erosion, deposition of soils and pollutants from stock waste.

The allotments identified as containing land within 30.0 metres of the watercourse have each been provided with Building Exclusion Zones which will be registered as a restriction on the Plan of Subdivision.

The Building Exclusion Zone will ensure that future residential development is setback appropriately from the watercourse, so it does not impede its health. It will also negate the need for any residential allotments to be bound by this WMP.

Exclusion Zones	
Significant Disturbance/Earthworks	No earthworks or other significant disturbance activities are to occur within the exclusion zones, unless associated with protection and enhancement of the environmental qualities of the waterways, and only with prior written approval from the *East Gippsland Catchment Management Authority*.
Minor Works	Minor works such as enhancement planting and weed management are acceptable activities that can be undertaken within the exclusion zone areas in accordance with the WMP or otherwise as approved in writing by the *East Gippsland Catchment Management Authority.*

Any works within 20 metres of the designated waterway as defined under Section 188 of the *Water Act 1989* require a Works on Waterways Permit from the *East Gippsland Catchment Management Authority* under the *Water Act 1989* before any activity commences.

3.2.2 Weed Control

The waterway and associated Exclusion Zone are currently well covered with pastural grasses and are not currently being adversely impacted by any significant weed species.

As part of the revegetation work the non-native grasses covering the revegetation areas will need to be removed. These grasses are currently aiding in binding the soil and reducing the erosion hazard so careful consideration will need to be taken to ensure the revegetation works occur soon after the pastoral grasses are removed.

The introduction of residential development on adjoining land has the potential to accelerate the introduction and dispersal of weed species and it is therefore important to undertake monitoring of the area and act as appropriate to ensure weed species do not establish within the waterway buffer.

The ongoing monitoring and maintenance of weed species should be easily achieved and not pose a burden in the long term as the revegetation planting will have established thereby reducing weed competition.

3.2.3 Revegetation

To enhance the quality of the existing watercourse and to reduce sediment and nutrients from entering the waterway system an element of revegetation work will be undertaken along the watercourse as shown on the accompanying Plan.

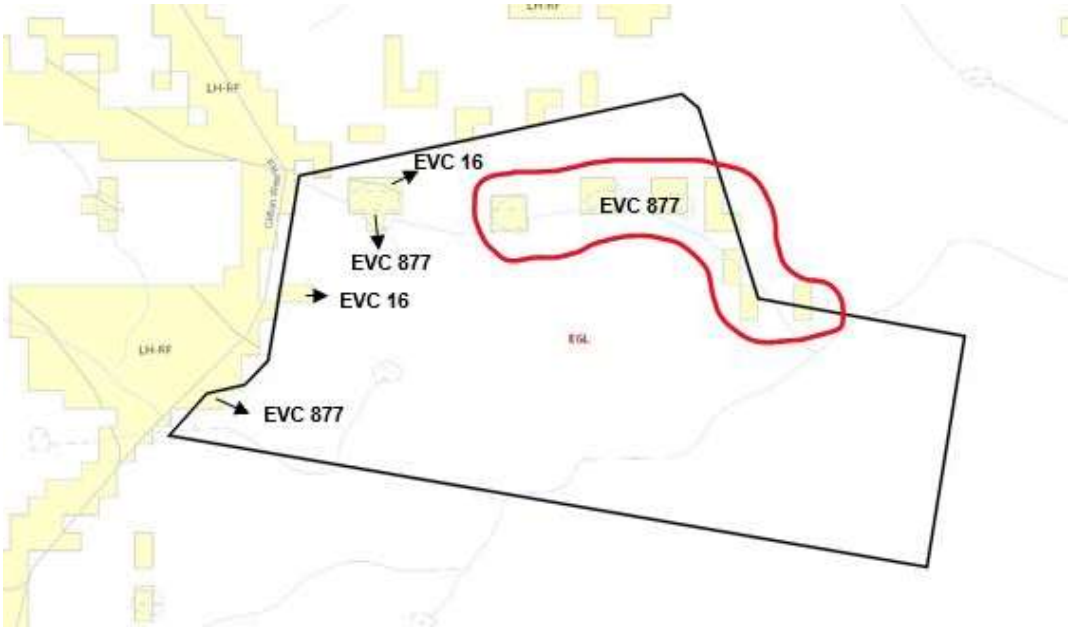
The revegetation work will be confined to the proposed Reserve system which has been designed to correspond generally with the location of the existing waterway.

An inner buffer of 10.0 metres either side of the watercourse will be revegetated with denser plantings of 4 plants per square metre to minimise erosion risk and long term maintenance. An outer revegetation buffer of varying width will comprise 2 plants per square metre.

The width of the outer buffer varies slightly to ensure that there is adequate grassed area available adjacent to the boundaries of the Reserve for a lawn mower to make a return trip for maintenance purposes and to accommodate services and drainage infrastructure.

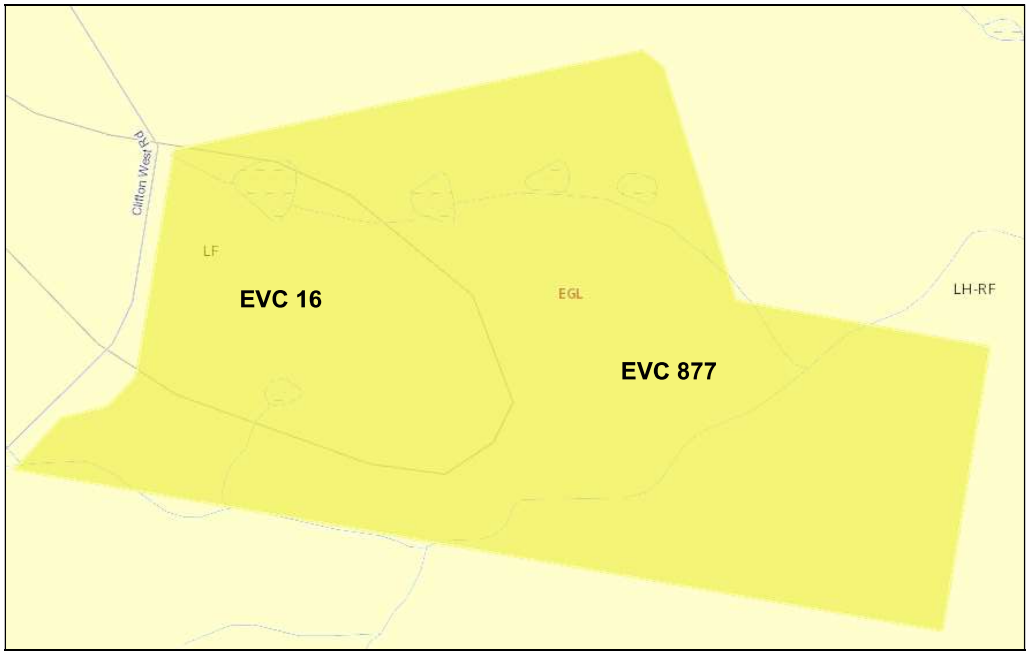
Given the future residential context of the area, careful consideration has been given to the style and extent of revegetation to ensure a balance is provided between the residential use and environmental values and constraints.

Ecological Vegetation Class (EVC) mapping from 2005 identifies that small sections of the site represent either EVC 877: Lowland Herb-rich Forest or EVC 16: Lowland Forest of the East Gippsland Lowlands Bioregion.



2005 EVC Mapping – Source: Nature Kit

The EVC mapping for pre 1750 shows that the western portion of the site contained EVC 16: Lowland Forest whilst the remainder of the property comprised EVC 877: Lowland Herb-rich Forest of the East Gippsland Lowlands Bioregion.



Pre 1750 EVC Mapping – Source: Nature Kit

The revegetation work will need to be more representative of a 'Grassland' rather than 'Forest' under Australia Standard AS3959:2018, *Construction of building in bushfire prone areas* to ensure future residential development on adjoining allotments is not exposed to a severe bushfire hazard.

It is therefore necessary revegetation includes a high concentration of grassy and understorey species with only limited scattered overstorey species resulting in less than 10% canopy foliage cover. Whilst the species composition will be more representative of a grassland, the species to be selected are to be representative of both EVC 16: Lowland Forest & EVC 877: Lowland Herb-rich Forest to resemble the naturally occurring vegetation type.

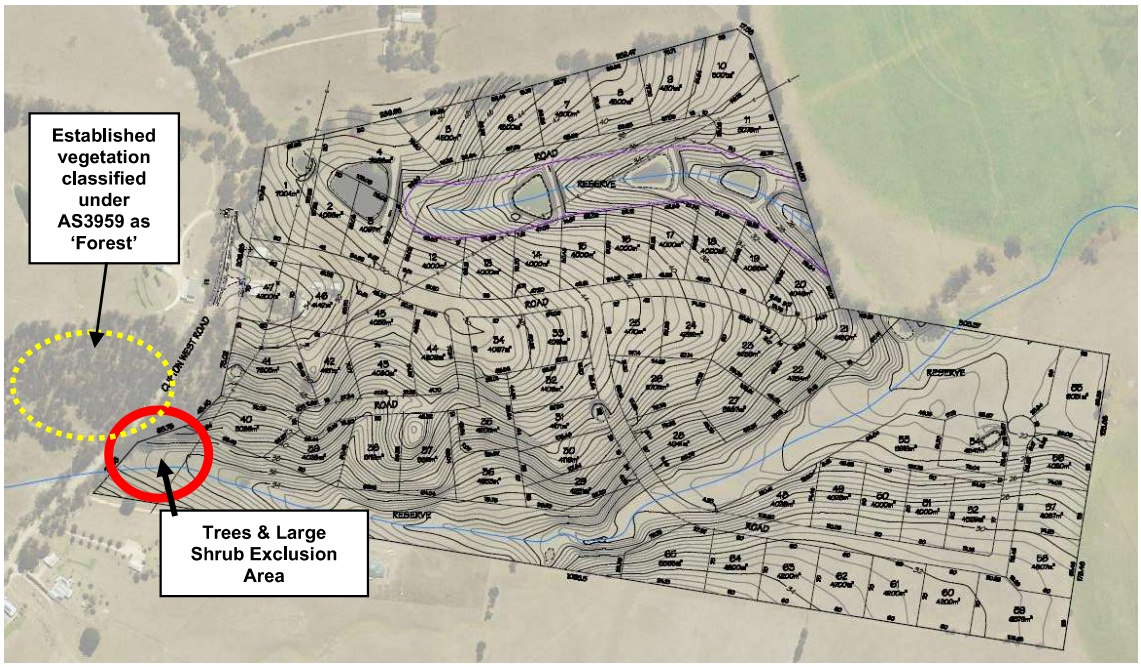
The Appendices to this Report provide examples of suitable species to be utilised as part of the revegetation work which are representative of the applicable Ecological Vegetation Classes. Whilst use of species from this list is encouraged, species selection will be dependant upon availability. Other trees and groundcovers can form part of the revegetation work however they must be native to Victoria.

The following tables provide a break down on how the planting density and overall plant numbers have been derived for the revegetation work to be undertaken within the various sections of the Reserve system.

Reserve No. 1 (3.179ha)	10m Inner Zone	Outer Zone
Revegetation Area (ha)	1.11ha	0.697ha
Revegetation Area (m²)	11,100m²	6970m²
Number of Trees / Large Shrubs to be planted	16	0
Number of Trees / Large Shrubs to be established for 80% success rate	13	0
Planting Density for Groundcovers	4/m²	2/m²
Number of Groundcovers to be Planted	44,400	13,940
Number of Groundcovers to be established for 80% success rate	35,520	11,152
Reserve No. 2 (1.55ha)	**10m Inner Zone**	**Outer Zone**
Revegetation Area (ha)	0.42ha	0.174ha
Revegetation Area (m²)	4200m²	1740m²
Number of Trees / Large Shrubs to be planted	9	0
Number of Trees / Large Shrubs to be established for 80% success rate	7	0
Planting Density for Groundcovers	4/m²	2/m²
Number of Groundcovers to be Planted	16,800	3,480
Number of Groundcovers to be established for 80% success rate	13,440	2,784
Reserve No. 3 (5123m²)	**10m Inner Zone**	**Outer Zone**
Revegetation Area (ha)	0.126ha	0.131ha
Revegetation Area (m²)	1260m²	1310m²
Number of Trees / Large Shrubs to be planted	4	0
Number of Trees / Large Shrubs to be established for 80% success rate	3	0
Planting Density for Groundcovers	4/m²	2/m²
Number of Groundcovers to be Planted	5,040	2620
Number of Groundcovers to be established for 80% success rate	4,032	2,096
Reserve No. 4 (2.611ha)	**10m Inner Zone**	**Outer Zone**
Revegetation Area (ha)	0.53ha	0.758ha
Revegetation Area (m²)	4300m²	7580m²
Number of Trees / Large Shrubs to be planted	15	0
Number of Trees / Large Shrubs to be established for 80% success rate	12	XX
Planting Density for Groundcovers	4/m²	2/m²
Number of Groundcovers to be Planted	17,200	15,160
Number of Groundcovers to be established for 80% success rate	13,760	12,128

Whilst trees / large shrubs are required to be planted within the revegetation area, careful consideration will need to be given when spacing them out to ensure that the overstorey foliage cover remains less than 10%.

The planting of trees / large shrubs is to be excluded from the revegetation area to the west of the overhead powerline easement within Reserve 1. The purpose is to prevent the occurrence of a fire hazard which connects the revegetation with the established vegetation on the western side of Clifton West Road.



Proposed Subdivision Layout

Revegetation	
Action	**Requirements**
Timing	The work to be undertaken within the Reserve areas including revegetation will be undertaken in a staged manner as Reserve No 4 (2.611ha) will be created as part of Stage 2 and the remainder of the Reserves (Reserves No's 1, 2 & 3) will be created as part of Stage 3. The revegetation work is to be undertaken in the short term by the Developer before the issue of a Certificate for Practical Completion of Works. Best months for revegetation of tube stock are typically between June and early September. In the event conditions are not satisfactory or unforeseen circumstances occur which prevent the revegetation work from occurring within this timeframe, the landowner must liaise with the *East Gippsland Catchment Management Authority* to ensure an acceptable outcome is achieved.
Removal of pastoral grasses	Given the nature of the pastoral grasses it is expected that they will best be removed by application of herbicide and / or by machinery.
Plant Selection	It is preferable that tube stock be utilised for revegetation planting over seeding, as it typically results in a higher success rate. There is also the option to utilise more established plants, if desired.
Planting Method	Excavate a hole which is sufficient in size to accommodate root balls of the plants plus topsoil backfill. All weeds and other vegetation should be cleared within a 300mm radius of the planting.
Placing Method	Minimal disturbance should be given to root ball when removing the plant from the container. The root ball should be moist and placed in the centre of the hole then the topsoil should be backfilled.
Fertilising pellets	Place fertiliser pellets (slow release) around plants at the time of planting.
Backfilling	Backfilling should be undertaken with the topsoil and then lightly watered to eliminate air pockets. Careful consideration should be given to ensure topsoil is not placed over the top of the root ball, ensuring that the stem of the plant remains the same height above ground as it was in the container.
Watering Timing	Thoroughly water the plants before undertaking the revegetation work then again immediately after planting. Further watering will then need to be undertaken on a needs basis to maintain sufficient rate of growth.
Weed Management	Management actions will need to be undertaken to ensure that weeds are supressed. This could be undertaken in a number of ways however could be achieved through the use of geotextile weed matting or mulching for example.
Tree guards	Tree guards should be used in the event grazing animals (ie. rabbits) are problematic within the area, otherwise they are unnecessary.
Monitoring	Once the revegetation work has been completed it should be monitored on an ongoing basis. Further action can then be promptly undertaken to rectify any issues, as they arise.
Success Rate	Aim for 80% success rate. In the event plants become diseased, die or become severely damaged, they should be replaced to achieve a success rate of at least 80%.

3.2.4 Fencing

It is expected that the Reserve boundaries will be fenced prior to issue of Statement of Compliance for each relevant stage of the subdivision. Careful consideration will need to be given when undertaking relevant fencing within 30.0 metres of the watercourse to ensure it is not compromised.

Any fencing of the Reserve boundaries will need to allow for the free passage of water and be designed to have no adverse impacts on the hydrology or water quality. This can be achieved by careful selection of fencing style and associated design.

For example, post and wire, wire woven mesh or post and rail fencing styles would be acceptable fencing styles.

3.2.5 Monitoring

Short Term

The short term includes the period of time up to which a Certificate of Practical Completion of Works is issued for the works to be undertaken within the Reserve systems.

The Developer will be responsible for establishing the revegetation across the reserve system and undertaking the initial works associated with weed management and maintenance in the short term.

This will also mean that the Developer is responsible during this period for ongoing monitoring of the waterways system and complying with the WMP at all times.

Whilst there is no formal register or form for undertaking the ongoing monitoring it is recommended that it be visually surveyed at least four times a year until the weed management and revegetation work is undertaken.

Once the weed management and revegetation work has been undertaken it is then expected that monitoring become more frequent. This more frequent surveillance will naturally occur given the need for the ongoing watering and the replacement of dead / diseased plants during this phase of the project.

If the Developer observes the waterway system as suffering detrimental affects during this time, such as erosion or significant weed infestation, advice should be sought from the *East Gippsland Catchment Management Authority* before any remedial works are undertaken.

Medium Term

The medium term includes a period of 24 months following the issue of the Certificate of Practical Completion of Works wherein the Developer will remain responsible for the ongoing management and maintenance of the Reserve system. Consequently, during this period the Developer will remain responsible for adhering to the requirements of the WMP.

Given the need for ongoing weed management, replacement of dead / diseased plants to meet the target of 80% success rate and the need to ensure the overstorey foliage cover remains at 10% frequent monitoring is expected to be undertaken during this phase of the project.

Again, whilst there is no formal register or form for undertaking the ongoing monitoring it is recommended that it be visually surveyed a minimum of four times a year. However, these observations are likely to be much more frequent given the work required to uphold the requirements of the WMP.

If the Developer observes the waterway system as suffering detrimental affects during this time, such as erosion or significant weed infestation, advice should be sought from the *East Gippsland Catchment Management Authority* before any remedial works are undertaken.

Long Term

The long term commences at the conclusion of the 24 month maintenance period when the responsibility for the management and maintenance of the Reserve systems is handed over from the Developer to the East Gippsland Shire Council. Consequently, from this point Council will become responsible for adhering to the requirements of the WMP.

At this point in time the revegetation should be well established and there should be little weed competition meaning that the frequency for monitoring can be reduced and be relatively infrequent.

An acceptable monitoring schedule would be twice a year during the long term phase however in reality it will occur more frequently. Council will be undertaking other maintenance work within the Reserves such as lawn mowing where they will have the opportunity to undertake more informal monitoring.

If the Council observes the waterway system as suffering detrimental affects during this time, such as erosion or significant weed infestation, it is recommended that advice be sought from the *East Gippsland Catchment Management Authority* before any remedial works are undertaken.

4. Conclusion

In summary this WMP has been prepared to ensure that the waterway will not be compromised adversely by the subdivision and associated future residential development.

The implementation of the 30.0 metre exclusion zone from the watercourse will reduce the risk of the waterway system being compromised. This coupled with the revegetation work within the reserve and associated ongoing monitoring and maintenance will ensure that the health of the waterway is enhanced and does not unduly decline.

The Reservation use of the land can occur concurrently with the natural drainage system provided there is respect for the environmental components of the land.

Appendix A

List of species suitable for revegetation – EVC 16: Lowland Forest

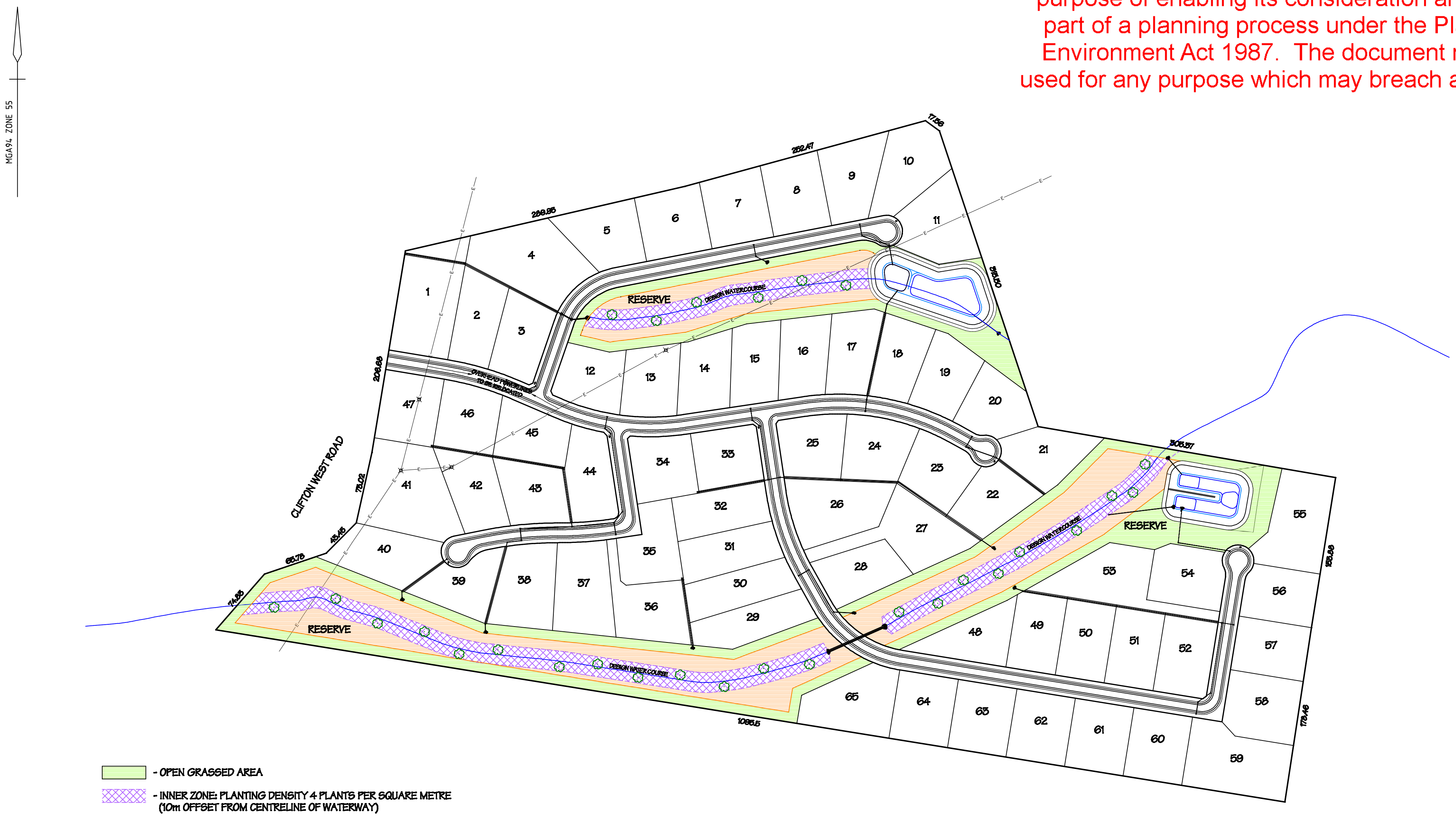
Lifeform	EVC 16: Lowland Forest
Trees / Large Shrubs **>5m**	Apple-topped Box *(Eucalyptus angophoroides)* Yertchuk *(Eucalyptus consideniana)* Mountain Grey Gum *(Eucalyptus cypellocarpa)* White Stringybark *(Eucalyptus globoidea)* Red Stringybark *(Eucalyptus macrorhyncha)* Yellow Stringybark *(Eucalyptus muelleriana)* Red Box *(Eucalyptus polyanthemos)* Silvertop Ash *(Eucalyptus sieberi)* Red Ironbark *(Eucalyptus tricarpa)* Black Wattle *(Acacia mearnsii)* Blackwood *(Acacia melanoxylon)* Golden Wattle *(Acacia pycnantha)* Sunshine Wattle *(Acacia terminalis)* Black She-oak *(Allocasuarina littoralis)* Tree Hakea *(Hakea eriantha)* Cherry Ballart *(Exocarpos cupressiformis)*
Groundcovers and climbers	Wallaby-grasses *(Austrodanthonia spp.)* Spear-grasses *(Austrostipa spp.)* Common Apple-berry *(billardiera scandens)* Creeping Bossiaea *(Bossiaea prostrata)* Blue Pin Cushon *(Brunonia australis)* Bulbine Lily *(Bulbine bulbosa)* Mountain Clematis *(Clematis aristate)* Black-anther Flax-lily *(Dianella admixta)* Paroo Lily *(Dianella caerulea)* Flax-lily *(Dianella longifolia var. longifolia)* Red-fruit Saw-sedge *(Gahnia sieberiana)* Germander Raspwort *(Gonocarpus teucrioides)* Silvertop Wallaby-grass *(Joycea pallida)* Running Postman *(Kennedia prostrata)* Vaiable Sword-sedge *(Lepidosperma laterale)* Wattle Mat-rush *(Lomandra filiformis)* Spiny-headed Mat-rush *(Lomandra longifolia)* Cluster-headed Mat-rush *(Lomandra longifolia ssp. Exilis)* Weeping Grass *(Microlaena stipoides var.stipoides)* Wonga Vine *(pandorea pandorana)* Leafy Purple-flag *(patersonia glabrata)* Handsome Flat-pea *(Platylobium formosum)* Tussock-grasses *(Poa spp.)* Hairy Fan-flower *(Scaevola ramosissima)* Nodding Blue Lily *(Stypandra glauca)* Forest Wire-grass *(Tetrarrhena juncea)* Kangaroo Grass *(Themeda triandra)* Twining Fringe-lily *(Thysanotus patersonii)* Yellow Rush-lily *(Tricoryne elatior)* Blue Bells *(Wahlenbergia spp.)* Ivy-leaf Violet *(Viola hederacea)* Small Grass-tree *(Xanthorrhoea minor ssp.)* Golden Everlasting *(Xerochrysum bracteantum)*

Appendix B

List of species suitable for revegetation – EVC 877: Lowland herb-rich Forest

Lifeform	EVC 877: Lowland Herb-rich Forest
Trees / Large Shrubs **>5m**	Apple-topped Box *(Eucalyptus angophoroides)* Mountain Grey Gum *(Eucalyptus cypellocarpa)* White Stringybark *(Eucalyptus globoidea)* Red Box *(Eucalyptus polyanthemos)* Red Stringybark *(Eucalyptus macrorhyncha)* Black Wattle *(Acacia mearnsii)* Blackwood *(Acacia melanoxylon)*
Groundcovers and climbers	Wallaby-grasses *(Austrodanthonia spp.)* Spear-grasses *(Austrostipa spp.)* Common Apple-berry *(Billardiera scandens)* Creeping Bossiaea *(Bossiaea prostrata)* Paroo Lily *(Dianella caerulea var. caerulea)* Short-stem Sedge *(Carex breviculmis)* Love creeper *(Comesperma volubile)* Thatch Saw-sedge *(Gahnia radula)* Variable Glycine *(Glycine tabacina)* Button Everlasting *(Helichrysum scorpioides)* Common Hovea *(Hovea linearis)* Silvertop Wallaby-grass *(Joycea pallida)* Wattle Mat-rush *(Lomandra filiformis)* Spiny-headed Mat-rush *(Lomandra longifolia)* Weeping grass *(Microlaena stipoides var.stipoides)* Grey Tussock-grass *(Poa sieberiana)* Small Poranthera *(Poranthera microphylla)* Slender Fireweed *(Senecio tenuiflorus)* Nodding Blue-lily *(Stypandra glauca)* Ivy-leaf Violet *(Viola hederacea)* Showy Violet *(Viola betonicifolia)* Trailing Speedwell *(Veronica plebeian)* Yellow Rush-lily *(Tricoryne elatior)* Tall Bluebell *(Wahlenbergia stricta)*

Note: Revegetation comprising species from the above tables is encouraged however use of such species will be dependant upon availability. Other species can form part of the revegetation work however they must be native to Victoria and where possible representative of the applicable EVC.



- OPEN GRASSED AREA
- INNER ZONE: PLANTING DENSITY 4 PLANTS PER SQUARE METRE (10m OFFSET FROM CENTRELINE OF WATERWAY)
- OUTER ZONE: PLANTING DENSITY 2 PLANTS PER SQUARE METRE (10m OFFSET FROM RESERVE BOUNDARY)
- TREE CANOPY COVER TO REMAIN <10%
- REVEGETATION TO COMPRISE OF SPECIES REPRESENTATIVE OF EVC16: LOWLAND FOREST

CLIFTON WEST PROPERTY P/L 240 CLIFTON WEST ROAD, MOUNT TAYLOR		NOTATIONS	RESERVE LANDSCAPE PLAN
Crowther&Sadler Pty. Ltd. LICENSED SURVEYORS & TOWN PLANNERS 182 MACLEOD STREET, BAIRNSDALE, VIC., 3875 P. (03) 5152 5011 E. contact@crowthersadler.com.au	SCALE (SHEET SIZE A1) 1 : 2000 SCALE (SHEET SIZE A3) 1 : 4000	SURVEYORS REF. 19502 VERSION 2 - DRAWN 02/07/2025	PARISH OF WY YUNG CROWN ALLOTMENT 62A TP278078

FILENAME: Y:\19000-19999\19500-19599\19502 Clifton West Property\19502 Reserve Landscape V2.pro

CHRIS O'BRIEN & COMPANY PTY LTD
CONSULTING CIVIL & STRUCTURAL ENGINEERS
ABN 69 088 752 958

Reference No: B21169

Project No: 260821

13/09/2021

Crowther & Sadler Pty Ltd
P.O Box 722
BAIRNSDALE Vic 3875

Attn: Kate Young

Email: kate@crowthersadler.com.au

Dear Kate,

RE: Geotechnical Risk Assessment for Proposed 65 Lot Residential Subdivision 240 Clifton West Road, Mount Taylor.

INTRODUCTION

Chris O'Brien & Company Pty Ltd have been engaged by Kate Young of Crowther & Sadler Pty Ltd to provide a Geotechnical risk assessment report for a proposed 65 Lot residential subdivision at 240 Clifton West Road, Mount Taylor Vic 3875. An erosion management overlay exists over the property.

The purpose of this letter is to determine if the works to be carried out on this site will be a risk to the surrounding environment and is to be used in the planning application process only. This letter is not a soil classification report and shall not be used for this purpose.

Information contained in this letter is from a visual inspection of the site and based on information supplied to Chris O'Brien & Company Pty Ltd on the work to be completed on the site.

Note that in accordance with "Guidelines for Landslide Susceptibility" Section 5: Landslide Zoning: the subject site would not be considered in a landslide hazard zone.

The site was inspected by Andrew Powell on the 9th September 2021.

SITE DESCRIPTION

The approximate 60 hectare site is currently used for cattle grazing and is located on a rolling hill system and displayed a good cover of grass. The site had low to moderate falls with a maximum fall observed on the site of approximately 1 in 5. The site currently drains to a series of dams and natural watercourses. Typical of most grazing land only a few trees exist on the site. A series of photographs are attached to the end of this report displaying the dams, natural water courses and the lay of the land.

All correspondence to:
P.O. Box 18
Traralgon Vic. 3844

13A Church Street
Traralgon Vic. 3844

Telephone (03) 5174 9811
Facsimile (03) 5174 9811

PROJECT DETAILS

Works to be completed on site include the provision of roads and underground services such as storm water drainage, reticulated water, power and NBN services. It is also intended to fill in the top dam which will no longer be required as part of the overall drainage system for the site.

FIELD INVESTIGATION

The site was inspected on the 9th September 2021 to assess what is currently occurring on site in regards to erosion, how the site is currently drained and to assess the soil types on site in relation to erosion control and to assess suitable for on-site domestic waste water treatment for the lots to be created.

Visual confirmed no current erosion problems on site with the site being suitably drained towards existing dams and the natural water courses.

Soil samples were taken at numerous locations on the site with soil conditions generally being fairly consistent over the entire site with variations in the flat areas where is expected no batters will need to be formed.

Generally the soils are as follows:

0 – 200	Dark brown fine sandy loam topsoil damp & firm with coarse grass roots
200 – 450	Brown/grey silty loam damp & firm.
450 – 800	Orange/tan sandy clay loam damp & stiff.

No adverse moisture conditions of fill were encountered during the soil investigation of the site. It is expected that the topsoil will be stripped in work areas and stockpiled for future use on site. Soils found were cohesive, strong and considered ideal for forming batters up to a maximum slope of 1 in 2.

SUMMARY OF RISKS

LANDSLIDE	**LOW**
SHEET/RILL EROSION	**LOW**
TUNNEL EROSION	**LOW**

- Low to moderate grades over the entire site ranging from about 1 in 20 to 1 in 6.
- There is no evidence of any landslip or soil erosion on any of the surrounding properties
- Land to the north currently surface flows through the site down through the existing watercourse which runs through the property. Visual inspection showed no erosion occurring from this practice, with the intention to maintain the water course as a point of drainage. Currently the existing excellent grass cover is protecting the soils under and this is to be maintained.
- A construction management plan will need to be implemented for entire construction time for the roads and associated underground services. The plan will need to show measures to be undertaken to control erosion and storm water during the construction period. The following will have to be considered:

i. Location of any temporary construction works office and machinery storage area.
ii. Identification and location of areas suitable for the stockpile of topsoil with measures of erosion control to be shown (i.e. diversion banks and sediment fences)
iii. Measures and techniques to protect drainage lines and watercourses from sediment runoff from disturbed or under construction areas.
iv. Drainage of all construction and stockpile areas for the duration of the works and details of stormwater treatment to be provided.
v. A stabilized vehicle access point to and from all storage areas on the site for the entire length of the construction
vi. The form, bulk, scale and location of cut and fill is to be controlled to ensure no adverse effects on the natural water courses and existing dams. (i.e. diversion banks and spoon drains)
vii. All erosion and sediment control measures will need to be inspected on a daily basis by the site manager with any maintenance required to be rectified immediately.

- Storm water management plan for the whole site, with drainage treatment and details and control of storm water run-off to be clearly indicated. Control of sediment run-off and erosion control details to be shown. It is essential that all storm water run-off from construction areas be treated prior to entering site run-off areas.

The above recommendations will need to be provided and approved prior to the commencement of any construction works on site. All storm water pits, silt fences etc will need regular maintenance to ensure the systems work as intended, as any silt build up in pits etc could cause the system to fail.

We therefore suggest that a full geotechnical risk assessment report is not required for this development. As long as all recommendations above are strictly adhered to, we anticipate no environmental risks with the work to be undertaken.

Should you need to clarify anything, please contact the Andrew Powell on 0402384596

Yours faithfully,

Andrew Powell Assoc.Dip (Civil)
for CHRIS O'BRIEN & COMPANY PTY LTD

Photos below shows the existing dams on the northern part of the proposed development, with the dam in the first photo to be filled in.

Aboriginal Heritage Act 2006
Section 65

Cultural Heritage Management Plan – Notice of Approval

CHMP NAME:	**Residential Subdivision and Development, 240 Clifton West Road, Mount Taylor**		
CHMP NUMBER:	**18040**		
SPONSOR:	Clifton West Property Pty Ltd	*ACN/ABN:*	17 649 762 078
Cultural Heritage Advisor(s):	David Mathews and Joseph Minter Brooke		
Author(s):	David Mathews and Anna Light		
Cover date:	21st February 2022	*Pages:*	127
Received for approval:	21st January 2022		

TO BE COMPLETED BY THE Registered Aboriginal Party DELEGATE **I have considered the Evaluation Report for this CHMP and:**	**Yes**	**No**
I am satisfied that the CHMP has been prepared in accordance with the standards prescribed for the purposes of section 53 (in the Aboriginal Heritage Regulations 2007 and the Approved Form).	Yes	
I am satisfied that the CHMP adequately addresses the matters set out in section 61.	Yes	

I, Russell Mullett, RAP Manager, Gunaikurnai Land and Waters Aboriginal Corporation, acting under authority delegated to me by the BOARD OF DIRECTORS, and pursuant to section 65(2) of the *Aboriginal Heritage Act 2006* hereby **approve** this cultural heritage management plan:

Signed: … R Mullett ……

RUSSELL MULLETT

Dated: 23rd February 2022

- **This notice of approval should be inserted after the title page and bound with the body of the management plan.**
- **The recommendations in this management plan are now compliance requirements. Officers from the Department of Premier and Cabinet may attend the subject land to monitor compliance with the recommendations.**

polis
planning

Social Impact Assessment

Proposed Multi-Lot Subdivision
240 Clifton West Road, Mount Taylor

Prepared by Polis Planning
for
Clifton West Property Trust
449 Main Street BAIRNSDALE VIC 3875

September 2021

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Executive Summary and Assessments

The preparation of the Social Impact Assessment for 240 Clifton West Road, Mount Taylor has been undertaken using current practice and following the outline prescribed by the East Gippsland Shire Council under the *Social Impact Assessment Guidelines for Development Applications* (2015), a reference document to the East Gippsland Planning Scheme.

The Assessment has considered all the matters that impact on the social health and community wellbeing of the potential population at the proposed development. In many cases the data that is available is sourced from the 2016 Population Census provided through the Australia Bureau of Statistics (ABS). As such, a number of indicators have been extrapolated to 2021 using an average growth rate for East Gippsland of 1.2% per annum. Using the broad East Gippsland percentage growth is a conservative estimate but does provide some way of understanding the community into which the proposed development will be placed.

The following assessment results are dealt with in more detail within the report but are provided here in summary. The improvements that support high value social and wellbeing outcomes for the residents within the proposed development site, will need to be undertaken by the developer. The works external to the development that improve the safety and accessibility of Clifton West Rd and Bullumwaal Road for all residents of Mt Taylor and beyond, will need to be factored into the planning and funding of those public bodies responsible for road maintenance and construction.

- That the environment in which the development is proposed provides excellent opportunities for interactions with the local native landscape through walking and cycling and encourages improved outcomes for mental and physical wellbeing.

- That where possible there are recreational and experiential play opportunities that can be designed within the proposed development, especially where they co-locate with natural water flow management design.

- That there is no necessity for any new services to be co-located or relocated to the proposed development area. The close proximity to the large regional town of Bairnsdale with its extensive range of health, education, cultural, recreational, retail and service provision is sufficient to manage the demands of the potential development community.

- That this community, if fully developed , will consist of approximately 174 people at the level of 60 dwellings. This again uses local statistics that suggest that the average household in this area is 2.9 persons per dwelling.

- That both the East Gippsland Shire and the transport coordinator at Bairnsdale Secondary School have stated that the access to school buses for current students living along Clifton West Road is inadequate. The East Gippsland Shire reported that they are currently considering the works required to improve the intersection at the corner of Bullumwaal Road and Clifton West Road that will allow vehicles, both public and private, to safely turn into and out of Clifton West Rd. This will have a positive effect on all current and future residents along the length of the road.

- That there will be increased vehicle and cycling along Clifton West Road resulting from this proposed development (and another currently under planning consideration) that will require appropriate signage and visibility be provided by East Gippsland Shire to enhance the safety of the road for all users.

- That there is no requirement for the infrastructure or staffing of local schools and agencies to factor in the increase in population from the proposed development as the capacity demands are minor and will take a number of years to reach.

- That employment opportunities have increased in the areas of health and social services which now employ more people than other industry sectors, including agriculture.

- That the proposed development is an opportunity for actions to be requested of both NBN and the mobile service providers to improve digital connectivity to the site, based on an increase in potential customers.

The pre-planning consultation carried out between Polis Planning and the Strategic Planning Manager and Coordinators at East Gippsland Shire, discussed the proposed development as part of the guidelines for the requirement of the SIA. There were no significant issues raised by EGSC at that time that required specific investigation within the assessment process.

Declaration:

This report is provided in support of the planning application from the developers, Clifton West Property Trust, for land at 240 Clifton West, Mount Taylor and represents a professional assessment by Polis Planning of the social impacts of that proposal.

Bruce Smith

Bruce Smith M.Soc Sci, M.Sci, MPH.

Principal Consultant

Introduction

The following Social Impact Assessment (SIA) is designed to examine the impact on communities, services and agencies from a proposed multi-lot residential development at 256 Clifton West, Mount Taylor.

The SIA will provide a reference document for Clifton West Property Trust, in its planning applications, under the requirements of the East Gippsland Planning Scheme.

The scheme states, at 21.08-2 (p 192)

Applications for a subdivision which will create more than 60 lots are to provide a social impact assessment in accordance with the East Gippsland Shire Council Social Impact Assessment Guidelines for Development Applications.

The East Gippsland Shire Council Social Impact Assessment Guidelines for Development Applications requires proposed developments to provide a Social Impact Assessment for the purposes of:-

- Identifying social issues and potential social impacts relevant to particular policies for particular communities and circumstances;

- Assessing those impacts, in terms of their magnitude, duration, and the probability of their occurrence; and

- Recommending measures that will reduce negative impacts and enhance positive impacts of a decision. (p:7)

In the case of a residential development in excess of 60 lots the Guidelines require a full Social Impact Assessment.

4.1.2 Social Impact Assessment

A SIA is an in-depth assessment about the actual and potential social impacts. This assessment should be undertaken by a suitably qualified professional.

The applicant should seek a meeting with council officers early in the process and follow Council's guidelines. A SIA for large developments should be undertaken early in the planning process (e.g., at rezoning and or masterplan/precinct plan stage). The SIA accompanying subsequent applications referring to the same site and development would then only need consider those issues identified as outstanding from the SIA process. (p:10)

Polis Planning met by video with senior planning staff at East Gippsland Shire Council on 8 September 2021. Their requirements are discussed separately below; however, it was commented that this proposal had been the first proposal for some time where there was a pre planning meeting held at the request of the developers Social Impact Assessment consultant.

The Development Proposal

This a proposed residential subdivision in a Low-Density Residential Zone[1] at the northerly end of the Clifton West Road in Mt Taylor. It will yield in excess of 60 large blocks with final numbers being determined by a number of factors including drainage lines, internal road design and topography.

The development will be on land formerly used for livestock farming and includes four dams along a west to east watercourse and has access to Clifton West Road along a 200-metre frontage. The land has a broad west-east ridge with slopes to the south and north sides, where the dams are located.

The development will attract a range of family groups with children, seeking more living space and a quieter environment and those looking to move to a semi-rural area, as part of pre or post retirement plans. Increased migration from urban areas to regional communities has been a feature of the demographic shifts that have been occurring over recent years with these numbers being further intensified by the effects of the COVID-19 pandemic.

Proximity to Bairnsdale, a regional centre with a range of retail, hospitality, health and recreation facilities is an attractive feature of these developments and this study will assume that those existing services and facilities need not be duplicated to service the community that will develop at 240 Clifton West Road.

Where necessary, however, there will be a need for some services to factor in the community and this will be discussed in more detail further in the report but are specifically about public transport access and small increases to local schools. Car ownership will increase by 100-150 vehicles once all lots are

[1] **The Low-Density Residential Zone** (LDRZ) is a 'residential' zone. It specifies a lot size of at least 0.4 hectares in areas where reticulated sewerage is not connected or 0.2 hectares for each lot connected to reticulated sewerage. A different lot size can be specified in a schedule to the zone. Source: DELWP-PPN 37 (2015)

occupied and therefore there will be a need for the road manager to factor in the extra usage, based on the traffic management study.

Pre-Planning Recommendations from the East Gippsland Shire Council Strategic Planning Unit

Polis Planning met with Council planning staff on 8 September 2021 and discussed the proposed development, with specific requests to understand any issues that Council wanted addressed within the SIA, pertinent to the proposed site and its connections to social, economic and wellbeing outcomes. The discussions are recorded as follows.

- Council staff were aware of the issues identified by Polis Planning with regard to the inability of public buses accessing Clifton West Road. As there is also a very recent parcel of land designed for residential development at 30 Clifton West Road, that is going through the permit process, there is greater pressure to resolve this issue and Council was aware that the work requires to be done. No timeframe was discussed for when this may occur.

- It was agreed that with its proximity to Bairnsdale, a major regional centre, there was no reason for the SIA to require the establishment of new community, education or health services to serve residents within the proposed development. Polis Planning has already contacted relevant services to understand any capacity issues that will occur from the proposed development. See further for more details.

- The area is the most northerly part of the LDRZ in Clifton West Road and as such will not see further residential development north of the development boundary. There will no doubt be further infill along the road south of the proposed development, however it is unlikely that this will have any significant effect on the residents at 240 Clifton West Road.

- Where possible, there should be the opportunity for co-location of walking paths within the drainage management zones to provide recreational and social activities, using appropriate design, to improve wellbeing for residents of the proposed development.

Social Impact Assessment Process

Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.

The important features of this definition are that:

The goal of impact assessment is to bring about a more ecologically, socio-culturally and economically sustainable and equitable environment. Impact assessment, therefore, promotes community development and empowerment, builds capacity, and develops social capital (social networks and trust).

The focus of concern of SIA is a proactive stance to development and better development outcomes, not just the identification or amelioration of negative or unintended outcomes. Assisting communities and other stakeholders to identify development goals, and ensuring that positive outcomes are maximised, can be more important than minimising harm from negative impacts.

The methodology of SIA can be applied to a wide range of planned interventions and can be undertaken on behalf of a wide range of actors, and not just within a regulatory framework.

SIA contributes to the process of adaptive management of policies, programs, plans and projects, and therefore needs to inform the design and operation of the planned intervention.

SIA builds on local knowledge and utilises participatory processes to analyse the concerns of interested and affected parties. It involves stakeholders in the assessment of social impacts, the analysis of alternatives, and monitoring of the planned intervention.

The good practice of SIA accepts that social, economic and biophysical impacts are inherently and inextricably interconnected. Change in any of these domains will lead to changes in the other domains. SIA must, therefore, develop an understanding of the impact pathways that are created when change in one domain triggers impacts across other domains, as well as the iterative or flow-on consequences within each domain. In other words, there must be consideration of the second and higher order impacts and of cumulative impacts.

In order for the discipline of SIA to learn and grow, there must be analysis of the impacts that occurred as a result of past activities. SIA must be reflexive and evaluative of its theoretical bases and of its practice.

While SIA is typically applied to planned interventions, the techniques of SIA can also be used to consider the social impacts that derive from other types of events, such as disasters, demographic change and epidemics.

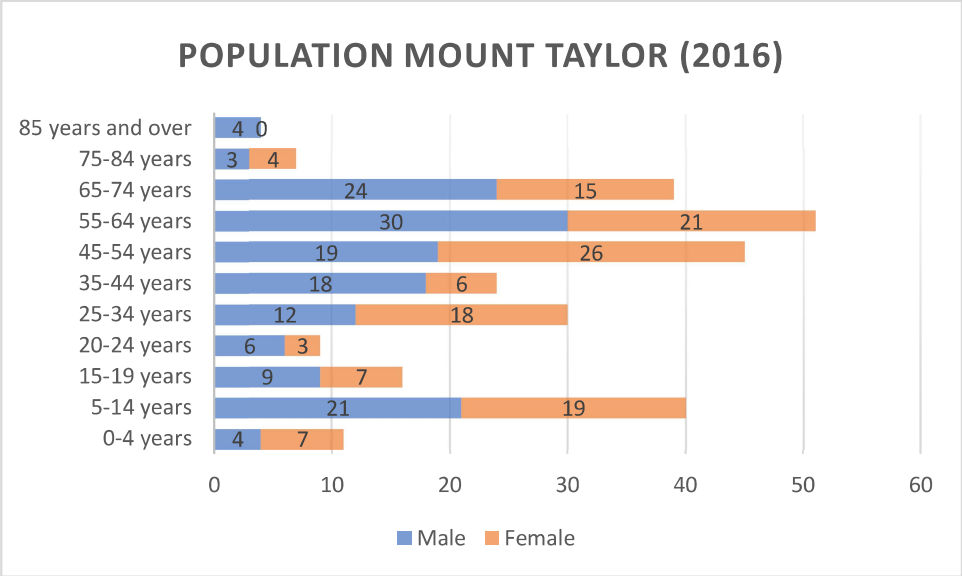
- From the International Association for Impact Assessment

Social Impact Assessment Considerations- Social Demographics of Mount Taylor and Surrounding Populations

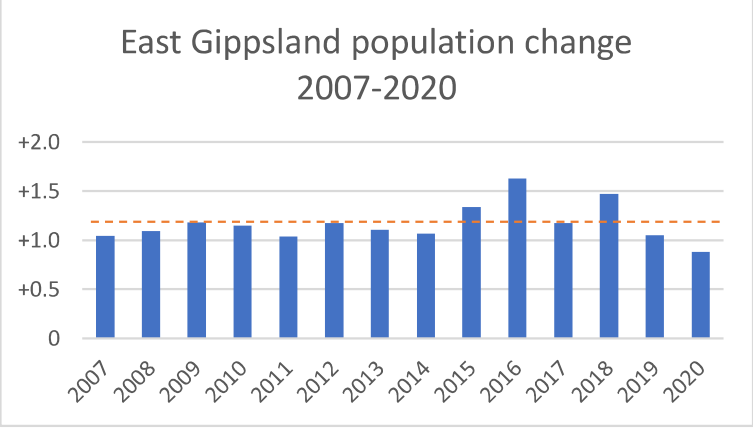
Mount Taylor is a small residential and farming area, approximately 9 kilometres north-west of the large regional town of Bairnsdale, in the Shire of East Gippsland.

Population

The total population of Mount Taylor was 286 at the time of the 2016 Census.



The average annual population growth across East Gippsland from 2007-2020 was estimated to be 1.2% p.a. This would put the current, estimated population of Mount Taylor at 286 x (5x 1.2) % = 303. The August 2021 Census data, usually available in June of the following year, will provide greater accuracy on the overall size and make-up of the population.



We can make a number of observations from these statistics including the significant population cohort from 55-74 years old and the small number of young people aged 15-24 years. This is typical of regional and peri-regional centres where older people are aging within their own communities and younger people find education and employment opportunities are more available in the major

regional or urban based settings. The growth rates are also indicative of the relatively slow residential market in East Gippsland, although there is recent evidence that there is a rise in in-migration that will be confirmed by the ABS Census 2021 data. This has been facilitated by people moving from cities as working from home becomes a more permanent facet of employment and people need not be located within metro or urban environments. The COVID-19 pandemic has also been a major influencer in people moving to regional and rural areas from the lockdown restrictions that have been enforced in metropolitan areas.

Social Impact Assessment-Key Determinants of Growth

Effects of Proposed Development Population

This section of the report examines the social and cultural changes that may result from this proposed development. Below we examine the current and future environments in and around the site to understand this change and to not only identify any issues that need to be addressed but also to evaluate the benefits that the proposal will bring.

Physical Amenity

The proposed development is in a farming and rural living area with strong environmental features, such as rural vistas and proximity to forested areas with native timbers and plants. There is evidence that natural environments contribute to Health and Wellbeing outcomes for residents, as discussed by Ewart et al (2014)[2].

Research has found that nature experiences can: contribute to physical health and psychosocial well-being (Ulrich et al., 1991; Burdette and Whitaker, 2005; Norman et al., 2010); foster a sense of community (Breunig et al., 2010); increase spiritual awareness and well-being (Cosgriff et al., 2010); and aid in recovery from mental fatigue and restore attention (Kaplan and Kaplan, 2005) (p.143)

The proposed development is situated 5 kms northwest of the town of Wy Yung, which itself is only 4 kms from the regional centre of Bairnsdale. As such there are few facilities within Wy Yung except a hotel and a small bakery/general store. There is also a campus of Gippsland Grammar and the long-standing Clifton Waters Retirement Village.

The proposed development is serviced by Clifton West Road a small, sealed road that is used almost exclusively by passenger vehicles. Public transport is not available to the proposed development due to constraints to bus entry and egress at the junction with Bullumwaal Rd. This is discussed further in the Report.

Recreational Amenity

Although there are no structured recreational parks proximate to the proposed development, the location provides many opportunities for walking, cycling and engaging with the natural environment. A structured park with activity equipment is available at Apex Park, which is located in Wy Yung at a

[2] Ewert, A. W., Mitten, Denise, Overholt, Jillisa, & C.A.B. International, issuing body. (2014). *Natural environments and human health*.

distance of 5 km from the proposed development. The town of Bairnsdale has a full set of regional sports facilities and clubs that support such activities as football, cricket, netball, basketball, soccer and a range of aquatic and gym activities available at the Bairnsdale Aquatic and Recreation Centre (BARC). The activities listed for the BARC are as follows:-

25m heated indoor pool	Warm water exercise pool	Children's pool with water features
Learn to Swim program	Spa and sauna	Health Club
Group fitness sessions	Kiosk / cafe	3-court stadium

Bairnsdale Aquatic and Recreation Centre

Social and Cultural Amenity

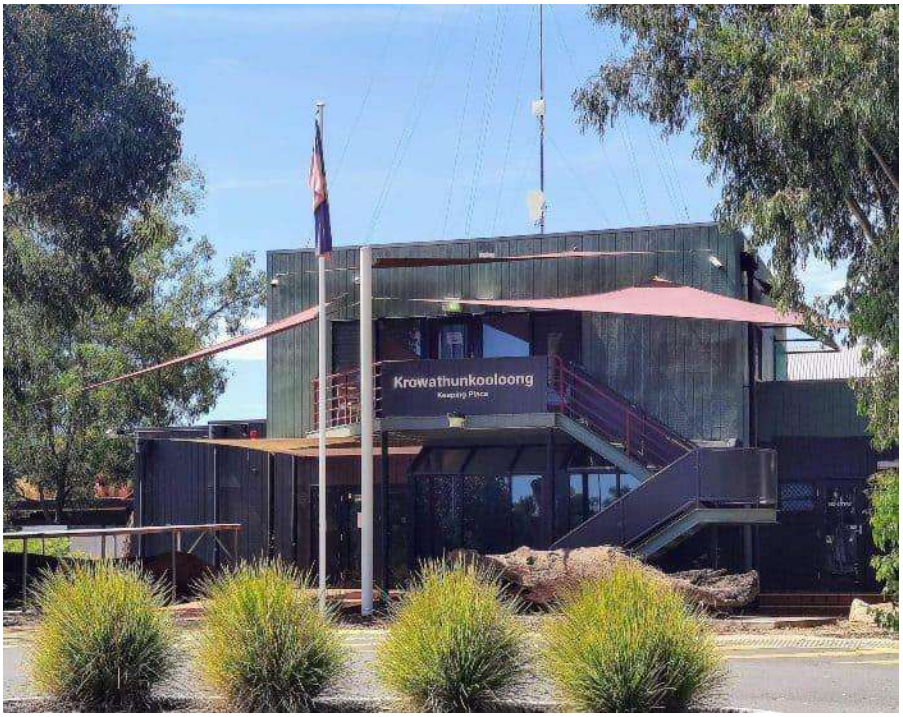
Like all multi-lot development proposals, communities form, based on their closeness to neighbours and relationships build to accommodate their similarities and differences. These communities are also strengthened by being able to engage with nearby social and cultural institutions and structures.

There is a very active hotel at Wy Yung that provides entertainment and the usual range of meals and hospitality for local and other residents.

There is a wide range of social and cultural activities centred in Bairnsdale that provide for local and regional users. These include:

- Krowathunkooloong Keeping Place - Bataluk Cultural Trail
- The Forge Theatre and Arts Hub
- East Gippsland Art Gallery
- The Hub including the U3A
- Various Entertainment venues at Clubs and Hotels
- Service Clubs-Rotary, Lions and Apex
- Senior Citizens Club, Bairnsdale
- Bairnsdale RSL

The Forge Theatre and Arts Hub



Krowathunkooloong Keeping Place - Bataluk Cultural Trail

Health and Wellbeing

The East Gippsland municipality, as with the other 78 local government areas, is monitored by the Department of Health across a number of health and wellbeing determinants. A brief overview of the latest data from the 2017 Victorian Population Health Survey provides a context by which this SIA can determine what health and wellbeing factors will need to be considered for the residents of the proposed development.

Health and Wellbeing Determinants	East Gippsland %	Victoria %
Obesity	21	19
Overweight	60	50
Daily consumer of sugar sweetened soft drinks	10	10
Take-away food consumed > 1 day/week	20	15
Complied with vegetable consumption guidelines	7	5
Insufficiently physically active	49	44
Daily smoker	14	12
Increased lifetime risk of alcohol-related harm	56	43
Low or medium life satisfaction	18	20
Anxiety or depression	34	27
Two, or more, chronic diseases	30	25
Had a blood-pressure test in last 2 years	67	80
Had a mammogram to detect cancer in last 2 year	79	79
Sought help for a mental health related problem	15	18

Source: DoH: Victorian Population Health Survey 2017

Key to healthy lifestyles in East Gippsland is the reduction of the incidence of overweight and obesity in the community, the increase of physical activity and better access to environments supportive of positive mental wellbeing. This can be managed through both improved dietary composition and increased access to healthy environments that support increased physical activity and mental health.

The SIA process supports residential property development proposals where there is planned access to open and shared spaces that supports connections between residents, where there are opportunities for physical activity both within and proximate to the proposed development, good access to health and wellbeing services and more structured activities within nearby recreational facilities. The proposed development at 240 Clifton West Road, although not fully defined at the time of this report, has strong indications that all of the above determining factors for a healthy lifestyle, will be satisfied.

More detailed study of the internal spaces within the proposed development would promote accessibility and safety as key to health and wellbeing, especially regarding the outcomes for social inclusion and personal freedom, key elements of positive mental health environments.

Access to Health and Wellbeing Services

As discussed above, the proximity to the major regional town of Bairnsdale is an important contributor to better health and wellbeing outcomes for residents of the proposed development.

Bairnsdale Regional Health Service is situated at 8.8 km from the proposed development. It provides a range of clinical and diagnostic services from acute and emergency, surgical, maternity, orthopaedic and a facility for aged care. Consulting rooms are available for visiting specialists within BRHS which reduces the travel time to appointments for those living close to Bairnsdale.

Bairnsdale also has a number of General Practitioner Clinics and a range of allied health practitioners, pharmacies and remedial health services. Gippsland Complete Health, a large community health

service based in Bairnsdale and Lakes Entrance offers a range of medical, health and aged care services, including Home and Community Care Services.

Gippsland Complete Health- Bairnsdale

Although there are always issues of retention and attraction of health professionals into regional areas, which affects the availability of services, the development proposal is well positioned to be able for residents to access the range of services in a regional centre within short distances and travel times.

Transport

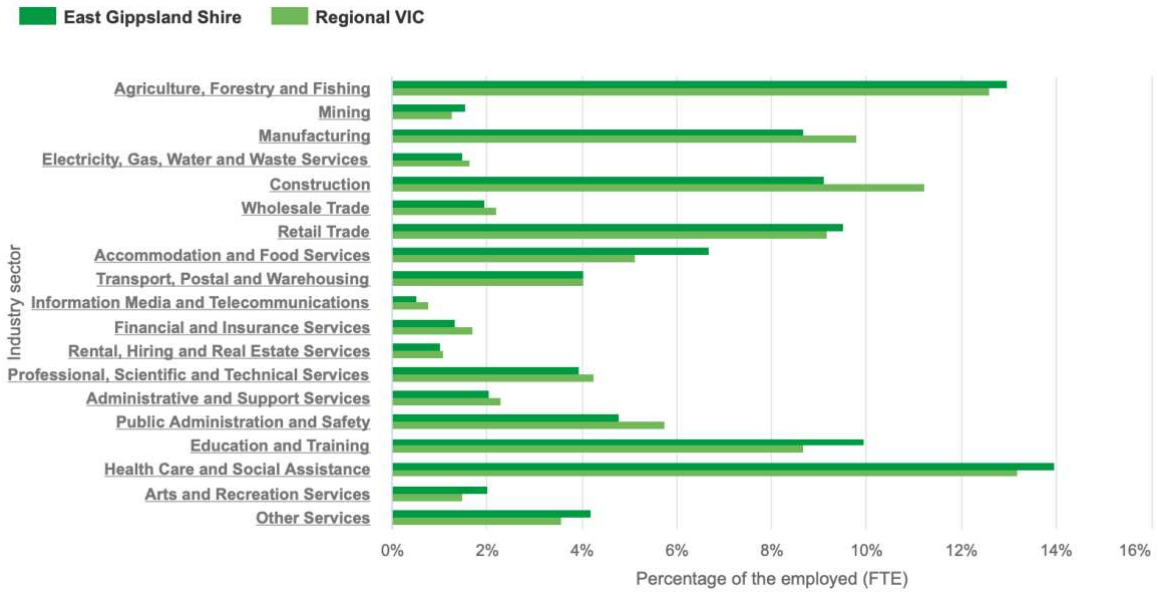
Public- Advice from the Bairnsdale Secondary College bus coordinator indicated that school buses can only stop safely at the corner of Links Rd and Bullumwaal Rd Wy Yung, 270 metres southeast of the entry to Clifton West Rd. The road entrance into Clifton West Road is not considered by the bus services to be a safe area for students to be picked up or dropped off. This was discussed with East Gippsland Shire Council as part of the pre-planning consultation for this SIA. As there is another more recent residential development in Clifton West Road that will also contribute to the number of school aged children/young people, Council believes that the road junction needs to be addressed, given the growing numbers of students and the vehicle traffic from existing and new residential developments.

Private- With a minimum of 60 lots within the development proposal and an average of 86.5% of all households in the Mt Taylor area having two or more vehicles, it could reasonably be expected that there would be, over time, at least 100 vehicles associated with the proposed residential development. Travel from the proposed development to Bullumwaal Rd is 2.4 kms and until there is an opportunity for access to public or private buses, there will be increased vehicle traffic which would have an impact on the existing community and the overall safety of the single access road. There may well be a case for providing improved signage along this road to reduce speed or provide notice where cars are entering from the small residential communities onto Clifton West Road. It could also be expected that young people will be cycling to the bus stop on Bullumwaal Road, Wy Yung in increased numbers, so until the access to Clifton West Road is improved to allow buses to

enter the area, there should also be improved visibility and signage along the road as a safety measure for cyclists and motorists.

Employment

Employment opportunities within East Gippsland and specifically Bairnsdale are discussed below. Comparison area used is Regional Victoria as this provides a more appropriate perspectives on the opportunities in regional and rural areas.



An analysis of the table above, by ID Profile, the East Gippsland Shire demographics provider, indicated a shift in employment for full-time equivalent (EFT) of local workers in 2019/20, from previous years. Indeed, the biggest decline is in the Agriculture, Forestry and Fishing sector, mainly the agricultural sub-sector, which lost 954 EFT between 2015 and 2019. Conversely the Health Care and Social Assistance sector gained 375 EFT making it the largest employment sector in East Gippsland. Although this was the trend across Regional Victoria, the sharp decline in Agriculture was more pronounced in East Gippsland.

Current, as of 2019/2020, these were the EFT of the leading (37%) employment sectors.

- Health Care and Social Assistance (2,071 people or 14.0%)
- Agriculture, Forestry and Fishing (1,923 people or 13.0%)
- Education and Training (1,478 people or 10.0%)

The major differences between the jobs held by the full-time equivalent local workers of East Gippsland Shire and Regional VIC were:

- A *smaller* percentage of full-time equivalent local workers employed in Construction (9.1% compared to 11.2%)

- A *larger* percentage of full-time equivalent local workers employed in Accommodation and Food Services (6.7% compared to 5.1%)

- A *larger* percentage of full-time equivalent local workers employed in Education and Training (10.0% compared to 8.7%)

- A *smaller* percentage of full-time equivalent local workers employed in Manufacturing (8.7% compared to 9.8% [3]

These changes indicate the skills base of the East Gippsland workforce has moved from agriculture to the health service and education industries, especially those engaged in medical and other healthcare services (allied health). In terms of the employment prospects for those likely to become residents in the proposed development, acting as a small satellite community to Bairnsdale, there would be greater opportunities for positions to be available in Bairnsdale and surrounding districts where the majority of the health and education services are represented.

Education and Childcare

Using the existing demographic profile of Mount Taylor, we can assume that the proposed development will contain 174 people if we use a base of 60 dwellings. This is calculated on the average number of people per household in this area as 2.9. The current percentages of the following age groups gives the estimated number of young people for the base 60 dwellings.

Education/Care Stage	Age Group	Percentage of overall population	Projected Number
Childcare/Kindergarten	0-4	6.7	12
Primary	5-9	6.4	11
Primary/Secondary	10-14	5.3	9
Secondary/Tertiary/TAFE	15-19	6.7	12
	Total	**25.1**	**44**

Childcare is an important part of the established trend for both parents or a single parent (in a single parent household) to be engaged in either full or part-time employment. As part of the income generation capacity of households, childcare needs to be both affordable and available. Although there are a number of childcare centres in and around Bairnsdale, it is common for services to express high demands and waiting lists. Many childcare centres also provide 3- and 4-year-old kindergarten as a result of the funding of universal kindergarten in Victoria. Federal Government subsidies for childcare are available to parents through Services Australia and are based on income and hours of employment.

As there are a number of childcare and kindergarten services within 8-9 kms of the proposed development, it is considered that, despite shortages of places, new residents with young children could be confident that they would have opportunity to find a local childcare/kindergarten provider.

[3] Available at ID Profile: https://economy.id.com.au/wegs/employment-by-industry-fte?WebID=110&BMID=20

Primary school students would be able to access Lucknow Primary School (6.8 kms from the proposed development) as their closest government school with secondary school students accessing Bairnsdale Secondary College. There are choices in non-government schools including Catholic primary school, St Marys and secondary, Nagle College and other private education providers including, Gippsland Grammar, Wild Cherry School (a Waldorf/Steiner school K-6) and the Bairnsdale Christian Community School.

The issues of transport have been discussed above and should be resolved as the demand from student numbers increases with take-up of residential lots.

There are ongoing issues that relate to the uptake of tertiary positions from students in East Gippsland that are either related to the limited offerings of tertiary institutions in the municipality, the distance to metropolitan and regional universities or the cost of attending geographically distant learning institutions. The amalgamation of universities that have seen the development of Federation University and its vocational offerings from Federation TAFE, have improved the situation over the past five years however there are still a number of existing barriers to tertiary education.

There are also a number of Registered Training Organisations that provide full online and accredited programs that have become more accessible to East Gippsland students and learners of all ages. This also goes to the discussion below on digital connectivity

Distances to a range of education facilities are shown as indicative of the proximity to the proposed development.

- Bairnsdale Childcare and Kindergarten-6.8 kms
- BK's Early Learning Centre-8.2 kms
- Lucknow Primary school- 6.8 kms
- Bairnsdale Secondary-8.2 kms
- Nagle College &St Mary's Primary-11.3 kms
- Gippsland Grammar-5.4 kms
- Federation TAFE- 8.5 kms.
- Federation University -172 kms
- The Hub- Community Learning/ Tertiary Hub- 8.1 kms

Positive Ageing

The East Gippsland Shire Council has a policy document *Ageing Well in East Gippsland* [4]that outlines a strategy for building an age friendly community in East Gippsland. Given that East Gippsland is one

[4] Available at https://www.eastgippsland.vic.gov.au/council/age-friendly-communities-strategy

of Victoria's highest per capita populations of ageing people, with a prediction that almost 40 per cent of the population being over 60 years by 2020, it has joined the other 19 municipalities within Victoria that have already super aged. The Council strategy outlines the following supporting and key actions.

- Leading a Victorian Government funded project for developing East Gippsland as an age-friendly community, through planning and community engagement;
- Investing in infrastructure upgrades that support the economic and social benefits of towns adopting an age-friendly approach to future growth; and
- Developing an age-friendly network that supports, promotes and celebrates ageing as a positive outcome of our wellbeing and as a catalyst for inter-generational engagement and respect.

The wellbeing opportunities for an older group of residents in the proposed development is supported by a range of clubs (eg. Bairnsdale Senior Citizens) and activities specifically designed for their use within the Bairnsdale area. A previously mentioned, there are good health and care services available from both the BRHS , GP practices and allied health teams, as well as Home and Community Care (HACC) providers working under the My Aged Care funding from the federal government. Gippsland Lakes Complete Care is a major provider of the HACC program for the region and is based in Bairnsdale and Lakes Entrance.

There are also opportunities for older residents to engage in adult learning through the 400 member Bairnsdale University of the Third Age (U3A) based at the Hub, in Dalmahoy Street Bairnsdale.

Services for Young People

East Gippsland has a history of engagement with young people through East Gippsland Shire Council, various community and service agencies, sporting clubs and education providers. The recent establishment of Headspace in Bairnsdale has been a positive step in providing mental health and other services for young people and there are existing programs such as the East Gippsland Youth Ambassadors that provide a voice for young people and the FreeZa, a youth led performance program that provides drug and alcohol-free entertainment activities throughout the year.

Sporting clubs provide both recreational and competitive activities for young people and many clubs are involved in campaigns with Gippsport that promote the Good Sports programs.

All these opportunities are freely available to young people within the proposed development although independent travel to these organisations and programs are not well serviced due to limited bus transport. Until this is addressed young people will remain reliant on car travel with parents and friends, although cycling to Bairnsdale is an alternative.

Cultural Diversity and Connection

East Gippsland has the fourth highest Aboriginal and Torres Strait Islander (ATSI) communities in Victoria with 3.4% of all Bairnsdale residents identifying themselves as ATSI. There are a number of Aboriginal organisation within Bairnsdale including a large health, housing and social service organisation, Gippsland and East Gippsland Aboriginal Co-operative (GEGAC), which also co-locates with the cultural centre, Krowathunkooloong -Keeping Place.

Although rural and regional areas of East Gippsland have a very high proportion of residents born in Australia there are an increasing number of migrants moving into these areas. The 2016 Census states that Bairnsdale has 20.6% of its residents born outside of Australia. Although the majority of these come from English speaking countries (United Kingdom, New Zealand) and those from European countries (Netherlands, Italy, Greece, there is a growing number of those from Asian countries (Philippines, India, China). These figures are distorted by the almost 50% of the ABS count of people who do not identify as Australian born, nor do they identify their country of birth.

The concepts of cultural diversity are more commonly discussed in the current literature as 'cultural connection'. This provides a much clearer view on the contribution of people from across cultures to contribute equally to the vibrancy of their communities. Where potential residents of the proposed development represent a diverse cultural background, there are existing opportunities within Bairnsdale to engage with the broader community in both employment, education and socio-cultural life. The East Gippsland Shire Council is firmly behind such opportunities for connection through their arts and culture programs and their Council Vision, stated as - "East Gippsland is an inclusive and innovative community".

Retail Services

The proposed development has easy access to Bairnsdale (7.8 Kms). As a regional centre with a combined population across its district of approximately 15,500 (estimated for 2021), Bairnsdale provides a range of retail experiences for current and newly arriving residents. All major supermarket chains (Coles, Woolworths and Aldi) and a range of electrical white goods stores are represented in Bairnsdale and there are a large number of small retail stores that cater to specific shopper needs. Large hardware stores are also available (Bunnings, Dahlsens) with local car dealerships available for most popular model vehicles. There is also a range of businesses that provide repairs and servicing of vehicles, electrical goods, gardening and maintenance for the community.

Digital Communications

Although a relatively new addition to Social Impact Assessment, there is a growing demand for study of the provision of digital connectivity as one of the determinants of where people decide to live and how they function in a new digital age. The growth of home-based work, online education, health monitoring or recreational use, such as video streaming, and the connection to friends, families and the broad, global marketplace will only increase in coming years. Two contributors to the decisions that households make on internet and mobile services are based on their availability and affordability. The following shows the type and coverage of both mobile services and NBN provision for the proposed development.

NBN Fixed Wireless is available to this area, although it requires activation through antenna installation on the premise. Fixed Wireless connections also require a connection box to be installed at the point where the cable from the outdoor antenna enters the premise.

There are two major NBN towers that could provide this service- reception basically determined by the line of sight between the proposed development and the towers.

- NBN Co Site at 180 Mount Lookout Rd Mt Taylor
- NBN Co Site at 170 Deptford Rd Granite Rock

Given the growing numbers of residences that are being approved along Clifton West Road, there may well be a case for Council to seek interest from NBN to instal Fibre To The Node (FTTN) or Fibre To the Premises (FTTP). NBN are always looking to maximise their return on investment and are often attracted to areas where there is a growing consumer market. The proposed development at 240 Clifton West Road would add to that market.

Mobile Coverage

Service providers such as Telstra, Optus and Vodaphone have existing infrastructure that provides mobile service to the proposed development area. The Telstra 4G service is not of consistent strength across the area, due mostly to topographical differences. The pattern of service is provided below[5] and indicates that there are areas with 30-40% signal strength. There may be a need for some households to instal booster equipment to improve their residential mobile signal. Improving signal strength can be requested through Telstra which, given the proposed development will have a potential of 60 or more residences, there is a case for that work to be undertaken.

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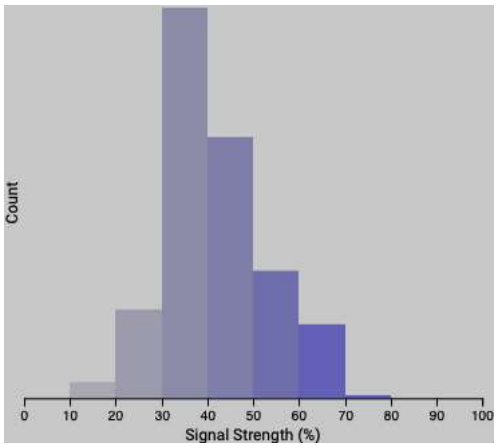
[5] Available at https://www.mobilecoverage.com.au



Social and Community Infrastructure

As discussed above there is no requirement for the proposed development to undertake changes to the existing social/cultural infrastructure. This SIA suggests that because of the proximity to Bairnsdale, a large regional town which has existing and significant socio/cultural infrastructure, there will be no effect on that capacity coming from the relatively small population increase from the proposed development.

However, in order to undertake the approved process for Council the following assessment was completed using only one scenario of population growth. Because of the relatively small population increase there was no need to attempt to project maximum and minimum scenarios as neither would have made any significant impact over the period 2016-2036. The Victoria in Future[6] projections for Bairnsdale and surrounds predict a population increase of 1.3% per annum.

The only element of the assessment that required calculation was the childcare/ kindergarten needs of the Mt Taylor community, from 2016-2036 and then with the additional number of children as outlined above. There was a slight shift in numbers of childcare spaces required over the 20 years.

There is also a requirement of an 'informal playground within 500 metres of all residences' that are justified within the Council SIA Assessment Guidelines. This report suggests that making use of the water management zones to facilitate recreational activity would provide ample areas for experiential play, utilising the natural environment as a source for exploration and engagement.

This is, of course, a prediction based on current statistics and not reflective of the changes that are happening currently and may occur into the next 15 years. The 2021 ABS statistics will reveal new data that may indicate that regional areas will experience continuing growth at a greater rate than predicted

[6] Victoria in Future available at https://www.planning.vic.gov.au/land-use-and-population-research/victoria-in-future

QUANTITATIVE ANALYSIS OF SOCIAL/COMMUNITY INFRASTRUCTURE ACROSS THREE DEMOGRAPHIC SCENARIOS

Facility	Benchmark	Existing Comm'ty	Projected Comm'ty	New Dev't Scenario 1	Total Proj'd	New Dev't Scenario 2	Total Proj'd	New Dev't Scenario 3	Total Proj'd
Early Learning Centres/ Children's Services									
Kindergarten (place)	1 place: 2.2 children aged 4 years (assumes 90% of demand is met by dedicated Council preschools)[1]	2	2	1	3				
Maternal and Child Health (session)	1 EFT Nurse: 140 infants (0 year olds) Equivalent of 1 session: 14 infants (0	< 1	< 1	< 1	< 1				
Long day child care (place)	1 place: 4.8 children aged 0-6	5	5	3	8				
Occasional care	1 place: 28 children aged 0-6	<1	<1	<1	1				
Community Facilities									
Neighbourhood community centre	1 centre: 3,500-15,000 residents	N/A			N/A				
Multipurpose community centre	1 centre: 20,000-30,000 residents	N/A			N/A				
Community meeting room/hall	1 room: 6,000-10,000 residents	N/A			N/A				
Youth space/facility	1 venue: 1: 20,000 residents	N/A			N/A				
Cultural Facilities									
Centre based library	1 static library: 30,000 residents	N/A			N/A				
Community arts venue	1 venue: 60,000 residents	N/A			N/A				
Museum	1 venue: 30,000-130,000 residents	N/A			N/A				
Art Gallery	1: 30,000-150,000 residents	N/A			N/A				
Performing arts venue	1: 50,000-200,000 residents	N/A			N/A				
Civic/cultural space	1: 25,000 residents	N/A			N/A				
Active Recreation Facilities									
District park	1 park: 3,000-5,000 residents. Min of 8ha	N/A			N/A				
Sub-regional park	1 park: 30,000+ residents. Min of 8ha	N/A			N/A				
Football field	1 field: 5,000 residents	N/A			N/A				
Cricket field	1 field: 4,000 residents	N/A			N/A				

Facility	Benchmark	Existing Comm'ty	Projected Comm'ty	New Dev't Scenario 1	Total Proj'd	New Dev't Scenario 2	Total Proj'd	New Dev't Scenario 3	Total Proj'd
Soccer field	1 field: 5,000 residents	N/A			N/A				
Netball Court	1 Court: 7000 residents	N/A			N/A				
Hockey									
Tennis court	1 court: 3,000 residents	N/A			N/A				
Lawn bowls green	1 green: 10,000 residents	N/A			N/A				
Field for lower profile sports	1 field: 15,000 residents	N/A			N/A				
Indoor multipurpose court	1 court: 10,000 residents	N/A			N/A				
Indoor aquatic/leisure centre	1 venue: 60,000 residents	N/A			N/A				
Passive Open Space									
Passive space	1ha: 1000 people	N/A			N/A				
Informal park	Within 500m of every household	YES			YES				
Local/neighbourhood park	1 park: 750-3,000 people, generally min of 1ha	N/A			N/A				
District park	1 park: 3,000-5,000 residents. Min of 2ha	N/A			N/A				
Sub-regional park	1 park: 30,000+ residents. Min of 5ha	N/A			N/A				
Regional park	1 park: 200,000 or 20min drive. Minof 5-10ha	N/A			N/A				
Playgrounds									
Playgrounds	Within 500m of every household	YES			YES				
Playground	1 playground: 250 children aged 0-12 years	N/A			N/A				
Education Facilities									
Government primary students	55% of children aged 5-11								
Government secondary students	47% of children aged 12-17								
Catholic primary students	25% of children aged 5-11								
Catholic secondary students	25% of children aged 12-17								
Independent school students	10% of children aged 12-17								

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people centred planning for change

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