

## **4 PLANNING SCHEME AMENDMENT C235 145 ROSSITER ROAD, KOO WEE RUP SUBMISSIONS AND REQUEST FOR PLANNING PANEL**

FILE REFERENCE INT1968383

RESPONSIBLE GENERAL MANAGER Tracey Parker

AUTHOR Genna Walkley

### **RECOMMENDATION**

That Council:

1. Receive and consider all submissions received during the exhibition of Planning Scheme Amendment C235.
2. Resolves to adopt the recommendations from submissions made by Public Authorities VicRoads and Melbourne Water and modify the amendment documentation for the Planning Scheme Amendment C235.
3. In accordance with Section 23 of the *Planning and Environment Act 1987*, refer all submissions for consideration to an independent planning panel to be appointed by the Minister for Planning.

### **Attachments**

- |   |   |          |
|---|---|----------|
| 1 | Submission Responses to Proposed Amendment C235 | 4 Pages  |
| 2 | Biofilta Stormwater Management Strategy         | 27 Pages |
| 3 | Modified Development Plan Overlay Schedule 22   | 5 Pages  |

### **EXECUTIVE SUMMARY**

The *Koo Wee Rup Township Strategy (2015)* identifies the land located at 145 Rossiter Road, Koo Wee Rup as a residential development investigation area and provides in principle support for a future rezoning of this land to residential, subject to additional land capability assessments being prepared.

A request has been made by the landowner to rezone the land from Farming Zone to Neighbourhood Residential Zone 1, apply the Development Plan Overlay Schedule 22 (DPO22), and correct the mapping of the Heritage Overlay for the adjacent heritage property 'Shepton Mallet'.

The proposed Amendment facilitates the implementation of new planning controls, with the future development of the site, being subject to a planning permit application. The proposal will assist with the facilitation of a future development that will provide:

- Approximately 200 residential lots
- Open space of approximately 1.95ha contained in three parks at varying sizes
- Protection of the Southern Brown Bandicoot corridors
- Retarding basin and constructed wetland
- A tree protection reserve along Rossiter Road
- Shared pathways connecting to the town centre

The Amendment was placed on public exhibition from Thursday 27 June 2019 to Friday 2 August 2019 and during this time, six (6) submissions were received, three (3) from individuals and three (3) from the Public Authorities. One individual submission was withdrawn. Two submissions objected to the Amendment. Two submissions from the Public Authorities requested changes and

have been resolved. As two objecting submissions remain, all submissions should be referred to an independent planning panel to be appointed by the Minister for Planning.

## BACKGROUND

The site is described as Lot 2 on Plan of Subdivision 321029 or 145-165 Rossiter Road, Koo Wee Rup and is approximately 24.4ha, zoned Farming Zone (FZ) and affected by the Land Subject to Inundation Overlay (LSIO), Heritage Overlay (HO), has an area of Aboriginal Cultural sensitivity and is adjacent to a road in a Road Zone - Category 1 (Rossiter Road). See Figure 1.

A request has been made by the landowner to rezone the land.



**Figure 1.** Lot 2 at 145 Rossiter Road, Koo Wee Rup

### The Proposed Amendment

The proposed Amendment rezones the land from Farming Zone (FZ) to the Neighbourhood Residential Zone - Schedule 1 (NRZ1). The NRZ1 is consistent with the current zoning of all residential land in the township and, is also considered an acceptable zone adjoining a Green Wedge Zone (GWZ), allowing for a transition to larger 1000 square metre lots towards the western boundary. It also seeks to apply DPO22 which will identify the form and conditions of future use and development to be shown on a development plan before a permit can be granted to use or develop the land.

The proposed amendment corrects the map for the Heritage Overlay for 'Shepton Mallet' known as HO198 in the Cardinia Planning Scheme's Heritage Overlay as per the heritage assessment undertaken. The assessment recommended a correction to ensure it only applies to the heritage property which is located at Lot 1 of 145 Rossiter Road, Koo Wee Rup and removes it from the subject site.

An assessment of any aboriginal cultural heritage sites at the property identified a moderate size aboriginal cultural heritage site on the north eastern section of the site and recommended its protection and preservation in the open space. However, if disturbance of the site is required during development, a contingency plan is in place and requires the negotiation with the Registered Aboriginal Parties.

The Land Subject to Inundation Overlay (LSIO) will require a referral to Melbourne Water demonstrating the treatment of any flood and water flows, drainage and stormwater. The proposed Amendment demonstrates how to manage flooding and overland flows via the Stormwater Strategy.

DPO22 is proposed to be applied to the site and will assist in facilitating the future subdivision and development of the land which is consistent with the *Koo Wee Rup Township Strategy (2015)*.

DPO22 provides guidance on the location of internal road networks, subdivision layout, staging, open space locations, environment and landscaping, traffic and transport, infrastructure and drainage and urban design and character.

As part of statutory requirements of the Amendment process external referrals were sent to the relevant Referral Authorities and any additional requirements will be added to DPO22.

The proposed Amendment will facilitate the following:

- Approximately 200 residential lots
- Open space of approximately 1.95ha provided by two parks at varying sizes and contains either remnant vegetation or aboriginal cultural heritage site.
- Protection of the Southern Brown Bandicoot corridors
- Retarding basin and constructed wetland
- Tree Protection Reserve
- Shared pathways connecting to the town centre

### **Planning Scheme Amendment**

Specifically, the amendment will:

- Insert Schedule 22 to Clause 43.04 Development Plan Overlay.
- Amend Planning Scheme Map Nos. 26 and 27 rezoning Farming Zone to Neighbourhood Residential Zone Schedule 1.
- Amend Planning Scheme Map No. 27HO to correct HO198, 'Shepton Mallet'.

### **Response to Submissions – Proposed Changes**

*Melbourne Water:*

- 'Site Development Plan – Diagram 1' should be revised to provide sufficient space for the future drainage infrastructure and overland flow path through the site.
- 'Site Development Plan – Diagram 1' should be revised to provide flexibility to the future subdivision plan and lot layout.

*Council Response:* The Site Development Plan – Diagram 1 will be revised to ensure the layout provides sufficient space and design for stormwater infrastructure provision.

*VicRoads:*

- Requires wording changes to the Development Plan Overlay Schedule 22 in the Traffic and Transport section.
- The Site Development Plan does not restrict the location of the site's vehicular access to Rossiter Road to allow for potential variation during the preparation of the relevant traffic and transport material for this Development Plan.

*Council Response:* The modifications sought by the Department of Transport and VicRoads will be integrated into the Development Plan Overlay Schedule 22. The Development Plan will require input from VicRoads and Council when developing the Integrated Transport and Impact Assessment and Traffic Management Plan to determine the appropriate egress and ingress to the site.

### **Amendment Document Changes**

The Development Plan Overlay Schedule 22 has been modified to reflect the changes requested by Melbourne Water and VicRoads including wording changes to the Traffic and Transport section and the Site Development Plan – Diagram 1.

## **POLICY IMPLICATIONS**

### **Plan Melbourne 2017-2050 - Melbourne Metropolitan Planning Strategy**

The relevant directions and policies of Plan Melbourne are as follows:

- Direction 2.2. *Deliver more housing closer to jobs and public transport*
- Policy 2.2.5. *Require development in growth areas to be sequences and stages to better link infrastructure delivery to land release.*
- Direction 2.5. *Provide greater choice and diversity of housing*
- Policy 2.5.1. *Facilitate housing that offers choice and meets changing household needs*

### Planning Policy Framework

- *Clause 11 Settlement* - to promote the sustainable growth and development of Victoria and deliver choice and opportunity for all Victorians through a network of settlement.
- *Clause 12 Environmental and landscape values* - to protect the health and ecological systems and the biodiversity they support and conserve areas with identified environmental and landscape values.
- *Clause 13 Environment risks and amenity* - to avoid and minimise environmental degradation and hazards. Planning should identify and manage the potential for the potential impact for the environment, and environmental changes, to impact upon the economic, environmental or social wellbeing of society.
- *Clause 14 Natural resource management* - to assist in the conservation and wise use of natural resources including energy, water, land, stone and minerals to support both environmental quality and sustainable development.
- *Clause 15 Built environment and heritage* - ensure all new land use and development appropriately responds to its surrounding landscape, valued built form and cultural context, and protect places and sites with significant heritage, architectural, aesthetic, scientific and cultural value.
- *Clause 16 Housing* - provide for housing diversity, and ensure the efficient provision of supporting infrastructure.

### RELEVANCE TO COUNCIL PLAN

#### 3. Our Environment

3.5. *Balanced needs of development, the community and the environment*

3.5.2. Plan for the development of the urban growth area with a mix of residential, commercial, employment, recreational and community activities to meet the needs of our growing community in a sustainable way.

### CONSULTATION/COMMUNICATION

The intention to rezone 145 Rosstier Road was identified by the *Koo Wee Rup Township Strategy (October 2015)* which was exhibited to the community via Planning Scheme Amendment process C189 in March 2016.

Amendment C235 was placed on public exhibition from Thursday 27 June 2019 to Friday 2 August 2019. All owner/occupiers, community groups and the relevant public authorities were notified of the exhibition of the Amendment and a total of 222 letters and 42 emails were sent.

In addition to the above, the Amendment was promoted using the following methods:

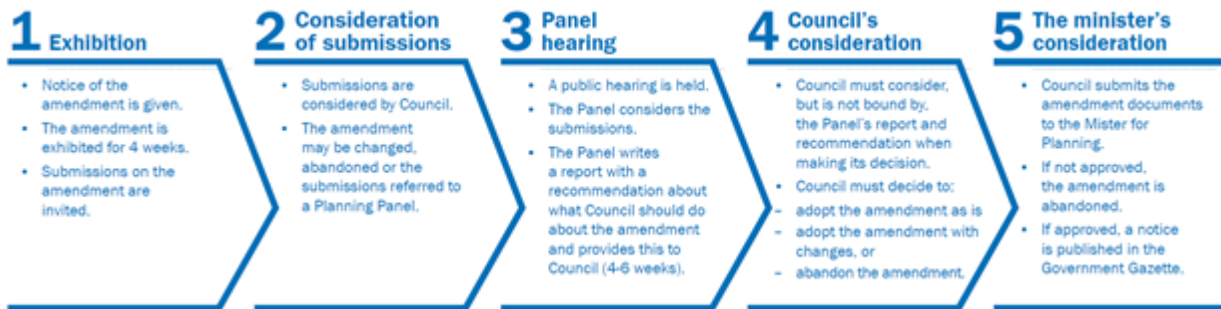
- Notice in the Pakenham Gazette - 26 June 2019
- Notice in the Government Gazette - 27 June 2019
- Relevant Council departments notified
- Cardinia Shire Council website
- Cardinia Shire Council Facebook page



- Media release
- DELWP website
- Presentation to the Koo Wee Rup Township Committee – Wednesday 3 July 2019
- C235 Amendment documents were made available at the Cardinia Shire Council Civic Centre customer service desk.

At the conclusion of the public exhibition period, six (6) submissions were received, with two (2) objecting to the Amendment. A summary of the submissions and Council's response is detailed in Attachment 1.

**Next Steps**



**Figure 2. Steps in the Planning Scheme Amendment process**

We are at **Stage 3** of the Planning Scheme Amendment process as detailed above in Figure 1. Once the Planning Panel has been appointed, a panel hearing is scheduled to occur in the week of 18 November 2019. Following the panel hearing, the panel will prepare a report that will be put forward to Council at a future Council meeting outlining a recommendation as to how to proceed with the Amendment.

**FINANCIAL AND RESOURCE IMPLICATIONS**

There are no additional resource implications associated with undertaking the Planning Scheme Amendment and costs associated with this process are paid for by the proponent of the amendment. The rezoning and application of DPO22 Overlay provides a clear framework to assist Council planners when assessing and making decisions for the subject site.

**CONCLUSION**

The Amendment was placed on exhibition from Thursday 27 June 2019 to Friday 2 August 2019. Six (6) submissions in response to the Amendment were received:

- Submission No. 2 was withdrawn.
- Submission No. 4 was supportive.
- Submission No. 5 and 6 (VicRoads and Melbourne Water) was supportive, requested changes and have been resolved.
- Submission No. 1 and 3 objected the amendment and remains unresolved.

It is recommended that Council in accordance with Section 23 of the *Planning and Environment Act 1987*, refer all submissions that could not be resolved for consideration to an independent planning panel to be appointed by the Minister for Planning.

**Acronyms/Definitions**

DPO – Development Plan Overlay

Panel – Victorian Planning Panel

**Individual Submissions**

Sub #	Position	Submission Summary	Council officer Response	Recommendation for Panel Hearing
1	Objection	Congestion, truck and traffic issues along Rossiter Road.	<p>A Traffic Impact Assessment will need to be prepared to the satisfaction of Council and VicRoads as per the requirements of the Development Plan Overlay Schedule 22.</p> <p>Rossiter Road is identified as a Road 1 Zone in the Cardinia Planning Scheme. This road is the responsibility of and managed by VicRoads. Any additional traffic impacts by the future development will require mitigation resulting in appropriate traffic management techniques along Rossiter Road. These may include traffic slowing techniques, turning lanes or signalised intersections.</p>	<p>No change to amendment.</p> <p>Refer submission to a Panel.</p>
2	Withdrawn	Submitter requests the rezoning and subdivision of their own property located in Bayles.	The property location is well beyond the subject site and the submission does not relate to the Amendment.	Submission withdrawn.
3	Objection	<p>Overarching issue: concerns about flooding</p> <ol style="list-style-type: none"> <li>1. Likely increase in flooding neighbouring properties including their own.</li> <li>2. Land levels will be increased and the drainage not sufficient enough to take away the stormwater.</li> <li>3. Increases land levels on both sides of Rossiter Road make the area more prone to flooding, example: Shelton and Waterways estates.</li> <li>4. A thorough and full community discussion is required to address the drainage issues in the area should be addressed along Rossiter road, prior to any new lots being</li> </ol>	<ol style="list-style-type: none"> <li>1. The Development Plan Overlay Schedule 22 requires: A <b>Stormwater Management Plan</b> to be carried out to the satisfaction of the Water Authority incorporating a hydrogeological assessment, water sensitive urban design principles and a drainage and servicing assessment address all relevant drainage, flooding and water quality issues.</li> <li>2. See comment 1 above.</li> <li>3. A <b>Fill Plan</b> in conjunction with the Stormwater Management Plan is to be carried out to fulfil the requirements of the Development Plan as per Schedule 22 to Clause 43.03.</li> <li>4. This phase of the Amendment process provides the community an opportunity to provide a submission to the Amendment and the process. The Development Plan will be advertised providing the community another opportunity to review and comment on the future</li> </ol>	<p>No change to amendment.</p> <p>Refer submission to a Panel.</p>

Sub #	Position	Submission Summary	Council officer Response	Recommendation for Panel Hearing
		constructed along Rossiter Road to alleviate the flooding issue.	development prior to being approved. 5. Biofilter Pty Ltd has previously prepared a Stormwater Management Plan (SWMP) was submitted to Council as part of earlier iterations of the amendment / planning report as identified in the Council Report for General Council Meeting on 10 December 2018 (Attachment 2). An update report will be required to fulfil the requirements of the Development Plan as per Schedule 22 to Clause 43.04.	

#### External Referral Authorities

External Referral Authority	Position	Submission Summary	Council Officer Response	Amendment Document Changes	Recommendation for Panel Hearing
South East Water	Support	South East Water as the Water Supply and Sewerage Authority has no objection to the proposed amendment of the Planning Scheme.	Noted.	No change to amendment.	Not applicable.
Melbourne Water	Support	Overall supportive of the amendment. Further clarification on proposed layout is required to cater for Melbourne Water's hydraulic and asset protection requirements: <u>Site Layout</u> 1. Update the Stormwater Management Plan to be consistent with the Site Development Plan – Diagram 1' Shown in the proposed Schedule 22 to Clause 43.03 Development Plan Overlay. 2. Ensure the site of the reserve/constructed wetland and sediment basin in the Site Development Plan – Diagram 1	The modifications sought by Melbourne Water to the Development Plan Overlay Schedule 22 will be integrated.  1. The Stormwater Management Plan will be updated for the Development Plan stage being consistent with and generally in accordance with the Site Development Plan – Diagram 1 in schedule 22 to Clause 43.03 Development Plan Overlay. 2. The Site Development Plan – Diagram 1 in schedule 22 to Clause 43.03 Development Plan	Site Development plan – Diagram 1 in Schedule 22 to Clause 43.03 updated as per Melbourne Water's recommendations.	Melbourne Water correspondence is satisfied with the response and proposed changes to Amendment Documentation.  Resolved.

External Referral Authority	Position	Submission Summary	Council Officer Response	Amendment Document Changes	Recommendation for Panel Hearing
		<p>should be consistent and revised to provide sufficient space</p> <p><u>Hydraulic Calculations</u></p> <ol style="list-style-type: none"> <li>3. Increase the flood storage volume from a 30 minute to a 90 minute storm duration.</li> <li>4. Changes may result in a re-design of the subdivision layout.</li> <li>5. Melbourne Water will not consider flood storage volume below Normal Water Level (NWL) of Wetland.</li> <li>6. More detail is required to prove no afflux is associated with the proposed scenario.</li> <li>7. Wetland must be clear draining.</li> </ol> <p><u>Asset protection objectives</u></p> <ol style="list-style-type: none"> <li>8. Growling Grass Frog habitat/protection must be set outside of this 10 metre setback from the drain.</li> </ol> <p><u>Stormwater Outlet Design</u></p> <ol style="list-style-type: none"> <li>9. Any new connection proposed to Melbourne Water's Southern Boundary Drain must be constructed in accordance with our stormwater connection guidelines. Information is required to demonstrate how this connection will be constructed and how water will be conveyed across the Koo Wee Rup South Drain (local drainage asset) and into the Southern Boundary Drain (Melbourne Water Asset).</li> <li>10. A floodgate on the outlet of the</li> </ol>	<p>Overlay will be updated to reflect the area required for future drainage infrastructure.</p> <ol style="list-style-type: none"> <li>3. The 'Stormwater Management Plan' will be updated at the Development Plan stage pursuant to the DPO Schedule and requirements/conditions of Melbourne Water.</li> <li>4. Noted. The Site Development Plan – Diagram 1 will be updated to provide flexibility.</li> <li>5. See Comment 3 above.</li> <li>6. See Comment 3 above.</li> <li>7. See Comment 3 above.</li> <li>8. See Comment 3 above.</li> <li>9. See Comment 3 above.</li> <li>10. See Comment 3 above.</li> <li>11. Noted. The Site Development Plan – Diagram 1 will be updated to provide flexibility of infrastructure provision and subdivision layout.</li> </ol>		



External Referral Authority	Position	Submission Summary	Council Officer Response	Amendment Document Changes	Recommendation for Panel Hearing
		<p>wetland should be built in order to avoid backflow from the southern boundary drain associated with a storm surge event.</p> <p><u>Development Plan Overlay Schedule 22</u> 11. 'Site Development Plan - Diagram 1' should be revised to provide sufficient space for the future drainage infrastructure and overland flow path through the site.</p>			
Department of Transport	Support	<p>Overall supportive of the amendment.</p> <p>Requires changes to the Development Plan Overlay Schedule 22 wording in the <b>Traffic and Transport</b> section and more flexibility in the entry point as indicated by the Site Development Plan - Diagram 1.</p> <p>The Site Development Plan provides flexibility for the ingress and egress of the site's vehicular access to Rossiter Road to allow for potential variation during the preparation of the relevant traffic and transport material for this Development Plan.</p> <p>Be mindful of the Road 1 Zone adjacent to the subject site located on the west.</p>	<p>The modifications sought by the Department of Transport and VicRoads to the Development Plan Overlay Schedule 22 will be integrated.</p> <p>A range of Traffic Assessments are required to inform the Development Plan. These assessments will require VicRoads input as per the Development Plan Overlay Schedule 22:</p> <ul style="list-style-type: none"> <li>• An Integrated Transport and Impact Assessment</li> <li>• A Traffic Management Plan</li> </ul>	<p>Site Development plan - Diagram 1 in Schedule 22 to Clause 43.03 updated as per VicRoads's recommendations.</p> <p>Update and change the wording in the <i>Traffic and Transport</i> section of Schedule 22 to the Development Plan Overlay as per VicRoad's recommendations.</p>	<p>VicRoads correspondence is satisfied with the response and proposed changes to Amendment Documentation.</p> <p>Resolved.</p>



Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

# Rossiter Road

## Stormwater Management Plan

Prepared for: Brosnan Engineering P/L  
25 July 2017



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

## Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>4</b>
<b>2</b>	<b>Site Description</b> .....	<b>4</b>
2.1	Site Inspection.....	6
2.2	Proposed Development.....	8
2.3	Stormwater Objectives .....	9
<b>3</b>	<b>Site Hydrology</b> .....	<b>9</b>
3.1	External Flows – Melbourne Water Flood Advice .....	9
3.2	Koo Wee Rup Flood Protection District Guidelines .....	11
3.3	Hydraulic Data Used for Calculations.....	13
3.4	Hydraulic Calculations.....	14
3.4.1	Existing conditions.....	14
3.4.2	Developed Conditions.....	15
<b>4</b>	<b>External Flooding</b> .....	<b>18</b>
4.1	Existing Flood Conditions.....	18
4.2	Developed Case Flood Interaction.....	21
<b>5</b>	<b>Water Quality Treatment</b> .....	<b>23</b>
5.1	Model Setup.....	23
5.2	Rainfall Data.....	23
5.3	MUSIC Layout.....	24
5.4	MUSIC Results.....	25
<b>6</b>	<b>Recommendations</b> .....	<b>26</b>
	Figure 1: Site.....	4
	Figure 2: Site Survey.....	5
	Figure 3: Site Pic from north eastern boundary looking west .....	6
	Figure 4: Site Pic from north eastern boundary looking west .....	6
	Figure 5: Upstream side of Southern Boundary drain flowing through disused railway culvert .....	7
	Figure 6: Proposed Development Layout .....	8
	Figure 7: External Flood flows from Melbourne Water .....	10
	Figure 8: Flood Zones in Koo Wee Rup .....	12
	Figure 9: IFD Data.....	13
	Figure 10: Existing 5 and 100 year ARI flows.....	14
	Figure 11: Developed 5 and 100 year flows .....	15



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

Figure 12: Basin Model XPStorm ..... 16  
 Figure 13: Retarded 5 and 100 year flows ..... 17  
 Figure 14: Retardation basin depth for 5 and 100 year flows ..... 17  
 Figure 15: Existing model and Lidar background ..... 18  
 Figure 16: 2D flood flow results ..... 19  
 Figure 17: Existing Flood level ..... 19  
 Figure 18: Existing Flood level at downs stream end of site..... 20  
 Figure 19: Developed 2D model..... 21  
 Figure 20: Developed 2D model results ..... 22  
 Figure 21: Developed 2D model Cross Section with filling and shaping..... 22  
 Figure 22: Rainfall and evaporation pattern ..... 24  
 Figure 23: Rainfall and Evaporation Summary..... 24  
 Figure 24: Treatment Train Model..... 25  
 Figure 25: Best Practice Outcomes..... 26

Document Control

Version	Date	Description	Prepared	Reviewed
REV 1	23 July 2017	Issue	MN	

*Copyright Biofilta Pty Ltd. All Rights Reserved. Copyright in the whole and every part of this document belongs to Biofilta Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person without the prior written consent of Biofilta Pty Ltd.*



Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

## 1 Introduction

Biofilta Pty Ltd was engaged by Brosnan Engineering P/L to address the stormwater management requirements of a proposed residential development at 145 ROSSITER ROAD KOO WEE RUP.

This report details the stormwater management proposal for the development that will address the issues of:

- Flood management of external flows in the 1 in 100 year AEP
- Minor and major storm treatment and retardation
- Proposed filling of the site to provide immunity to flooding
- Water quality treatment to Best Practice Environmental Standards

## 2 Site Description

The subject site is located at 145 Rossiter Road, Koo Wee Rup and is bounded to north by a disused railway embankment, to the east by the Koo Wee Rup hospital, to the south by Rossiter road, west by an unmade government road and open field and to the north west by the Southern Boundary Drain as shown in Figure 1 below.



Figure 1: Site







Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

## 2.1 Site Inspection

Biofilta visited the site and noted that the area is currently open grassed farmland with evidence of grazing cows on the site. There are almost no internal features on the site.



Figure 3: Site Pic from north eastern boundary looking west

Along the northern boundary, a small concrete channel exists at the toe of the disused railway embankment.



Figure 4: Site Pic from north eastern boundary looking west

The drain is currently overgrown and very hard to access and takes flows from a small catchment to the east.



Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

At the western boundary is a culvert system under the disused railway line. The Southern Boundary Drain flows under the disused railway line as shown below:



**Figure 5: Upstream side of Southern Boundary drain flowing through disused railway culvert**



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

## 2.2 Proposed Development

It is proposed that the property be rezoned to accommodate residential development.

A preliminary lot layout from Brosnan Engineering shows a lot layout with up to 213 lots ranging from 510m<sup>2</sup> to 1,058m<sup>2</sup> with the dominant lot size between 700m<sup>2</sup> and 820m<sup>2</sup> as shown in Figure 3 below:

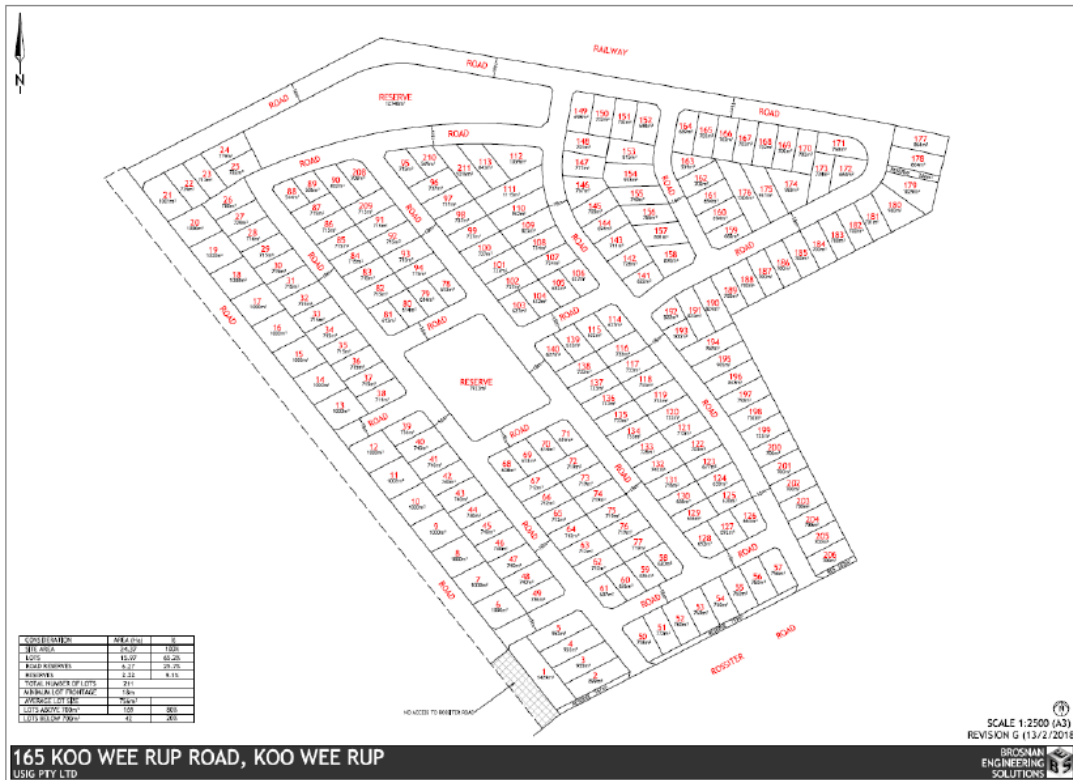


Figure 6: Proposed Development Layout

The Development will include:

- Total site are of 24.3ha
- 213 lots
- Park reserve in the south east
- Drainage reserve to the north west
- Road layout





Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

## 2.3 Stormwater Objectives

The objectives for stormwater management on the site are:

- Comply with Melbourne Water flooding conditions
- Ensure that external flows can pass without afflux created by the development
- Retard flows from the developed scenario back to the predeveloped flow rate via onsite detention systems for all flows up to the 1 in 100 year AEP
- Treat stormwater runoff to Best Practice water sensitive urban design ( WSUD ) standards

The main objectives for WSUD are:

To achieve the best practice water quality performance objectives as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999 (as amended). Currently, these water quality performance objectives are:

- ✓ Suspended Solids - 80% retention of typical urban annual load;
- ✓ Total Nitrogen - 45% retention of typical urban annual load;
- ✓ Total Phosphorus - 45% retention of typical urban annual load; and
- ✓ Litter - 70% reduction of typical urban annual load.

## 3 Site Hydrology

### 3.1 External Flows – Melbourne Water Flood Advice

Flood advice provided by Melbourne Water on 15<sup>th</sup> April 2016 stated that the applicable maximum flood level for the site is RL 4.6m AHD.

**Property:** 145 ROSSITER ROAD KOO WEE RUP 3981  
**Applicant Ref:** 21819601-028-8  
**Melb Water Ref:** 272265

#### Flood Level Information

The property is located in Zone 2 of the Koo Wee Rup Flood Protection District. The estimated flood level that has a probability of occurrence of 1% in any one year is 700mm above the natural ground surface or 4.6 metres to Australian Height Datum, whichever is the greater.

Given the flood advice, the site is generally subject to flooding across the entire property.

Biofilta further investigated the external flooding conditions for the site and were advised that the Southern Boundary drain has a peak 1 in 100 year AEP flow of 40m<sup>3</sup>/s which must be accommodated and that there is a flow of 1.1m<sup>3</sup>/s from the eastern catchment which flows along the toe of the railway embankment towards the Southern Boundary drain.





Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

A flood map summary of external flows is shown below:

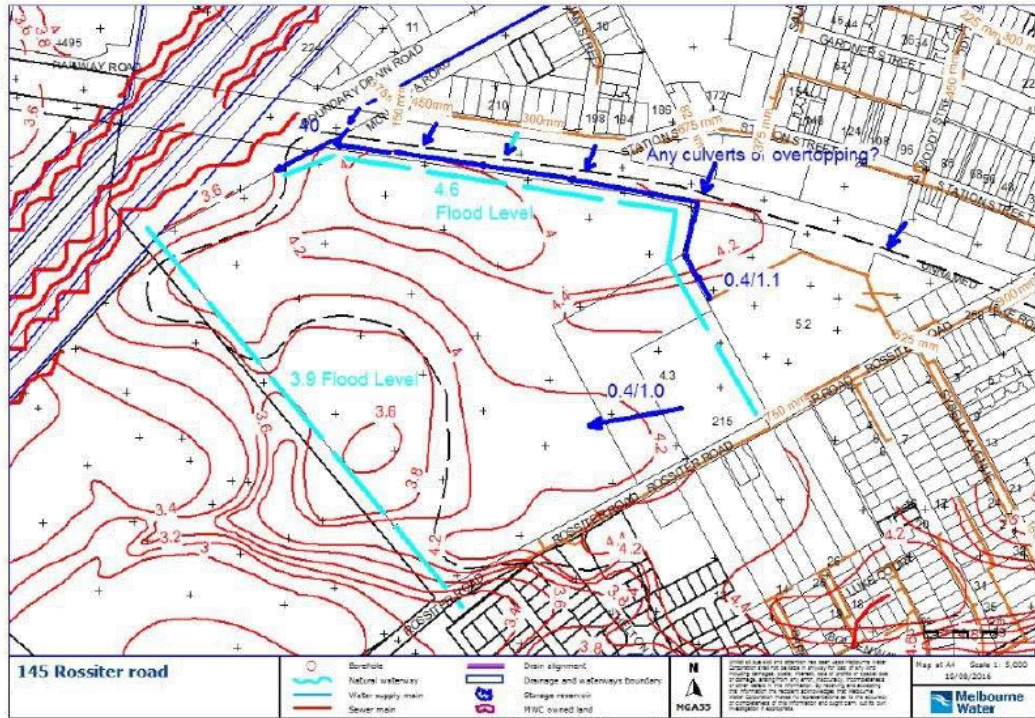


Figure 7: External Flood flows from Melbourne Water

External flows indicated in Figure 7 show that the flood level grades from 3.9 in the south to 4.6 in the north west.



Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

### 3.2 Koo Wee Rup Flood Protection District Guidelines

The subject site is also located within a designated flood protection area for Koo Wee Rup published by Melbourne Water in 2003.

The KWRFPD lies in what was originally known as the Koo Wee Rup Swamp, which was formed from a tectonically depressed basin between the Tyabb and Heath Hill Faults and covers an area of approximately 400km<sup>2</sup>.

The Swamp was fed by a catchment 2208km<sup>2</sup> in area that included the three major drainage basins of Cardinia Creek, Bunyip River and Lang Lang River catchments. Prior to European Settlement, the Yallock Creek formed the only permanent outlet from the swamp into the Western Port Bay. In the late 19th century the swamp was slowly drained with a network of constructed channels and improved outfalls to Western Port.

Today, the drainage system that includes the two main carrier drains (the Cardinia Outfall Drain and the Bunyip Main Drain) provides a relatively high level of flood protection for a rural area and, allows intense and productive agricultural activities. These main carrier drains will take flows from a storm event of an intensity experienced once every 7 years in some locations and 15 years in other locations.

Following the 1934 flood and regular flooding of the district, construction of the Yallock Outfall commenced in the 1950s. The outfall splits the flow of the Bunyip Main Drain at Cora Lynn and thus provides flood protection from the overtopping of the Bunyip Main Drain for the Koo Wee Rup Township.

Flooding in the district results from not only the overtopping of the main carrier levees but also as a result of floodwaters from the local catchments exceeding the capacity of the local drainage system. Flooding within the district is characterised by large areas of water pondage, particularly behind raised roads and levees. Due to the extremely flat nature of the terrain, even relatively minor events can inundate large areas within the district.



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

## Flooding Zones within KWRFPD

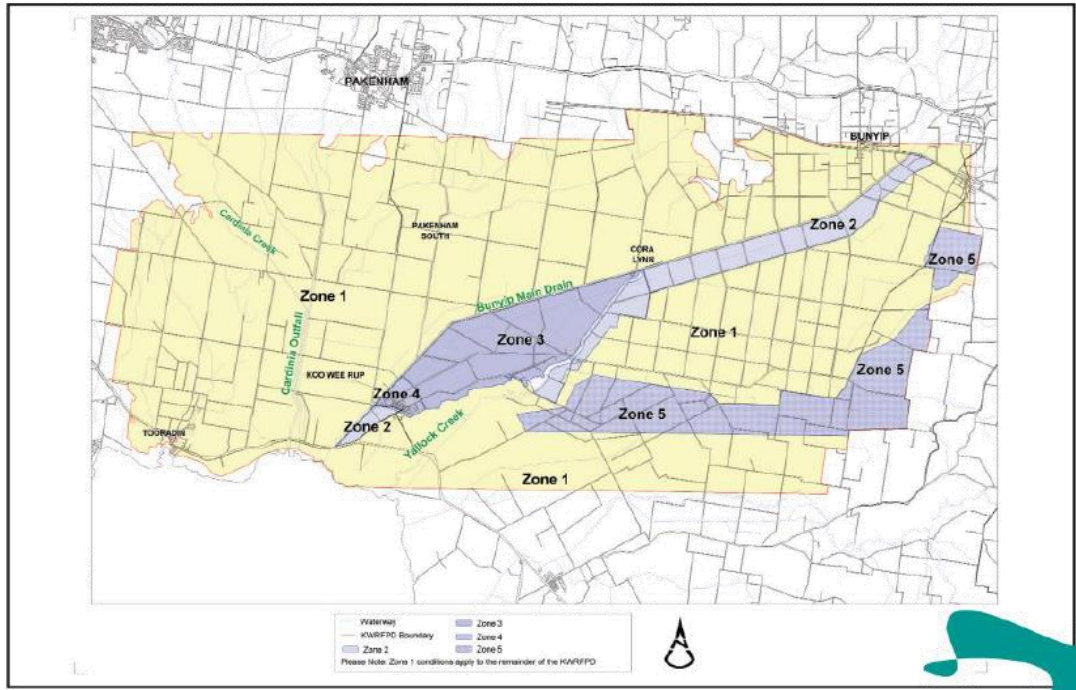


Figure 8: Flood Zones in Koo Wee Rup

From Figure 8, the subject site is located in Zone 2 which indicates that the area is liable to deep flooding as a result of concentrated overflows from a major drain.

Requirements of development in Zone 2, are noted as:

- Floor levels of any new dwelling to be a minimum of 600mm above the applicable flood level; however, building may not be permitted where the depth is more than 500mm.
- A fill pad that extends at least 5m beyond the building and a minimum of 150mm above the flood level.
- Outbuildings may have floor levels 300mm above the flood level for concrete floors

Further, fill pads for allotments measuring between 800m<sup>2</sup> and 1ha require a fill pad that covers the entire building envelope and if a building is not specified then the Plan of Subdivision should include this envelope.

Access to properties should also aim to provide the roads that do not flood more than 350mm deep or have a product of velocity x depth of no more than 0.35



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

### 3.3 Hydraulic Data Used for Calculations

The site is located at 38.200S and 145.475 E.

The Bureau of Meteorology advises the following rainfall intensities from the site location:

RAINFALL INTENSITY IN mm/h FOR VARIOUS DURATIONS AND RETURN PERIODS

DURATION	RETURN PERIOD (YEARS)						
	1	2	5	10	20	50	100
5 mins	44.2	50.9	80.8	95.8	116.	145.	169
6 mins	41.3	55.0	75.3	89.1	108	135	157
10 mins	33.6	44.6	60.4	71.1	85.5	106	123
20 mins	24.4	32.1	42.6	49.6	59.0	72.4	83.4
30 mins	19.8	26.9	33.9	39.2	46.4	56.5	64.8
1 hour	13.3	17.3	22.3	25.6	30.1	36.4	41.5
2 hours	8.66	11.2	14.4	16.5	19.3	23.2	26.4
3 hours	6.71	8.70	11.1	12.7	14.9	17.9	20.3
6 hours	4.31	5.59	7.15	8.16	9.54	11.5	13.0
12 hours	2.75	3.57	4.57	5.22	6.10	7.34	8.34
24 hours	1.73	2.24	2.87	3.28	3.84	4.62	5.26
48 hours	1.04	1.35	1.74	1.99	2.33	2.81	3.21
72 hours	.751	.981	1.26	1.45	1.70	2.06	2.35

Figure 9: IFD Data

The time of concentration for the existing site is estimated for rural flows by the Adams equation to be 26.6 minutes for a catchment area of 24.3ha.

$T_c = 26.6$  minutes ( only used for Rational Method calculations )

Catchment slope: 0.8m fall across 660m = 0.0012 m/m ( used in non-linear model )

Fraction impervious ( existing ) = 0  
 Fraction pervious = 100%

Runoff coefficients recommended by Melbourne Water are:

Land use	C (5 Year ARI)	C (100 Year ARI)
Major open space	0.20	0.30
Residential (avg lot size):		
4000 m <sup>2</sup>	0.30	0.40
750 m <sup>2</sup>	0.40	0.50
500 m <sup>2</sup>	0.50	0.65
350 m <sup>2</sup>	0.60	0.75
< 350 m <sup>2</sup>	0.70 to 0.90	0.9
Major road reserves	0.50 to 0.80	0.65 to 0.9
Commercial/Industrial	0.70 to 0.90	0.9

Table 2 - Runoff coefficients

Based on the average lot size being approximately 750m<sup>2</sup>, we will adopt C values of:  
 $C_5 = 0.4$  and  $C_{100} = 0.5$   
 Open space values are 0.2 and 0.3 for the  $C_5$  and  $C_{100}$  ARI's respectively.





Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

### 3.4 Hydraulic Calculations

#### 3.4.1 Existing conditions

Based the parameters in Section 3.3, for the Rural predevelopment flow, a Rational Method calculation provides:

The peak pre-development flows for the 5 year and 100 year storms:

$$Q = CIA/360$$

where C = 0.2 for the 5yr and 0.3 for 100yr ARI  
 I = 36.3 for the 5yr and 69.9 for 100yr ARI

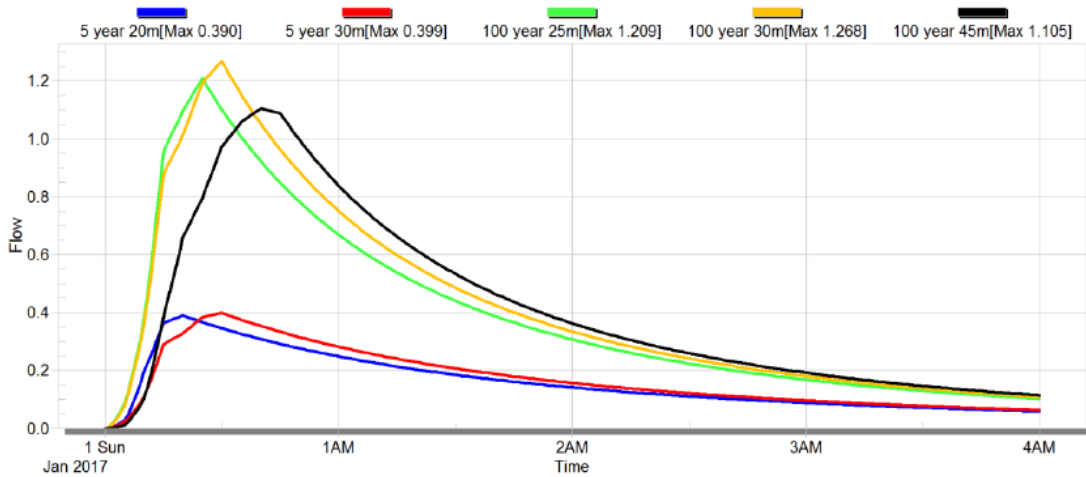
$$Q_{5predev} = 0.49m^3/s$$

$$Q_{100predev} = 1.415m^3/s$$

The Rational Method is a linear, quick method that does not take into account a range of factors and is being phased out by ARR as a reliable design tool for hydrology.

Biofilta have included the Rational Method as a check only.

Based on XPStorm and the SWMM method with input parameters from Section 3.3 we find:



Peak discharges in the 5 and 100 year existing scenario are reasonably close to the rational method check values.





Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

For this report, we adopt the values of existing flow from the site as:  
 C5 = 0.395m<sup>3</sup>/s and C100 = 1.27m<sup>3</sup>/s

To provide a no-worsening effect, it is desirable to provide detention to limit flows to existing conditions.

First, developed flows need to be calculated.

### 3.4.2 Developed Conditions

Using XPStorm, developed flows for the site will assume an overall fraction imperviousness of 0.6 given the larger lot sizes.

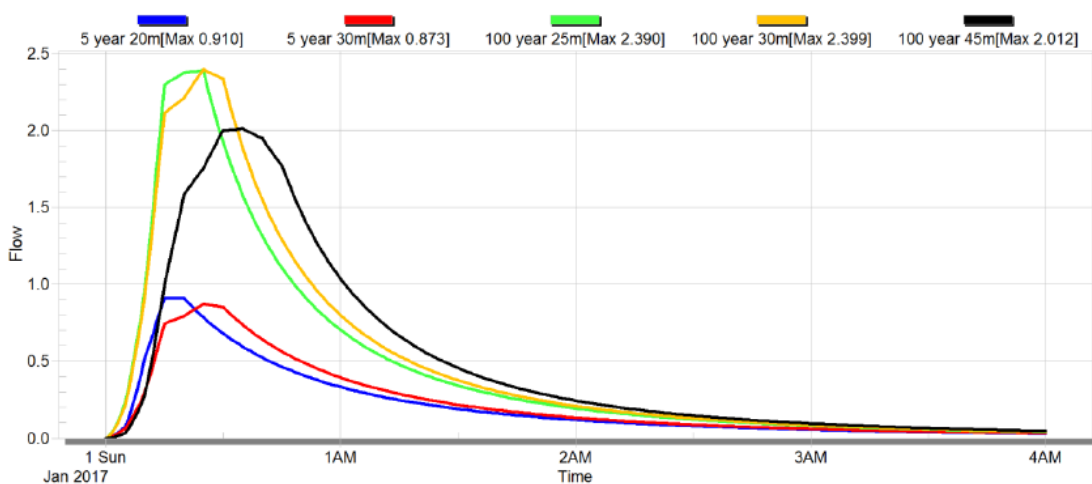


Figure 11: Developed 5 and 100 year flows

From the developed flows, we adopt the values:

Q5dev = 0.9m<sup>3</sup>/s  
 Q100deve = 2.39m<sup>3</sup>/s



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

In summary, the existing and developed flows for the site are:

ARI	Existing m3/s	Developed m3/s
5 year	0.395	0.9
100 year	1.27	2.39

To achieve the objective of matching pre-development flows entering the downstream waterway, detention is required to restrict the flows to these values.

A precinct wetland / retarding basin is proposed for the site in the reserve area in the north west corner of the site.



Figure 12: Basin Model XPStorm

XPStorm was used to model flows entering a retarding basin / wetland with a restricted outlet via an orifice plate to provide retardation of storms to predevelopment levels.

The basin was conceptually sized as having a base area of 3,000m<sup>2</sup> and a top water area at 1.5m depth of 3,500m<sup>2</sup> providing a maximum retardation volume of 4,875m<sup>3</sup>.

An initial invert level of 3m AHD was chosen for the retarding basin to provide an outlet to the downstream Southern Boundary Drain which has an invert of approximately 2.2m AHD.



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

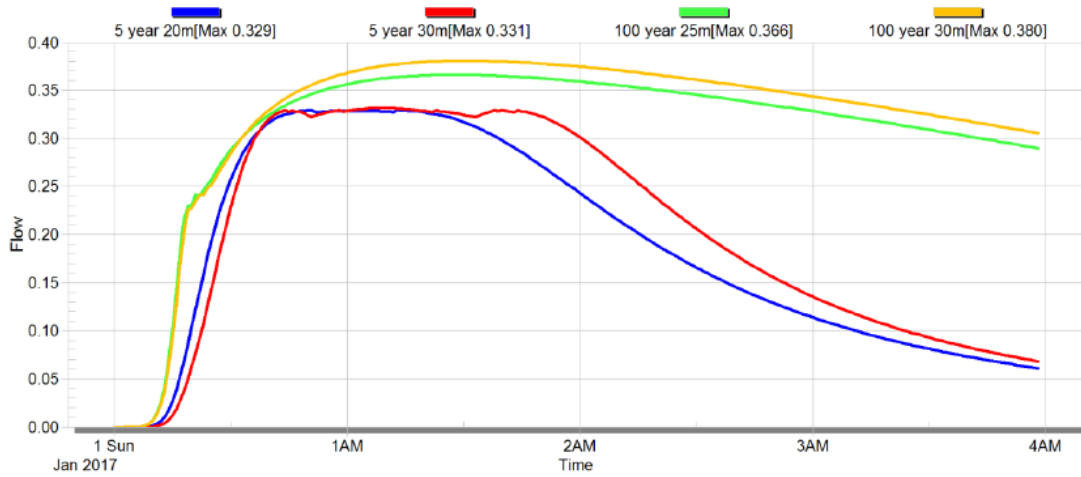


Figure 13: Retarded 5 and 100 year flows

The control pipe orifice size is a 400mm diameter pipe to the legal point of discharge.

Figure 12 shows that the 400mm pipe retards flows for the 5 and 100 year ARI to below predevelopment levels.

The basin level ( node 8 ) reaches a maximum depth of 1.42m for the 100year ARI as shown below:

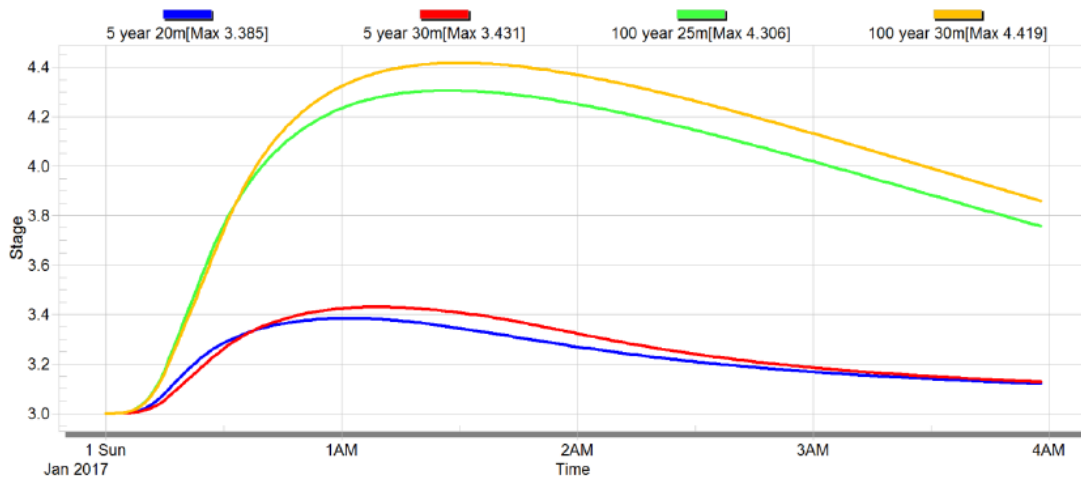


Figure 14: Retardation basin depth for 5 and 100 year flows

From Figure 14, the full 100 year ARI volume is contained within the basin as spill height of RL 4.5m AHD is not reached.



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

## 4 External Flooding

The site and general area is subject to flooding from 1 in 100 year AEP events via overtopping of the Southern Boundary Drain.

Through liaison with Melbourne Water ( Keith Boniface ), the following key considerations were required to be shown for the developed case:

1. Model overflow of Southern Boundary Drain into property using 2D analysis to demonstrate the flood levels will not be affected for the peak 100 year ARI of 40m<sup>3</sup>/s
2. Adopt a roughness of 0.055 for the site to account for various roughness factors
3. Provision of flow path should be incorporated in the shaping of the site along the western boundary to allow flows to pass

### 4.1 Existing Flood Conditions

Lidar survey was obtained for the site to accurately depict the terrain for the site and a 2D model was constructed for site in an existing and developed condition.

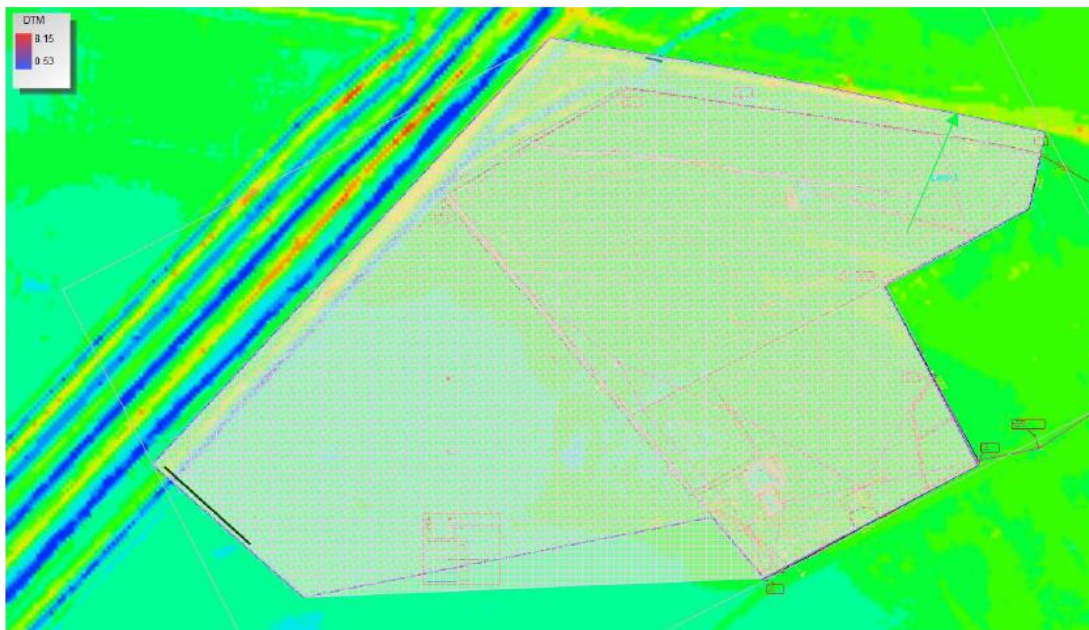


Figure 15: Existing model and Lidar background

From Figure 15, an inflow was applied to the upstream ( northern boundary ) with a triangular hydrograph peaking at 40m<sup>3</sup>/s over 4 hours and routed through the channel and surface.

The grid was schematised with landuse roughness values suggested by Melbourne Water at 0.055 mannings roughness.





Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

Outlet conditions downstream of the site were assumed to be lower than ground level to ensure that the model did not artificially pond water.

Results of the peak flow in the exiting scenario are shown below:

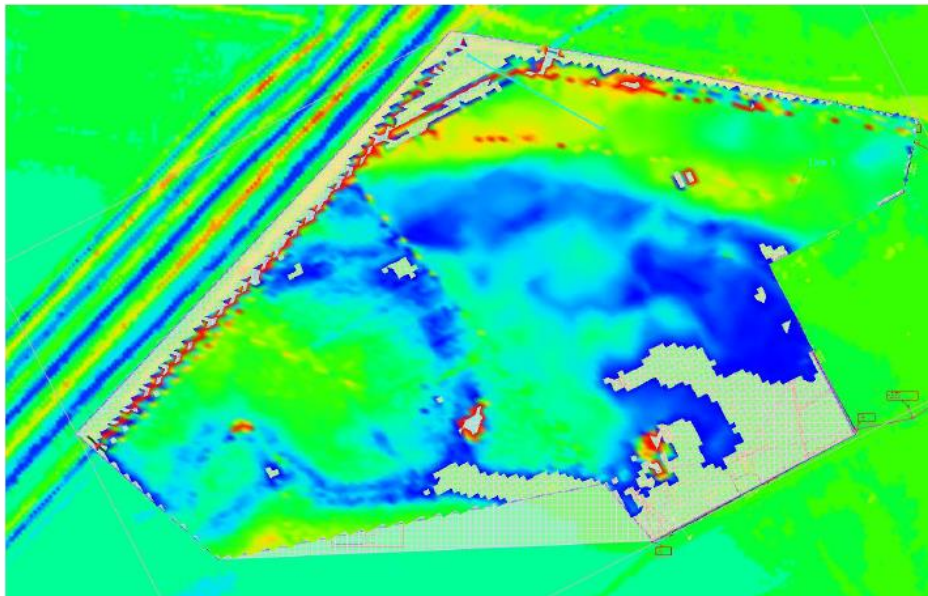


Figure 16: 2D flood flow results

A cross section was taken at the upstream end of the site and adjacent to the downstream end of the Southern Boundary Drain railway culvert. Figure 16 shows the cross section location and Figure 17 below shows the flood level against true ground:

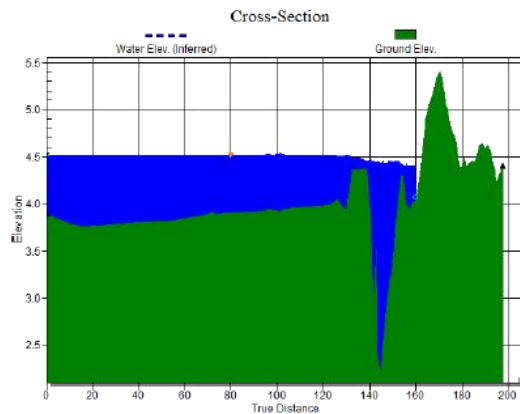


Figure 17: Existing Flood level



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

From Figure 17, the Flood level of 4.6m AHD was achieved and matches with Melbourne Water’s flooding advice for the site. This indicates that the 2D model is in close calibration with Melbourne Water’s flood mapping.

At the downstream end of the site, the 2D flooding is:

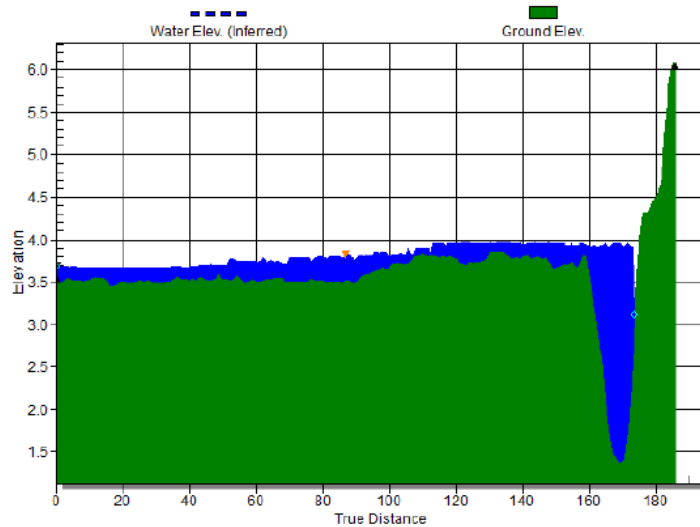


Figure 18: Existing Flood level at downs stream end of site

Comparison with Figure 7, the flood level at the downstream end of the site also matches with Melbourne Water’s graded flood level of 3.9m AHD.

Hence, the existing flooding conditions modelled for the site are in agreement with Melbourne Water’s flood mapping and any changes for the developed scenario can now be applied with confidence.





Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

## 4.2 Developed Case Flood Interaction

The developed case was modelled as a full site fill with an area excavated to represent the retarding basin and further shaping along the western boundary to better enable flood flows to pass along the western boundary.

The Southern Boundary drain was also modelled in finer detail as a 1D channel system and flows are able to pass in and out of the 1D channel and onto the 2D grid surface.

The developed scenario is shown below:

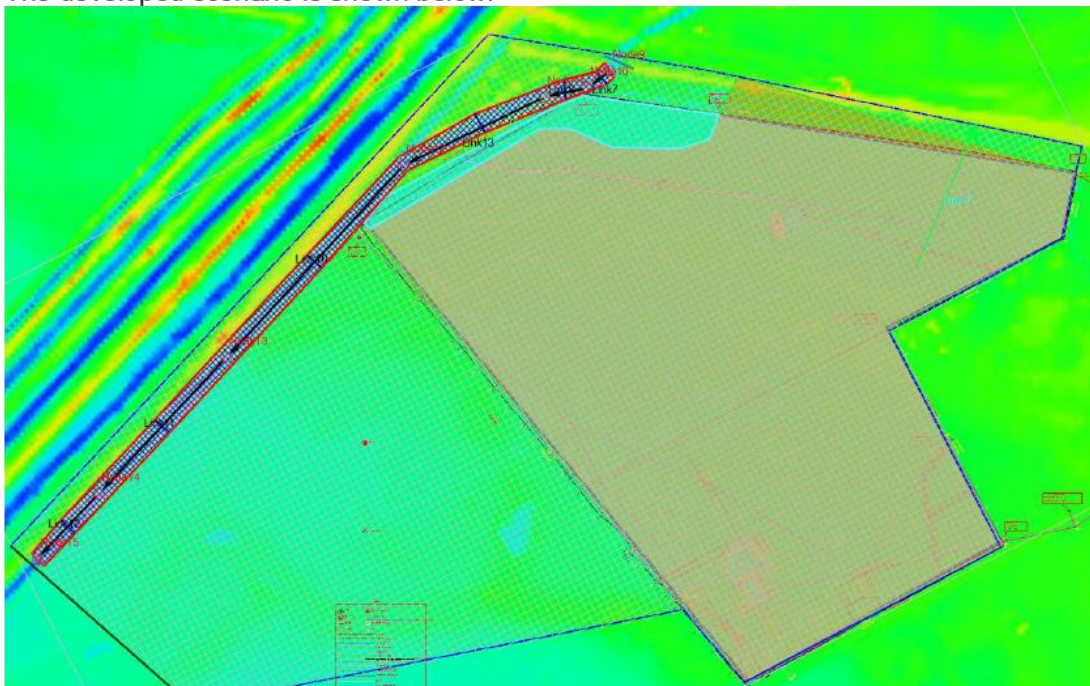


Figure 19: Developed 2D model

Applying the same flood flows to the model results in a new flood map for the site and surrounds as shown overleaf.



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

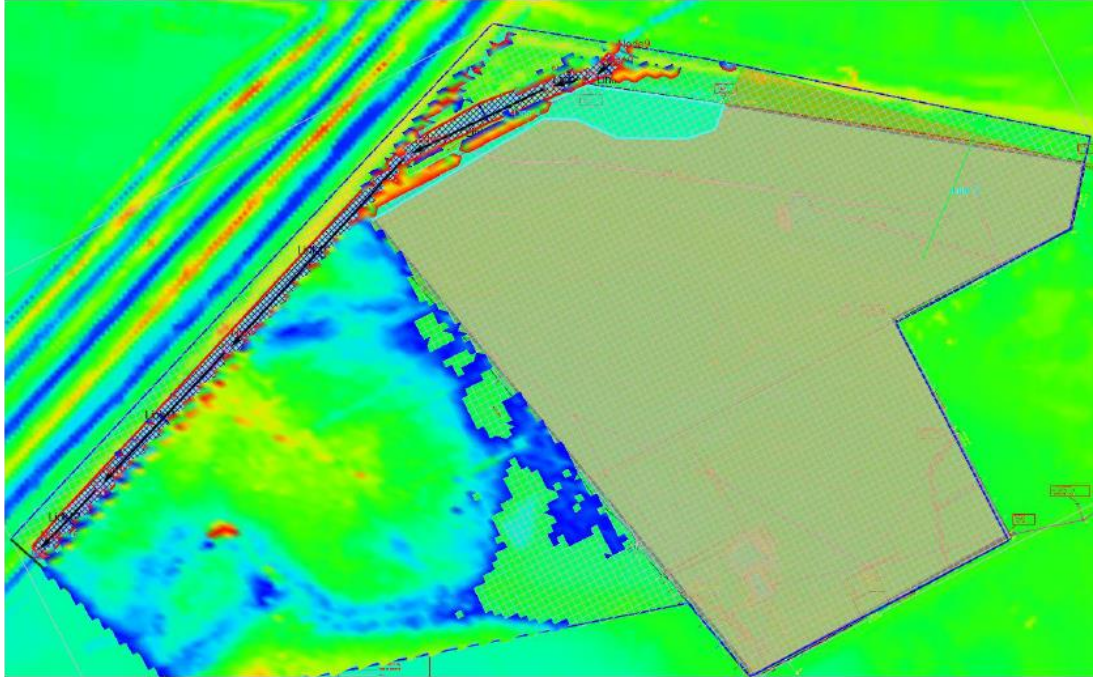


Figure 20: Developed 2D model results

Flood levels at the upstream end of the site indicate that the proposed filling and shaping do not impact on flood levels from the existing case:

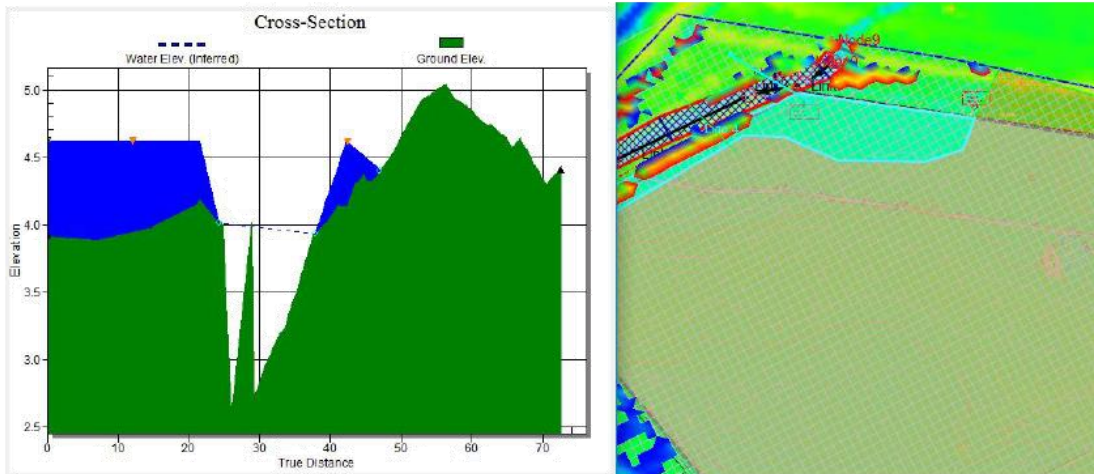


Figure 21: Developed 2D model Cross Section with filling and shaping



Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

The gap of “blue water” in the cross section occurs as the channel is modelled in 1D and is not graphed in the output. However, the flows are accounted for.

Figure 21 shows that a flood level of 4.6m AHD is maintained for the developed site.

At the downstream end of the site, flood levels in adjacent property is also maintained to match existing conditions.

Filling for the model was arbitrarily filled to RL 5.0 with a graded fill level being required in detailed design from RL 5.2 to 4.5m AHD to comply with 600mm fill requirements.

As shown in Figure 19, the shaping of the development is required to provide additional flow path for overland flows to the east of the Southern Boundary Drain.

In our estimation, the Southern Boundary Drain only has capacity for approximately 32m<sup>3</sup>/s and the additional 8m<sup>3</sup>/s spills to the east.

## 5 Water Quality Treatment

To verify the size of the treatment train approach, MUSIC V6 is used to model runoff from real storms over a period of time and routing these through treatment nodes.

As stated earlier, the objectives are to meet the following water quality targets:

- ✓ Suspended Solids - 80% retention of typical urban annual load;
- ✓ Total Nitrogen - 45% retention of typical urban annual load;
- ✓ Total Phosphorus - 45% retention of typical urban annual load; and
- ✓ Litter - 70% reduction of typical urban annual load.

To achieve the targets, it is proposed to install a sediment basin and wetland system within the base of the retarding basin modelled earlier.

### 5.1 Model Setup

The water quality model for the site requires rainfall patterns for the area and an iterative sizing of sediment basin and wetland area to achieve best practice.

### 5.2 Rainfall Data

As per Melbourne Water Guidelines, the appropriate reference file is the Koo Wee Rup 2004 rainfall record. The rain evaporation pattern for the catchment is shown below:



Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

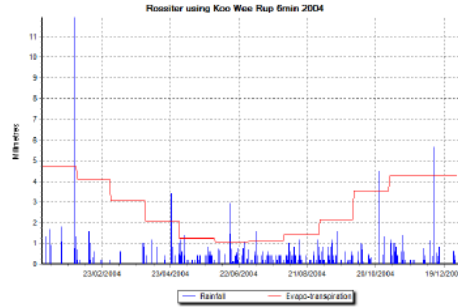


Figure 22: Rainfall and evaporation pattern

Total yearly rainfall for the data set is 797mm per annum and evaporation of 1,011mm occurs.

	Rainfall/6 Minutes	Evapo-Transpiration
mean	0.009	2.763
median	0.000	3.060
maximum	11.900	4.710
minimum	0.000	1.070
10 percentile	0.000	1.160
90 percentile	0.000	4.290
mean annual	Rainfall: 797	Evapo-Transpiration: 1011

Figure 23: Rainfall and Evaporation Summary

### 5.3 MUSIC Layout

Based on meeting the treatment configuration as follows:





Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>



Figure 24: Treatment Train Model

As shown above, all flow is directed to the sediment basin and then wetland located in a retardation basin.

#### 5.4 MUSIC Results

Based on meeting the above water quality objectives, sizing of the elements to meet Best Practice was achieved.





Biofilta Pty Ltd  
 Unit 2 – 49 Bertie Street  
 Port Melbourne  
 VICTORIA 3207  
 Web Site: <http://biofilta.com.au>

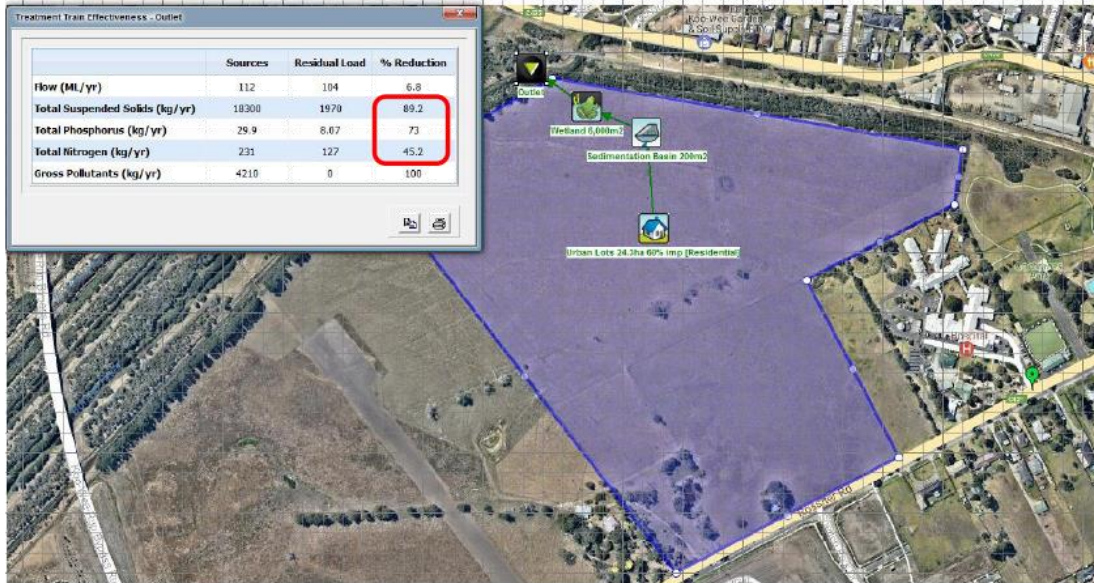


Figure 25: Best Practice Outcomes

The treatment train result for this configuration shows that Best Practice targets are met with the following key elements:

1. 200m2 Sediment basin
2. 6,000m2 wetland with 0.5m extended detention

For the catchment size of 24.3ha, the treatment size ( 6,200m2 ) represents 2.55% of the catchment area which is comparable to the first pass industry guideline for wetland sizing requiring 3% of the catchment area to achieve Best Practice.

It is noted that the requirement for the wetland and the requirement for the retardation are mutually exclusive and if a wetland is adopted as the ultimate treatment approach, the sizing of the reserve will be dictated by the treatment element, not the retardation.

Smaller footprint stormwater treatment outcomes can be achieved with a Biofilta Treatment system, however that is outside the scope of this report and the client will reserve its right to further investigate this option at a later stage.

## 6 Recommendations



Biofilta Pty Ltd  
Unit 2 – 49 Bertie Street  
Port Melbourne  
VICTORIA 3207  
Web Site: <http://biofilta.com.au>

After consideration of the stormwater management options at the subject site and through consultation with Melbourne Water, we believe that the initiatives presented in this report meet and exceed the stated Stormwater Management Objectives in the areas of:

- ✓ Detention
- ✓ Water Quality
- ✓ Flood management

Biofilta recommends that Council support the rezoning development proposal on the basis that the development meets all Stormwater Management Objectives and demonstrates benchmark environmental performance with no detrimental effects to surrounding properties in the peak flood event.

--/20--  
-  
**SCHEDULE 22 TO CLAUSE 43.04 DEVELOPMENT PLAN OVERLAY**

Shown on the planning scheme map as **DPO22**.

**145 ROSSITER ROAD KOO WEE RUP (PART) – LOT 2, PS 321029**

**1.0 Objectives**

- /20--  
-
- To integrate with the surrounding area by responding to existing neighbourhood character, enhancing the public realm and existing networks.
  - To provide landscaping, open space, recreation and pedestrian/bicycle path facilities that is well connected, sustainable and meets the needs of the local residents.
  - To create a subdivision layout and residential dwellings that protects Koo Wee Rup's environmental amenity.

**2.0 Requirement before a permit is granted**

--/20--  
-

A permit may be granted to use or subdivide land, construct a building or construct or carry out works before a development plan has been prepared to the satisfaction of the responsible authority if the responsible authority is satisfied that the permit will not prejudice the future integrated use and development of the land.

**3.0 Conditions and requirements for permits**

--/20--  
-

The following conditions and/or requirements apply to permits :

- Construction of the internal road network to the satisfaction of the responsible authority during the first stage of development, extending from Rossiter Road through Lot 2, PS32129 – 145 Rossiter Road, Koo Wee Rup which is generally in accordance with the Site Development Plan labelled Diagram 1.

**4.0 Requirements for development plan**

--/20--  
-

A development plan must include the following requirements:

**Subdivision Layout**

- An indicative lot layout showing how the subdivision addresses the size, dimension and orientation of lots and includes:
  - The provision of a range of lot sizes.
  - The provision of 80 percent of the lots greater than 700 square metres.
  - The avoidance of smaller lots of less than 600 square metres.
  - Lots to have a minimum width of 18 metres.
  - A transition to the green wedge land to the western property boundary through larger lots of greater than 1000 square metres.
- A landscape buffer of a minimum 10 metres wide along the western boundary abutting Green Wedge land, a landscape buffer of a minimum 12 metres along the Rossiter Road boundary and a landscape buffer of a minimum 20 metres along the northern boundary and subdivision interface with the constructed wetlands.
- A perimeter road adjacent to the landscape buffers along the western boundary, northern boundary, constructed wetlands and part of the eastern boundary adjoining the Public Park and Recreation Zone.
- A service road internal to the site north of Rossiter Road and the associated landscape buffer to provide vehicular access to lots addressing Rossiter Road.

- A legible and convenient road network and pedestrian/bicycle network demonstrating appropriate road layout, traffic management and construction standards.
- An indicative building envelope for each lot providing:
  - A minimum front setback of 7 metres.
  - Minimum side setbacks of 2.5 metres.
- Incorporate the driveway and boundary of the heritage overlay for 'Shepton Mallet'.
- Subdivision layout to be designed to overlook public spaces.
- Be generally in accordance with the Site Development Plan at Diagram 1 of this Schedule.

### Staging

- Details on the staging of the subdivision and anticipated timing of development.
- Open space to be delivered as part of the first stage.
- Construction of the internal road network to be delivered as part of the first stage of development, extending from Rossiter Road through Lot 2, PS32129 – 145 Rossiter Road, Koo Wee Rup, generally in accordance with the Site Development Plan - Diagram 1.

### Open Space

- The provision of open space required for drainage by Melbourne Water to be provided in addition to the unencumbered public open space.
- Multiple unencumbered local neighbourhood parks with minimum areas of 4000 square metres located generally in accordance with the Site Development Plan in Diagram 1 to this Schedule.
- Shared paths throughout the development to link the land to existing development to the north and east and to Rossiter Road.
- Provision of a 3 metre shared pathway along the 12 metre wide tree reserve adjoining Rossiter Road that leads to Koo Wee Rup Town Centre.
- Provision of a shared pathway that connects with the Koo Wee Rup Rail Trail and Cochranes Park on the north-eastern boundary of the site.
- Open space to be designed to adjoin a road reserve, other open space areas or public use zone along all boundaries and must avoid any side or rear fences of residential lots abutting reserves.

### Environment and Landcaping

- A **Bushfire Management Assessment** and **Bushfire Management Statement** prepared by a suitably qualified professional including:
  - Details of how the development plan and lot layout responds to the bushfire planning policy in the planning policy framework and results in development that achieves no more than a BAL 12.5 rating under AS 3959-2009.
- An **Environment Site Assessment** prepared by a suitably qualified professional, indicating the land is suitable for the proposed use, and whether an environmental audit of the land is required in accordance with Part IXD of the *Environment Protection Authority Act 1970*.
- A **Environmental Management Plan** that addresses vegetation and trees to be retained and how vegetation removal on site will be avoided, and if it cannot be avoided, minimised or offset, including roadside vegetation, measures to protect the trees which includes buffer and tree protection zones, and provides:
  - A **flora and fauna assessment** (including a habitat hectare assessment) of the site prepared to the satisfaction of the responsible authority.

- A targeted survey and plan for the Southern Brown Bandicoot and Growling Grass Frog by a suitable qualified environmental consultant during the summer period in consultation with the Department of Sustainability and Environment and the Department of Environment, Land, Water and Planning.
- A **Landscape Plan** that protects remnant vegetation, wetlands and manages the Southern Brown Bandicoot and Growling Grass Frog habitats, and includes:
  - A plan showing measures to implement Southern Brown Bandicoot and Growling Grass Frog protection including landscaping.
  - Ensure the protection and conservation of existing vegetation including street trees, landscaped buffers, roadside vegetation and grassed road verges.
  - New plantings should be consistent with existing species of vegetation from connecting roads and reserves.
  - Ensure the majority inclusion of native vegetation in new developments in all landscape plantings.
  - Ensure the inclusion of street trees for shade and aesthetic quality in new developments at an early stage of development.
- A **Construction Management Plan** prepared by a suitably qualified professional that identifies methods to protect open space, remnant vegetation and aboriginal cultural heritage sites during construction.

### Traffic and Transport

- An **Integrated Transport and Impact Assessment** prepared to determine the extent of mitigation works required for the development site and Rossiter Road to the satisfaction of the Responsible Authority and the relevant transport authority.
- A **Traffic Impact and Design Assessment**, showing arrangements for vehicle ingress and egress to the development, including the road layout, construction standards, traffic management, traffic volumes and design vehicle swept paths which includes waste and emergency vehicle access prepared to the satisfaction of the Responsible Authority and in consultation with the Roads Corporation.
- Design of local roads generally in accordance with the Site Development Plan labelled Diagram 1 and provides:
  - A minimum width for paved surfaces of for internal streets or carriageway of 7.3 metres to allow for parking on either side and access for emergency vehicles.
  - A minimum width of 16 metres for road reserves or 14 metres for roads adjoining open space reserves.
  - A design that excludes the use of cul-de-sacs.
  - Traffic Management devices required for roads over 180 metres in length.
  - A road network that provides for loading and unloading of vehicles and means of access to them including waste and emergency vehicles.
  - A road network that provides a predominantly north-south and east-west road connections to assist with water fall and stormwater catchment to the north and west of the subject site.
  - A boulevard entry to the site from Rossiter Road.
- A clear, legible road network which provide a high level of internal connectivity and external linkages for local vehicle, pedestrian and bicycle movements.

### Infrastructure and Drainage

- A **Stormwater Management Plan** prepared in consultation with the relevant water authority that includes a hydrogeological assessment, water sensitive urban design principles and a drainage and servicing assessment addressing all relevant drainage, flooding and water quality issues, and includes:



- A **Fill Plan** which identifies the depth and fill material, and staging in a manner and in a time designed to minimise any adverse impact on the amenity of nearby areas, and the treatment and mitigation of the created level differences with the adjacent land on the western boundary.
- An **Acoustic Report** prepared by a suitably qualified professional, indicating any impacts of the Koo Wee Rup Bypass on future residential land and includes methods to address the amenity issues identified.
- Provision of utility service infrastructure required to service the development and details on the arrangements for the provision of infrastructure underground.
- Provision of a reticulated sewerage system.
- Provision and location of the gas transmission easement and drainage easement will be accommodated as part of the development.

#### **Urban Design and Character**

- Configure dwellings to maximize retention of existing vegetation and allow only one access driveway to a lot.
- Maintain a sense of spaciousness between dwellings of the residential areas.
- Avoid front fences, if lots are fenced in front of the building line provide low front fences no more than 1.2 metres high. Respect and be sympathetic to the existing streetscape character found in Koo Wee Rup Township.
- A high level of quality in the design and construction of new buildings which responds to the existing built form character of the Koo Wee Rup Township.
- Dwelling design should be sympathetic to the adjoining heritage property 'Shelton Mallet' and its associated vegetation.
- Dwellings located along Rossiter Road should provide active frontages to Rossiter Road.
- Provide generous street, footpath and easement widths in new developments.

Site Development Plan – Diagram 1

