

WINCHELSEA INTEGRATED WATER MANAGEMENT PLAN



September
2019

IWM Plan

FINAL

*A collaborative project between Surf Coast Shire, Barwon Water and
the Department of Environment, Land Water and Planning*



Environment,
Land, Water
and Planning

WINCHELSEA INTEGRATED WATER MANAGEMENT PLAN

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Acknowledgement

This IWM Plan was identified as a priority by the Barwon IWM Forum and is a collaborative project between Surf Coast Shire Council, Department of Land Water and Environment and Barwon Water.

The partners acknowledge that the Plan covers both Wadawurrung (Wathaurung) Country and Eastern Maar Country and whose ancestors and their descendants are the traditional custodians of this land. The partners pay their respects to Elders past and present and recognise the intrinsic connection of Traditional Owners to Country and acknowledge their ongoing contribution to the management of land, water and resources.

The partners further acknowledge the need for a comprehensive process of engagement with Wadawurrung and Eastern Marr on potential future partnership actions as the portfolios detailed within this IWMP proceed to implementation stage.

Prepared by:



resilientUrban

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Executive Summary

The town of Winchelsea, set on the banks of the Barwon River in the Surf Coast Shire is an important hub for the surrounding agricultural area with a vibrant community and country living lifestyle. The town's population of 2,000 people is set to expand as one of the region's growth nodes. The town retains a village atmosphere and is a popular stopover destination for travelers, enjoying with the iconic river red gum scenery along the river.

The community of Winchelsea has a strong connection to water in the urban landscape, through the river, open spaces and the grassed swales that exist in many of the wide streetscapes. The town is already facing various water-related issues including urban expansion which will increase demand of water, sewerage and stormwater networks, several inactive public open spaces which are not well utilised due to a lack of irrigation, a water reclamation plant that is nearing capacity, direct stormwater discharges to the river, wide bare streetscapes offering limited shade and a poorly linked pathway network using the river as the central spine.

The impacts of many of these issues are likely to be exacerbated with the combined effects of population growth and climate change. With significant growth already occurring, many initiatives are underway in the town which may have a water-related dimension. There are also likely to be new water-related challenges and opportunities on the horizon.

This Integrated Water Management Plan is designed to bring all these issues together in a way that identifies potential opportunities for collaborative cross agency support. The plan has been prepared by the Surf Coast Shire in partnership with the Department of Land, Water, Environment and Planning and Barwon Water. The Plan applies the objectives of the Barwon Region Integrated Water Management Forum to the township through the towns vision outlined in Growing Winchelsea Plan. It identifies potential opportunities (not commitments) that could explore how water-related solutions can be collaboratively implemented to achieve the town's broader vision.

The method adopted to develop the Winchelsea IWM Plan is based on four broad phases designed to facilitate this integrated approach:

1. Create a shared understanding of the issues and goals based on a water-cycle-systems model;
2. Identify preferred approaches to achieve multiple benefits;
3. Co-design integrated, place-based solutions;
4. Secure support for collaborative implementation and ongoing management.

The Winchelsea IWM Plan encompasses Phases 1, 2 and 3 of this process and involved a series of stakeholder workshops and feedback on staged reports. The output is this Plan, which presents a suite of potential IWM opportunities which address key system issues and therefore will help contribute to Winchelsea's community vision.

Through a series of workshops and direct feedback, stakeholders identified a range of water related problems and challenges, focusing in on those which have, or could have significant impact on the broader community aspirations of the town if left unaddressed; and/or require a high degree of integration and collaboration across stakeholders to resolve. The process highlighted seven broad themes that are considered to be critical to a more liveable, productive and sustainable Winchelsea:

- Adopting a coordinated approach to enhancing the Barwon River and its role as the central spine for active travel in the town, including combining accessibility and stormwater improvements at several key access nodes;
- Investigating the potential to enhance the town's recycled water scheme to help irrigate public open spaces in the township;
- Cooling the wide streetscapes through tree and landscape enhancement;
- Investigating the potential to enhance stormwater management at the Golf Course;
- Reinvigorating and activating the economic and social values of Barwon Park Mansion and surrounds through better access to water, including recycled water; and
- Establishing better processes to encourage adoption of IWM in new developments (including wider, greener streets and enhanced connectivity);

For the issues within these themes, preferred options were identified and subsequently developed as potential IWM opportunities. Shortlisted opportunities were then combined into IWM 'portfolios', to provide integrated, place-based solutions offering multiple benefits, or synergies. They are also designed to stimulate interest in water's role in the town's future and act as catalysts for commitment to collaborative actions.

Five IWM Portfolios have been identified, consistent with the themes outlined in Growing Winchelsea.

ENHANCING THE BARWON RIVER

This portfolio brings together all existing, planned and potential opportunities related to enhancing the Barwon River through Winchelsea. It recognises the importance of the river to the town's sustainability, prosperity and liveability and seeks to ensure a coordinated, strategic approach to improving river health, amenity and accessibility over the long term. Enhancing Winchelsea's reputation as a preferred first stop from Melbourne for travelers, encouraging them to take a break drive safely and appreciate the amenity of this iconic river scenery.

COOLER, COUNTRY STREETSCAPES

This group of opportunities addresses the key issue of hotter and drier streets across the township, a real threat which is likely to be exacerbated by climate change. It involves establishing a 'cooler streetscape' trial, where a combination of measures would be installed to address the underlying causes of a warmer streetscape. These include retaining grass swales and planting site-suitable canopy cover trees on the road side-slope of these swales. The trees would benefit from passive watering from the road, enabled by a roadside curb and channel punctuated by cut-aways to allow for water inflows during storm events. House downpipes would also be directed to the swales. Property access would be via concrete cross overs to avoid flow related issues associated with culverts.

SMART STORMWATER, GREENER GOLF

The Winchelsea Golf Course is a key open space asset in the town which is a major user of recycled water and also uses locally captured stormwater when available. Stormwater management has exacerbated existing problems from excess water and flooding, impacting on the access and the quality of the fairways. This concept proposes a cost-effective WSUD based solution to intercept most of the floodwater that currently spills out across the course, whilst providing an opportunity to harvest and treat the water, improving security and enhancing the biodiversity and amenity of the area. Complimentary works would improve the ecological and hydrological functionality of the existing drain along Dwyer Street, with a new adjoining walking path along the creek linking the new development with the proposed Barwon River Trail.

RECYCLED WATER FOR GREENER, HEALTHY SPACES

This portfolio recognises the value of water for a greener, healthier and more vibrant Winchelsea, proposing the enhancement of the town's recycled water scheme to service key open spaces across the township. Stage 1 involves upgrading the plant and taking the water to Hesse Street Reserve, Lions and CWA Parks and the western gateway. Stage 2 would include the potential Winchelsea Arboretum (along the trail around the WRP), the Eastern gateway and the river surrounds in the high use zone on the east bank, with Stage 3 to service the new oval at Eastern Reserve and Barwon Park Mansion

GREENING, GROWING BARWON PARK

This portfolio presents an innovative proposal to rejuvenate the famous Barwon Park state heritage listed property on the northern outskirts of the town through use of recycled water from the nearby treatment plant. The water would be used extensively in the mansion's surrounds, gardens and landscaping, improving potable water security, firefighting ability and the overall visitor experience. New pathway links back to the township, along the river corridor and the potential Winchelsea Arboretum would help make Winchelsea a 'stay and play' destination. A purpose-built Mansion Circuit Walk, heritage apple orchard and a retail cidery and café in the historic stables would help enhance the visitor experience and provide local employment.

In addition to these portfolios of IWM opportunities, three site-based IWM Concept Plans are presented for Lions Park, Armytage Street river access and Hesse St river access. These sites are important public access nodes to the Barwon River and also present water related challenges, mainly stormwater management. Given Council is also conducting or planning to undertake site-based works to improve the access and amenity at these sites and integrated solution offers multiple benefits.

The fourth phase of the process involves presenting the IWM Plan to the broader community, to test and refine the ideas and concepts such that a Final Plan can be developed and endorsed. The ultimate stage in this phase involves stakeholders and community agreeing on those IWM opportunities which should be implemented through collaborative processes and shared commitment.

Introduction

Winchelsea in the Surf Coast Shire has a vision to be a welcoming and thriving township with a rich cultural heritage and country feel (Growing Winchelsea Strategy, 2015).

While there are many factors that will contribute to achieving this vision, the Winchelsea Integrated Water Management (IWM) Plan focuses on the role that water and the water system can play in creating a more liveable, productive and sustainable Winchelsea.

The scope of the water cycle system for Winchelsea is itself complex and interconnected. It encompasses drinking water and wastewater, the river, its tributaries and floodplains, drainage infrastructure such as swales, stormwater pipes and pits, public open spaces and blue-green corridors as well as the use of alternative water sources for irrigating those spaces. These are all important aspects which could help shape the town's future, particularly given external pressures from climate change and population growth.

There is a growing awareness in Victoria of the critical need for integrated, rather than fragmented management of this complex urban water system. The IWM Plan for Winchelsea is an example of this integrated approach and has been prepared by the Surf Coast Shire in partnership with the Department of Land, Water, Environment and Planning and Barwon Water.

The method adopted to develop the Plan is based on three broad phases designed to facilitate this integrated approach through a series of workshops with key stakeholders and direct feedback

1. Create a shared understanding of the issues and goals based on systems thinking;
2. Identify preferred approaches to achieve multiple benefits;
3. Co-design integrated, place-based solutions.

The output is this IWM Plan, which presents a suite of potential IWM opportunities which address key system issues and therefore will help contribute to Winchelsea's community vision. Where appropriate, these opportunities have been grouped together in 'portfolios' which are presented graphically in order to encourage further discussion and insight from a broader audience. The IWM Plan includes:

- **Background** to introduce the concept of IWM, its relevance to Winchelsea, the key players involved and the planning process;
- **Strategic context** which identifies the key trends and drivers affecting the township, the broader community aspirations for the town and the potential ways in which IWM can support that vision;
- **Key IWM issues and options** identifies the key water-related issues in the town and the options considered to address those issues, plus commentary on their acceptability or otherwise
- **IWM opportunities** presents the priority IWM opportunities for further consideration, grouped together as Portfolios and Concept Plans that offer integrated solutions to many related water-related issues.

Note that the fourth phase of the IWM planning process involves securing support for collaborative implementation and ongoing management. This has included the Surf Coast Shire and its partners presenting this Draft IWM Plan to the broader community, to test and refine the ideas and concepts such that a Final Plan can be developed and endorsed.

The ultimate step in this phase involves stakeholders and community agreeing on those IWM Opportunities which should be implemented through collaborative processes and shared commitment.

Background

The township of Winchelsea

Winchelsea, is in the hinterland of the Surf Coast Shire in southern Victoria, 40km west of Geelong. Set on the banks of the Barwon River, it is an important hub for the surrounding agricultural area. With a vibrant community and country living lifestyle, the town's population of 2,000 people is set to expand over coming decades at a growth rate of about 2.2% as one of the G21 region's designated growth nodes (Surf Coast Shire, 2015).

The town retains a unique country village atmosphere and is a popular stopover for travelers returning from the Surf Coast and Great Ocean Road touring destinations via the Princes Highway. The town is well serviced with health, hospital and care facilities, primary schools and kindergartens, senior citizens facilities, various sporting amenities and extensive public open spaces.



Celebrating the Barwon River



Authentic country village lifestyle



Rich cultural heritage



Activities for old and young

What is Integrated Water Management?

When we think about water management in our cities and towns, we often focus on our drinking water supplies, sewerage and stormwater. Of course, these are important aspects of urban water management, but there are other ways the water system contributes to the sustainability and liveability of our cities and towns, including:

- **Flooding and drainage (as well as stormwater)** – effective design and management of flood and drainage assets and networks (such as swales, stormwater network and floodplains) helps to protect community safety and reduce damage to property, but it also helps to retain water in the urban landscape, which has a cooling and greening effect. Treating stormwater before it enters the rivers and streams helps protect water quality for biodiversity, such as platypus and fish;
- **Waterways** - enhancing the condition and value of natural water assets like rivers, creeks and wetlands provides townships with local, special places where they can connect with others and with nature, be active and healthy and become aware of the cultural values of water;
- **Water in greener, connected urban landscapes** – many of the important public open spaces and pedestrian/cycling corridors we have in our cities and towns are co-located with water assets such as creeks or rivers. By irrigating these open spaces and enhancing these ‘blue-green links’ communities can have healthy places and spaces to recreate, enjoy and connect;
- **Community and economic values of water** – there is growing understanding of the importance of water to our sense of wellbeing, our culture and our connectedness, as well its role as a catalyst for innovations which help towns prosper and thrive.

These different urban water management issues are complex and interconnected, but historically they have been managed separately and in a fragmented manner. There are many different players involved, including the Water Utility, Local Government, Catchment Management Authority, Traditional Owners, Government Departments and of course residents and businesses.

Over the years this fragmented, ad hoc approach to urban water management has contributed to confusion and sometimes conflicts. But most importantly it has resulted in missed opportunities for innovative water-related solutions that could have made a more positive contribution to more liveable and resilient urban landscapes.

Integrated Water Management (IWM) is a different approach to managing these complex and interrelated issues. It encourages greater collaboration across these jurisdictions to develop shared understanding of the issues, common visions and goals and co-design of practical opportunities that could deliver multiple benefits, for the community, environment and the economy.

To drive this collaborative approach in Winchelsea and avoid missing future opportunities, the Surf Coast Shire has partnered with Department of Environment, Land Water and Planning (DELWP) and Barwon Water to developed this Integrated Water Management (IWM) Plan for the town.

Defining IWM

The Barwon IWM Forum defines IWM as:

‘Integrated, collaborative management of the water cycle (system) that enables sustainable environmental, social, cultural and community prosperity for the Barwon Region’

(Barwon IWM Forum Strategic Directions Statement, DELWP, 2018).

Why an IWM Plan for Winchelsea?

The community of Winchelsea has a strong connection to its urban water cycle system, particularly given the Barwon River is one of its greatest natural assets. Water is also highly visible in the landscape (when it rains) because of the predominantly surface-based drainage and stormwater system. The town is already facing various water-related issues including;

- increasing demand for drinking water for potable uses and a growing demand for affordable alternative sources for non-potable uses such as irrigation of public open space;
- a water reclamation plant that is nearing capacity and will require an upgrade to ensure it continues to meet environmental and public health standards;
- localised nuisance flooding from street drainage
- direct stormwater discharges to the river, which experiences low flows during summer
- Wide bare streetscapes which offer limited shade and harsh, reflective surfaces that's makes them much hotter than adjoining parklands and exacerbates what is known as the urban heat island effect;
- Areas of largely inactive public open spaces which are not well utilised due to a lack of irrigation for turf and surrounding landscaping;
- Urban expansion which will increase demand of water, sewerage and stormwater networks, as well as quality and accessible public open spaces

The impacts of these water-related issues are likely to be exacerbated with the combined effects of population growth and climate change. With significant growth already occurring, many initiatives are underway in the town which may have a water-related dimension. There are also likely to be new water-related challenges and opportunities on the horizon.

This IWM Plan helps bring all these issues together in a way that identifies opportunities for cross agency and multi-stakeholder solutions. Integrated water management is therefore not one single solution, rather it is a way of discovering many different solutions to different but often interlinked issues. There are many examples of 'IWM solutions' as illustrated in Figure 2, overleaf.



FIGURE 1 WINCHELSEA IS IN A GROWTH PHASE

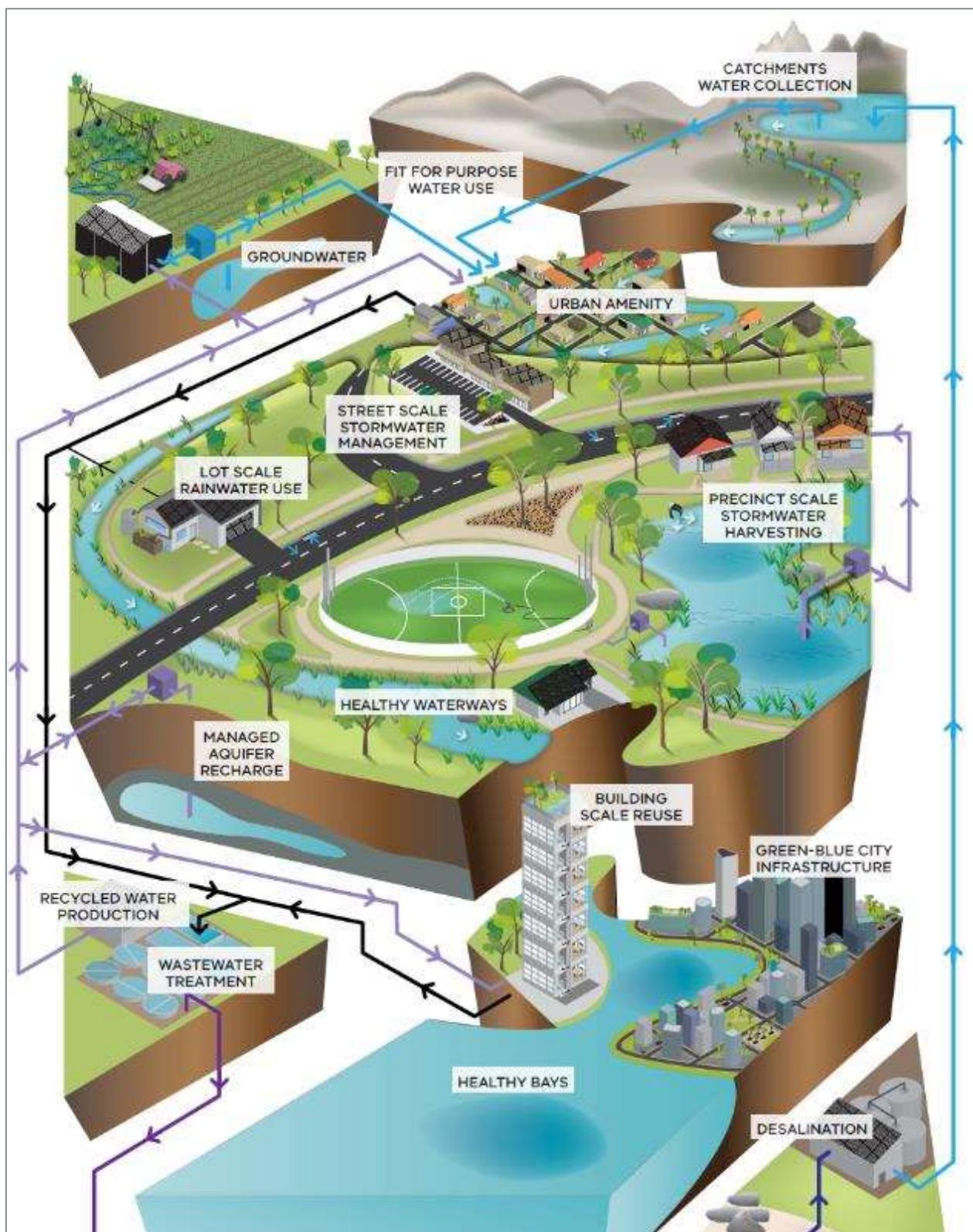


FIGURE 2 EXAMPLES OF POTENTIAL IWM SOLUTIONS (DELWP, 2017)

Who is involved in IWM?

For a town like Winchelsea, there are many stakeholders involved in urban water management. The roles they play and the decisions they make can have direct and indirect impacts on the water system, so the IWM Plan is a chance to bring all these decision makers together.

- **Surf Coast Shire** is responsible for the planning and operation of drainage infrastructure and urban stormwater management, and applying IWM in planning for new and infill urban development, open space, roads and streetscapes, as well as having operational management of these areas. Council is also a large user of water and engages and represents the local community aspirations.
- **Barwon Water** is regional water utility responsible for delivering effective, safe and efficient drinking water, sewerage and recycled water services to Winchelsea;
- **Corangamite Catchment Management Authority** is the steward for waterway health and has statutory roles for floodplain management and works on waterways;
- **Traditional owners, Wadawurrung and Eastern Marr**, are recognised as having cultural, spiritual, and economic connections to land, water, and resources through their cultural heritage and relationship with Country around Winchelsea;
- **Southern Rural Water** manages bulk allocation of water in southern Victoria, including extractions from surface and groundwater systems and licensing of farm dam construction and bores;
- **Urban developers** play an important role in applying IWM policy in practice through the design and planning of new urban developments, residential and/or industrial;
- **Community interest groups** such as Growing Winchelsea Inc. provide voice-of-community feedback on options and solutions and are often involved on the ground implementing actions;
- **Property owners** and businesses are both users of water and wastewater services as well as contribute to maintaining the form of the urban streetscape;
- **Department of Environment, Land Water and Planning (DELWP)** is designated owner of Crown Land which it outsources to Committees of Management (e.g. Shire and Winchelsea Golf Club) and leads statewide IWM policy and facilitates the Regional IWM Forums.

Water Cycle Aspect	Sub aspects	SCS	BW	TOs	CMA	SRW	Dev.	Land owners	Int. Groups
Water Sources	Drinking water service		✓				✓		
	Bulk water					✓			
	Stormwater reuse	✓			✓		✓		
	Recycled water		✓						
	Rainwater						✓	✓	
Wastewater	Sewerage		✓				✓	✓	
	On site systems	✓							
Flooding, drainage and stormwater	Floodplain planning				✓				
	Nuisance flooding	✓					✓		
	Major drainage	✓					✓		
	Stormwater	✓					✓		
Waterways	Waterway health			✓	✓				
	Riparian zones	✓		✓	✓				
Urban landscapes	Public Open Space	✓					✓		
	Streetscapes	✓					✓	✓	
	Active travel paths	✓		✓	✓		✓		
Social values of water	Aboriginal values			✓				✓	
	Community involvement	✓		✓				✓	✓

TABLE 1 LEAD ROLES IN IWM FOR WINCHELSEA

Winchelsea IWM Plan

Project aims

The aims of this project were to:

1. Engage stakeholders in an IWM Planning process that creates shared understanding of the key water system related problems and issues and develops agreed IWM goals to help the town achieve its broader community aspirations;
2. Identify opportunities for the water cycle system to make a positive contribution to the towns and develop a practical roadmap for collaborative implementation over time;
3. Enhance the internal capacity of Council to apply IWM in practice across the shire.

Project scope

The Winchelsea IWM Plan focuses on the area within the Winchelsea Structure Plan but includes the interactions and linkages with the broader catchment beyond this area (Figure 3).

There are often different interpretations of what is included in a system-based approach to urban water management. This Plan covers the following aspects of the urban water cycle system:

- Natural water aspects such as waterways, floodplains and wetlands;
- Urban landscape aspects including land use and public open space amenity and streetscapes
- Constructed water management aspects including major drainage and stormwater infrastructure (including Water Sensitive Urban Design);
- Consumptive water sources including drinking water and alternatives (rain, stormwater, recycled water)
- Sewerage services

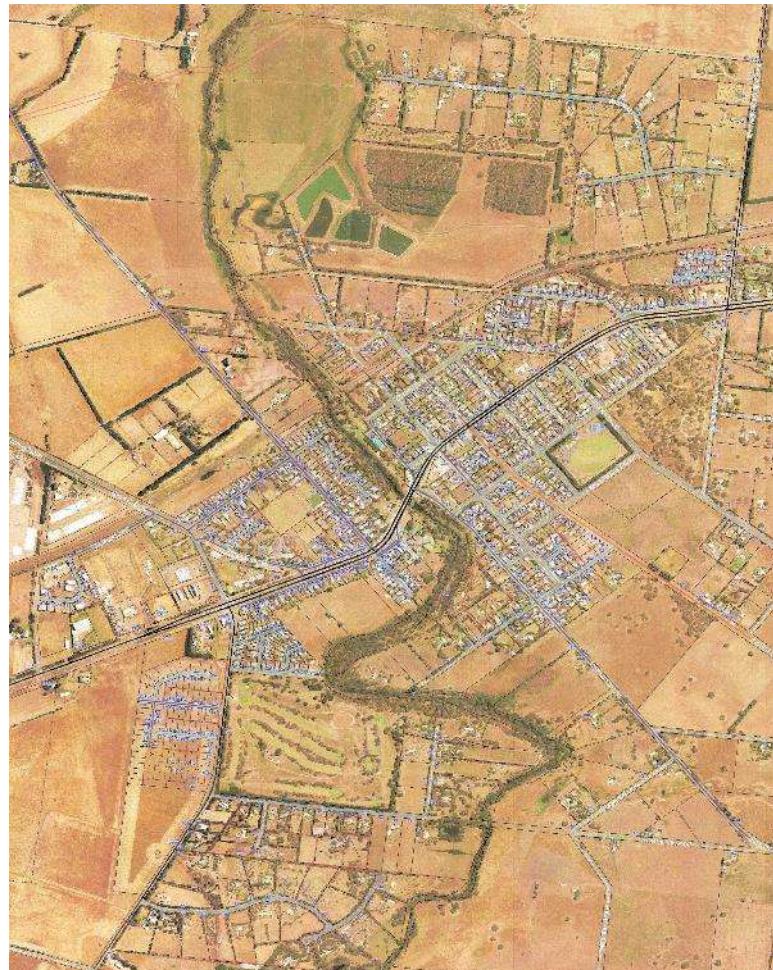


FIGURE 3 WINCHELSEA IWM PLAN STUDY AREA (URBAN AREA ONLY, APPROXIMATE)

Developing the Plan

There is a growing awareness in Victoria of the critical need for integrated, rather than fragmented urban water management. The method adopted to develop the Winchelsea IWM Plan is based on four broad phases designed to facilitate this integrated approach:

- Create a shared understanding of the issues and goals based on systems thinking;
- Identify preferred approaches to achieve multiple benefits;
- Co-design integrated, place-based solutions;
- Secure support for collaborative implementation and ongoing management.

The Winchelsea IWM Plan covers encompasses Phases 1, 2 and 3 of this process and involved a series of stakeholder workshops and feedback on staged reports (Figure 4).

The output is this Plan, which presents a suite of potential IWM opportunities which address key system issues and therefore will help contribute to Winchelsea's community vision. Where appropriate, these opportunities have been grouped together in 'portfolios' which are presented graphically in order to encourage further discussion and insight from a broader audience.

The fourth phase of the process involved presenting the Draft IWM Plan to the broader community, to test and refine the ideas and concepts such that a Final Plan could be developed and endorsed. The ultimate stage in this phase involves stakeholders and community agreeing on those IWM opportunities which should be implemented through collaborative processes and shared commitment.

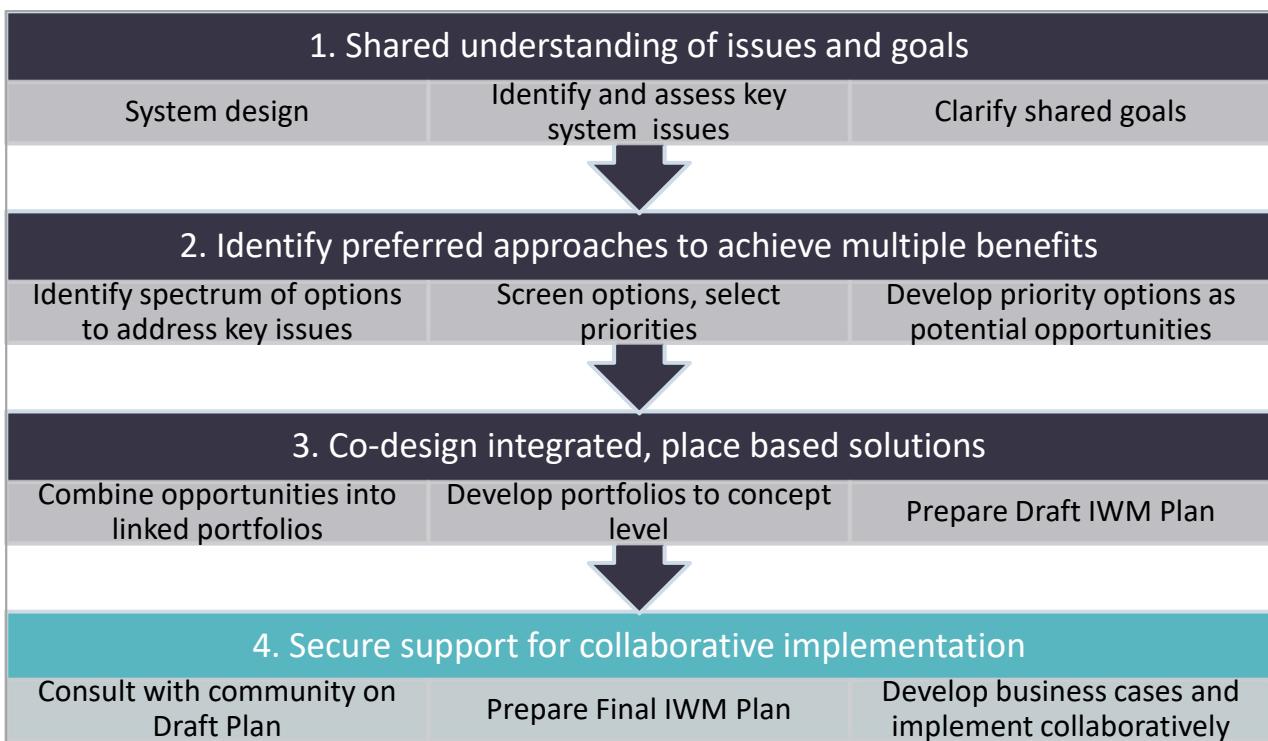


FIGURE 4 DEVELOPING THE WINCHELSEA IWM PLAN

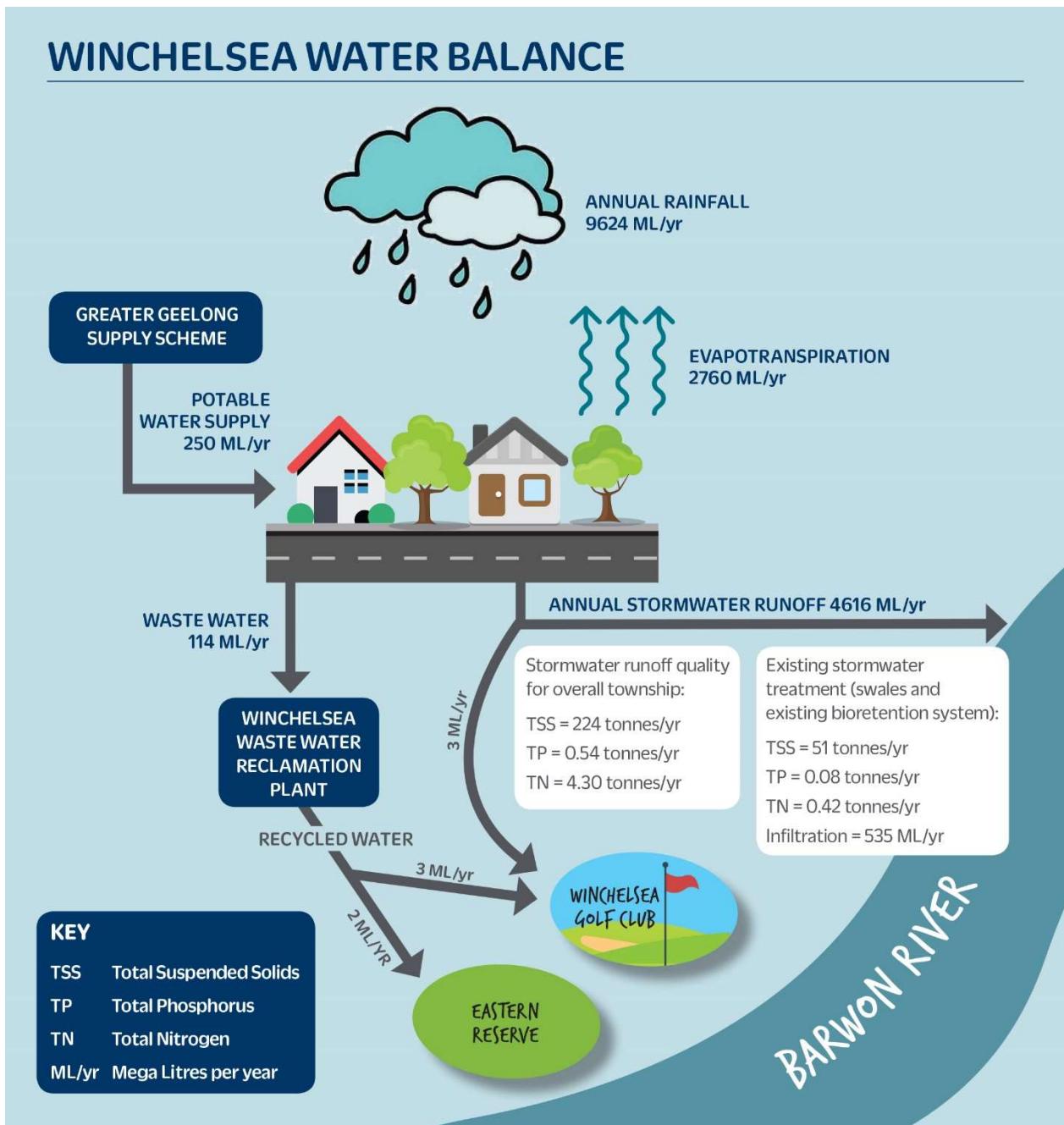


FIGURE 5 WINCHELSEA WATER BALANCE

Strategic context

Trends and drivers

Winchelsea is entering a significant population growth phase, with a 2.2% population increase over the past decade. The local economy is expanding faster than the regional state average (Surf Coast Shire, 2016b). The duplication of the Princes Highway to Geelong has made the area much more accessible and it is identified in the G21 Growth Strategy as the only small to mid-sized town in the region which has potential to accommodate significant growth (G21, 2014).

As the population increases, new land on the edge of the urban area will be developed and some infill development is already occurring. This is bringing forward the need for new and/or upgrade of existing services infrastructure including stormwater, potable water and sewerage as well as increasing the pressure on public open space. Despite this imminent growth, Winchelsea has an ageing population and experiences significant socio-economic disadvantage compared to other towns in the Surf Coast Shire and across Victoria (Surf Coast Shire, 2015).

Situated on the Victorian Volcanic Plains, Winchelsea's soils have formed from the weathering of the basalt. They are sodic, duplex clay-loam soils, with coarse structure and low permeability. They are prone to waterlogging and salinity where high water tables occur. The town has an average annual rainfall of 550mm a year but receives only 150mm on average from November through to March. In these drier, warmer months it can regularly reach temperatures over 35 degrees Celsius. The town experiences a rainfall/evapotranspiration deficit from late September through to April (refer to Figure 6), which makes it difficult for Council and private landholders to maintain green open spaces, lawns and gardens at the time when they are most needed.

Under such conditions, the town is experiencing the full effects of climate change. The rate of warming of the town has increased since 1960 and average rainfall has declined since the 1950s, especially in autumn (South West Climate Change Portal). Overall average annual rainfall loss since 1950 is estimated to be between 100-200mm. At the other extreme, more of the rain that does fall on the town is likely to be in increasingly extreme downpours, which are likely to exceed the capacity of the stormwater network and lead to an increase in localised flooding.

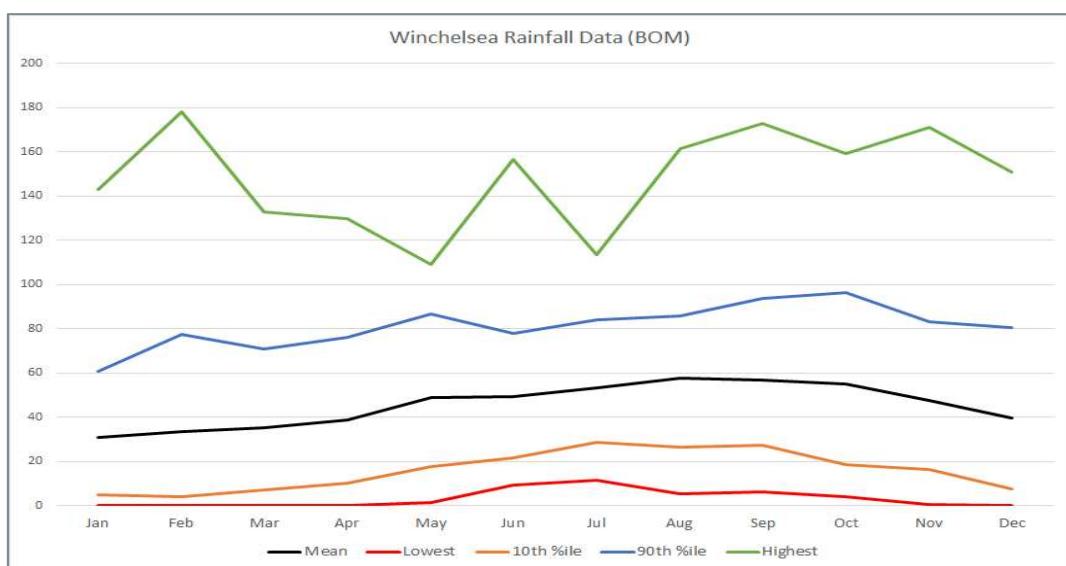


FIGURE 6 SEASONAL RAINFALL DATA (SOURCE: BOM)

Community vision for Winchelsea

Integrated water management is not an end in itself, rather it is a process to discover how the water system could enhance a particular place. The broader aspirations of the community in that place are therefore the starting point for understanding how IWM can add value.

The Growing Winchelsea Strategy, developed in 2015, provides the strategic guidance for the way the town will grow into the future. It sets out a vision and identifies four key strengths upon which to achieve that vision, as shown in Figure 7.

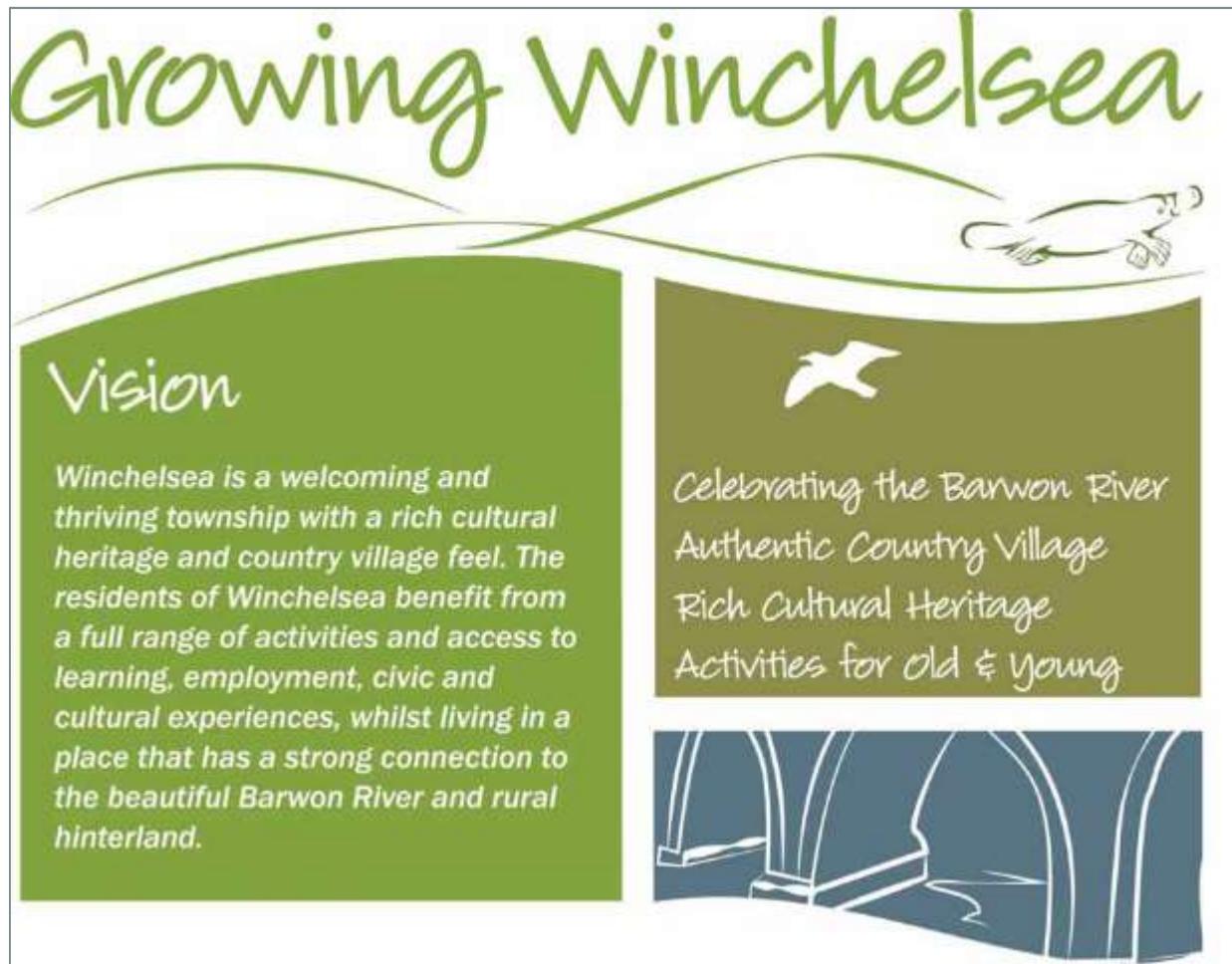


FIGURE 7 GROWING WINCHELSEA COMMUNITY VISION (SURF COAST SHIRE, 2015)

How IWM can support Growing Winchelsea

The urban water cycle plays a significant role in determining the characteristics of a township. This is particularly evident in a township like Winchelsea, where water related aspects play important roles in helping to build on the strengths outlined in Growing Winchelsea, including:

•Celebrating the Barwon River

- Providing a healthy Barwon River for the community and biodiversity
- Ensuring wastewater management protects public health and the environment

•Authentic country village lifestyle

- Providing cooler streetscapes to reduce the urban heat island effect and improve liveability and walkability
- Providing people-friendly urban design new developments
- Retaining water in the urban landscape through surface drainage system

•Rich cultural heritage

- Providing secure water sources to community and business
- Raising awareness of Traditional Owner values and community values of the river

•Activities for old and young

- Providing safe and reliable drinking water
- Connecting people to nature and places through active travel links
- Using alternative water sources to provide greener public open spaces for active lifestyles

To achieve these types of outcomes, it is important to have clear goals. Building on the objectives defined in the IWM Framework for Victoria (DELWP, 2017), the Barwon IWM Forum has developed a framework of outcomes and goals for the application of IWM across the G21 Region. This IWM Outcomes and Goals framework is shown in Appendix 10, but Table 3 shows how the links between these IWM outcomes and the town's key strengths.

Water System aspect	Icon	IWM Outcomes	Growing Winchelsea Strength			
			Celebrating the Barwon River	An authentic country village lifestyle	Rich cultural heritage	Activities for young and old
Water Sources		Safe, secure and affordable supplies in an uncertain future	High	Med	Med	High
Wastewater		Effective and affordable wastewater systems	Med	Low	Low	Med
Flooding, Drainage & Stormwater		Avoided or minimised existing and future flood risks	High	Med	Med	Med
Waterways		Healthy and valued waterways and marine environments	High	Med	Med	High
Urban Landscapes		Healthy and valued urban, agricultural, rural and green landscapes	High	High	High	High
Place based planning		Traditional Owner and community values reflected in place-based planning	High	Med	High	Med
Economy & Innovation		Jobs, economic growth and innovation	High	Med	Med	High

TABLE 2 LINKS BETWEEN WINCHELSEA'S STRENGTHS AND IWM OUTCOMES

Key IWM issues and options

Developing a common understanding of the key water-related issues and options to address these is the basis for the IWM approach. Through a series of workshops and direct feedback, stakeholders identified key issues across each of the seven water system aspects as well as preferred options to tackle these issues.

Whilst many perceived or actual issues were identified, this plan focuses on those which were identified as 'key' IWM issues. These are the problems or challenges which have, or could have significant impact on the broader community aspirations of the town if left unaddressed; and/or require a high degree of integration and collaboration across stakeholders to resolve.

For example, if the ecological health of the Barwon River and its riparian zone through the town is degraded over time, this could directly affect the town's strategic strength to 'Celebrate the Barwon River'. This makes it a key issue in terms of its impact on the community's vision. The challenge of greening the towns key open spaces through greater use of recycled water is an example of a complex, multi-dimensional issue, requiring a shared commitment and collaborative response from the water utility, council and key water using groups and or businesses.

The key issues are organised according to the Barwon IWM Forum outcomes, including an overview and description of the issue followed by a table showing four high level options. These options are arranged on a spectrum from least to best in terms of how well they are likely to address the issue and therefore benefit the town. Options vary according to scope, commitment required, resources and feasibility, with an incremental increase in the 'level of effort' (and assumed effectiveness) from left to right (Figure 8).

It is assumed that each option to the right on the spectrum includes at least the features of all those to the left as well as new features outlined. Note that options are presented a 'tactical level', meaning they reflect what should be included in the response, rather than how each response may be achieved in practice. Such details are discussed in the portfolios section of this report. Options deemed 'unlikely to be acceptable' were not considered further and subsequent opportunities emerged from interpretations of preferred and/or 'possible options'.

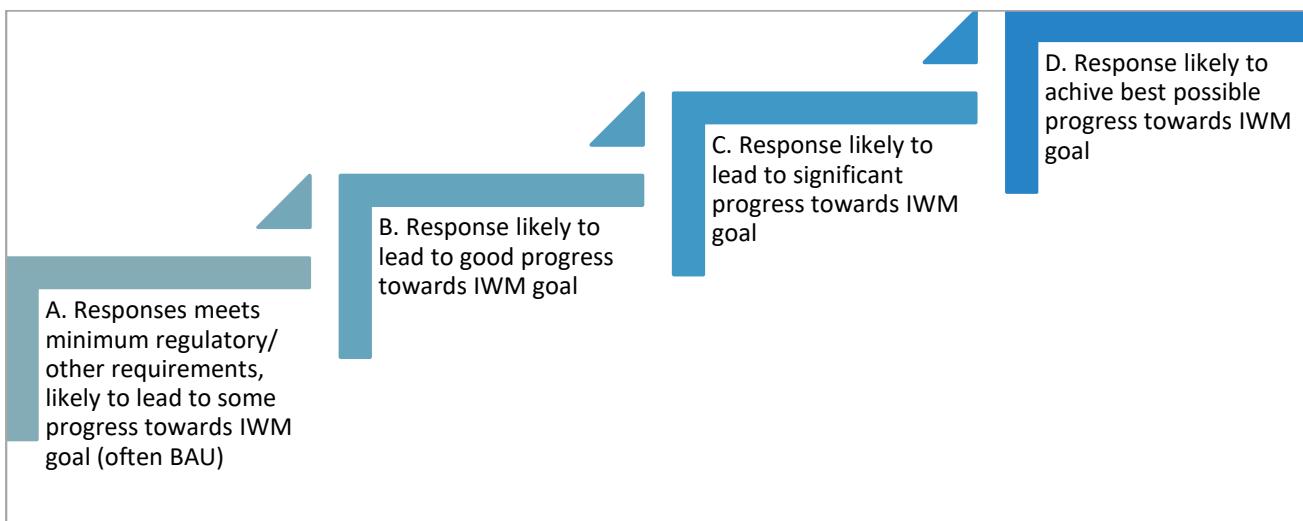


FIGURE 8 OPTIONS SPECTRUM

Winchelsea IWM Plan



FIGURE 9 GREATER GEELONG SUPPLY SCHEME (SOURCE: BARWON WATER)

Water sources

Overview

Barwon Water provides potable (drinking) water service to Winchelsea via the Greater Geelong Supply System (GGSS). Annual usage is around 250ML, of which about 80% is 'residential'. This represents less than 1% of the total annual use across the total GSSS. This system is secure out to 2029 on current projections under a dry climate scenario and there are no main constraints on the reliability or quality of water provided to the Winchelsea Community to that time. Barwon Water will shortly embark on a Water Security Program to consider the next major augmentation for the GSSS (Rhys Bennett, Barwon Water, pers. comm.).

Some upgrades to water distribution assets (pipe sizing) will be required as the town develops. Barwon Water typically prefers development to start in areas closest to the town and existing infrastructure. Existing feeder mains are likely to require upgrades as new development occurs. Barwon Water has scheduled the following water supply network upgrades in its 10-year capital works plan: Winchelsea West Water Supply Improvement, Winchelsea Tank Bypass Pressure Reducing valve (PRV) and the Winchelsea Feeder Main Stage 2 (Rhys Bennett, Barwon Water pers. comm.)

Key issues

Diversity of water sources for use in maintaining valued green open spaces

The town is well serviced with public open space, however only a few key recreational areas are irrigated, namely the Golf Course (with stormwater and Class C recycled water) and Eastern Reserve (with Class C recycled water). Other important public open space areas are not irrigated, including Hesse Street Reserve and the Barwon River surrounds at CWA Park and Lions Park.

The lack of irrigation in these important community assets is primarily due to the prohibitive costs of using drinking water and the relative unsuitability of Class C recycled water in such high use areas. The restrictions associated with the application of Class C recycled water and withholding periods for subsequent activity makes it impractical for a range of operational reasons (Jason Eales, Surf Coast Shire Pers. Comm.).

Providing additional stormwater is not considered practical given the extensive summer rainfall deficit, unreliability of supply and impacts on the river pools from extraction during flow stressed periods. One exception is the potential to provide improved security and quality of stormwater to the Golf Club, by enhancing the existing stormwater harvesting system. Note that this issue is dealt with under the flooding, drainage and stormwater theme.

Extraction of water from the Barwon River was also ruled out due to the flow stressed nature of the river during summer and potential environmental implications. According to the Corangamite CMA, there is a very low likelihood of any new allocations being made available from the River, which already experiences periods of flow-stress (Jayden Wooley, CCMA pers. comm.).

Issue	Option A	Option B	Option C	Option D
Lack of affordable water available to maintain valued green community assets	No change to current water supply mix (95% potable, 3% Class C, 2% stormwater)	Achieve some reduction in potable demand through replacement by fit for purpose alternative water at some additional sites (Class C)	Achieve significant reduction in potable demand through replacement with fit-for-purpose alternative water at more sites (Class B)	Achieve maximum viable reduction in potable demand through replacement with fit for purpose alternative water, suitable at all sites and for other uses (Class A)
Deal breakers	Difficult to expand current level of use with Class C water due to restrictions on use in urban environments	Class C may not be acceptable at some open space sites	Class B likely to be more operationally acceptable at many open space sites. Barwon Water's plant does not yet produce Class B and further work is required to assess this	Very costly in terms of Capex and Opex, more than potable water costs
Comments	Unlikely to be acceptable	Possible	Preferred	Unlikely to be acceptable

Wastewater

Overview

Winchelsea's sewerage is treated by the Wastewater Reclamation Plant located on the north eastern edge of the town adjacent to the Barwon River. According to Barwon Water's Urban Water Strategy the Winchelsea Water Reclamation Plant was built in 1981 to service a population of 1400 people and treats approximately 114 ML per year (Barwon Water, 2017).

The plant does not have a licensed discharge point and all recycled water (Class C) must be retained for irrigation on-site or utilised for beneficial uses off-site (Surf Coast Shire, 2015). Of the total volume of Class C recycled water, most is used to irrigate on site tree-lots. These tree lots are nearing maturity and due for harvesting. About 5ML per year of Class C recycled water is used for irrigation of the Winchelsea Golf Course and at Eastern Reserve. The existing scheme comprises a main trunk rising main from the plant and two branches, one to the west and the Golf Course and the other to the east to Eastern Reserve.

Key issues

Ensuring wastewater treatment meets public and environmental standards

Due to the growth in the town, the plant is nearing its capacity. In 2017 it was operating at 108% of its hydraulic capacity and 83% of its load capacity (Barwon Water, 2017). Given this, the plant may not be able to meet environmental and public health discharge requirements for high flows during winter in its current configuration. This could result in unplanned controlled discharges of treated Class C recycled water during high flow periods to the Barwon River (Rhys Bennett, Barwon Water, pers. comm.).

In light of this, Barwon Water has, or is planning to implement a range of measures to upgrade the WRP commensurate with growth, including creating a new winter storage (underway), aerator upgrade new baffle installation for disinfection, minor improvements and renewals, alum dosing for phosphorus reduction; and investigating a new irrigation area (such as nearby farms and/ or through purchase or lease of additional land).

The new irrigation area would likely be remote from the plant given the extent of surrounding urban development. Barwon Water is also considering investigating options to use recycled water as environmental flows in the Barwon River (Barwon Water, 2017,).

A complimentary option suggested through this plan was to investigate upgrading the plant to be able to treat some of the recycled water to Class B quality, making it more acceptable for greater application in the township. Whilst this does not necessarily assist in resolving the plant's capacity issues, it may help provide valuable affordable water to green the township.

Zero waste = recycled water?

Through its 2030 Strategic Plan, Barwon Water has set itself a goal of Zero Waste. This includes a target to achieve '100 per cent water recycling from our wastewater treatment plants' (Barwon Water, 2017, p.31).

A key measure of Barwon Water's success towards this goal is to help green the region's cities and towns.

'By 2023...We have secured alternative water supplies for the region's priority sporting and recreational facilities to limit the impact of future dry conditions' (Barwon Water 2017).

Issue/ Opportunity	Option A	Option B	Option C	Option D
WTP meeting public health and environmental standards	No change to existing treatment plant	Undertake planned works including new winter storage and secure new irrigation area remote from plant	Undertake planned works including new winter storage and secure new irrigation area remote from plant. Upgrade to produce some water at Class B for use in some greening the township applications	Undertake planned works including new winter storage and secure new irrigation area remote from plant. Upgrade to produce some water at Class A for use in all greening the township applications
Deal-breakers	Not acceptable socially, environmentally, politically, economically	Class C water may not be suitable for broader application in town	Class B could improve use in town	Class A water is not economically viable given volume to be produced
Assessment	Unlikely to be acceptable	Possible	Preferred	Unlikely to be acceptable

Maximising beneficial reuse of recycled water for the township

This issue is similar to the previous issue but focuses specifically on the extent of reuse of recycled water within the township, as opposed to beneficial reuse from application outside the township, such as agriculture or horticulture.

Barwon Water has a long-term goal to achieve Zero Waste, which includes recycled water from its water reclamation plants. One of the key tactics to achieve this goal is to ‘Develop a plan to increase the use of recycled water, including, supporting local government to use recycled water for green spaces and new liveability options (e.g. wetlands) (Barwon Water, 2017).

As noted in the previous option, Class C can be used to irrigate public open spaces under strict conditions, but council staff have indicated a strong preference for water of a better class than Class C, as this is assumed, therefore to be safer given human contact issues and allow for more practical application. The options to address this issue have been framed to reflect the allocation and use of affordable, safe recycled water for use in the township.



FIGURE 10 NEW WINTER STORAGE AT WINCHELSEA WRP

Issue	Option A	Option B	Option C	Option D
Maximise beneficial reuse of recycled water for the town	No change to proportion of recycled water reused in the township context (approximately 3%) and no allocation made for future use	Allocation of approximately 10% of available recycled water for use in the township, Class C	Allocation of 15% of available recycled water is for use within the township with Class B upgrade	An allocation of 20% of available recycled water is for use within the township and associated needs with Class B upgrade
Deal breakers	Not aligned with BW strategic goals	Class C water poses substantial restrictions; May not meet future needs	Class B may pose fewer restrictions on use; volume may not meet future demand if Barwon Park mansion is included	Should be sufficient volume to meet longer term demands
Assessment	Unlikely to be acceptable	Unlikely to be acceptable	Possible	Preferred

Flooding, drainage and stormwater

Overview

The town is located near the base of the Otways with a large catchment and the river is therefore subject to floods after large rainfall events upstream. This can cause short term minor flooding along the Barwon River parklands.

Most of these areas are relatively clear of housing or infrastructure, but there is a Recreational Vehicle (RV) friendly overnight camp which needs to be forewarned. The community in general has a good understanding of flood issues and risks associated with river level fluctuations.

The town is relatively flat and has 19 different stormwater sub-catchments. About 60% of the developed area of the town is serviced with an above-ground drainage and stormwater network of grassed swales, spoon drains, and deeper incised earthen drains, some of which are concrete lined.

The remainder of the town is serviced by underground stormwater drainage. In both cases, sub catchments drain to the river and can present problems with water quality and litter, often at the highest use zones along the river corridor.

The above ground network requires limited maintenance but localised nuisance flooding can be a minor issue after major rain events. The swales also help to slow water flows and help to improve water quality.

The above ground stormwater network is generally cheaper to install given the extensive rock underlying the town and also helps to maintain water in the streetscape where it can provide passive irrigation to street trees and help cool the wide streetscapes. The underground stormwater network is ageing in some of the older areas of the town but funds for renewals and upgrades are limited. Most stormwater and drainage works are reactive.



FIGURE 11 GRASSED SWALE

Love swales

About 60% of Winchelsea is still serviced by grassed swales for urban drainage and stormwater.

Whilst swales might not seem as neat as concrete kerb and channel to some, they are much better for cooling streets and houses.

Swales collect and transport water slower than pipes. They filter and clean the water before it goes to the river.

They can be used to passively water street trees and help to cool the footpaths and houses.

Key issues

Ensuring existing stormwater outlets meet best practice requirements

Of the 19 stormwater outlets discharging into the Barwon River, none have gross pollutant traps in place or end of line detention and retention, mainly due to the age of the infrastructure. Some outlets are co-located at important access nodes to the river corridor, including Hesse Street (south), Armytage Street and the Lions Park. At these three nodes water sensitive urban design (WSUD) approaches could be employed to control flows, enhance treatment and ensure controlled release into the river. In each of these three locations, access to the river corridor could be improved simultaneously with WSUD works.

Issue/ Opportunity	Option A	Option B	Option C	Option D
Ensuring stormwater outlets meet best practice requirements	Do nothing	Reactive, risk-based approach to the management of degraded stormwater outlets	Strategic approach to address outlets at key access nodes and where opportunities aligned with council priorities	Strategic approach to upgrade all stormwater outlets based on risk
Deal-breakers	Not acceptable to the community; will not enhance the quality of the river	Business as usual; due to finite funds; will not enhance the quality of the river; cost to council and community through unplanned expenses, ongoing issues	Strategic approach; takes advantage of niche opportunities and funding	Could take years to implement due to limited funding, risk and cost benefit unlikely to support funding possibilities
Comments	Unlikely to be acceptable	Possible	Preferred	Possible

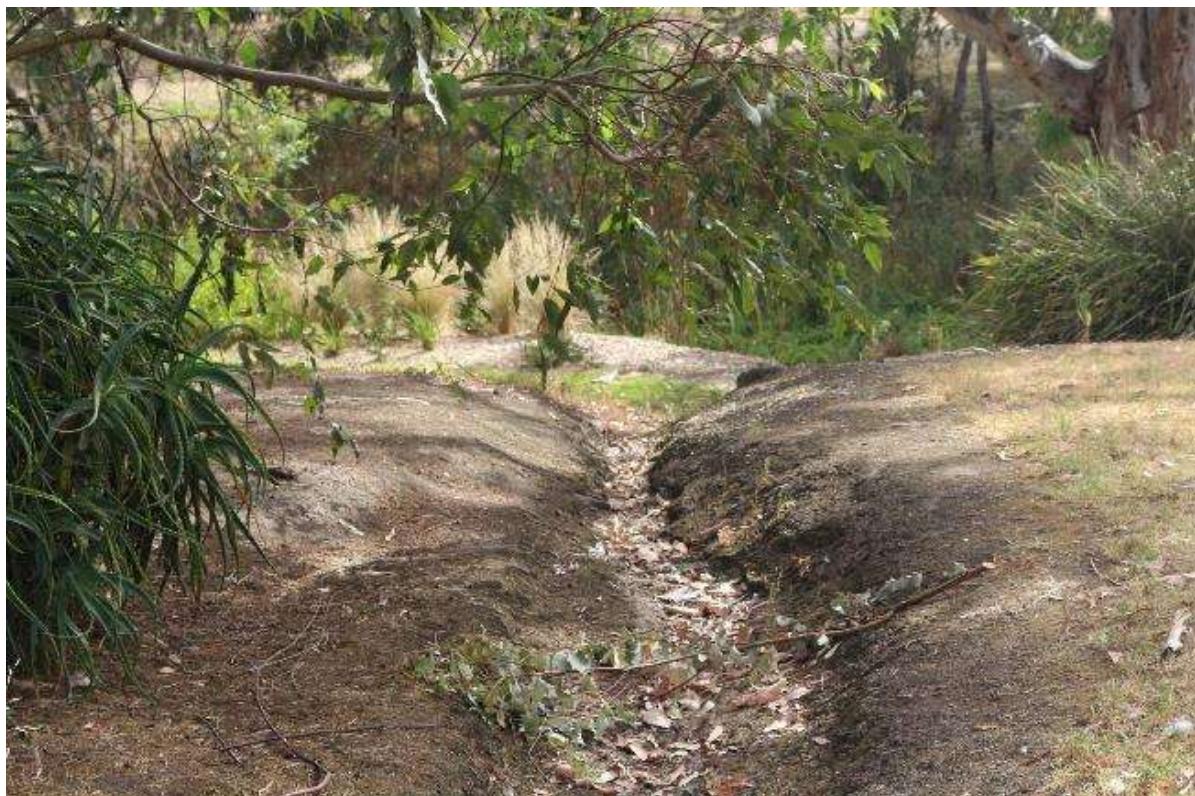


FIGURE 12 ERODING STORMWATER OUTLET, ARMYTAGE ST

Applying IWM consistently in new developments

Infill development is now adding to the volumes directed to the ageing underground stormwater network, which could increase failure rates and fast track major upgrades to cope with future development. However, statewide planning legislation sets the minimum standards for such works and Council has limited levers to encourage developers to apply enhanced standards.

New developments on the edge of the existing urban area offer opportunities to put in place sub catchment scale surface-based drainage and stormwater that retains and reuses as much water as possible at source rather than direct it into the existing stormwater network. At the same time detention ponds could be more multifunctional and part of the open space network.

Issue	Option A	Option B	Option D	Option C
IWM approach in new developments	No change to current process	Reactive, risk-based approach to inform drainage and stormwater plans in new urban development	Develop sub-catchment scale drainage and stormwater plans and guidance to support IWM in all new growth areas	Develop sub-catchment scale drainage and stormwater plans that integrate all IWM outcomes and mandated with statutory support
Deal-breakers	Not in line with government policy directions, or community expectations	Cost to council and community through unplanned expenses; ongoing issues	Could be higher cost to developer; needs acceptance by developer; could be hard to enforce due to staged developments	Needs stated planning link to be enforceable
Comments	Unlikely to be acceptable	Possible	Preferred	Unlikely to be acceptable

Retention of stormwater to support Golf Course

The Winchelsea Golf Course is the major user of Class C recycled water in the town and also harvests some stormwater when available. The stormwater compliments the recycled water and comes at lower cost and is often better quality, coming from new urban development's west of Winchelsea-Deans Marsh Road. The drain through the course runs via an existing dam, with no prior sediment detention and treatment. When full, the dam overflows via an existing drain into the river, where erosion is occurring at the discharge point.

Anecdotal reports from the Golf Club state that stormwater flows and velocity have increased since the new development, causing localised flooding and water-logging on the course, as well as affecting course access and the new Playground on Dwyer Street. The detention and reuse of additional stormwater is limited by the localised drainage issues. If addressed simultaneously, a WSUD based drainage approach could greatly enhance the amenity value of the course and environs and provide public access along the rehabilitated waterway draining to the river.

Issue	Option A	Option B	Option C	Option D
Greater use of stormwater at Golf Course	Do nothing, retain existing reuse profile	Improve volume of stormwater retention for reuse in the Golf Course	Improve drainage issues and reuse opportunity as well as drain rehabilitation	Develop drainage plan from new subdivisions to new stormwater retention system within the Golf Course to allow for higher level of reuse
Deal-breakers	Not acceptable to community; environmentally problematic	Does not improve stormwater or drainage issues	Addresses access, storage, quality and amenity	Restricted by catchment area and flows; higher volume may not be available
Comments	Unlikely to be acceptable	Possible	Preferred	Possible

Waterways

Overview

Winchelsea's defining geographic feature is the Barwon River, which bisects the town from south to north. The environmental and recreational values of this reach of the river are highly valued by the community and it provides an important central spine for walkability in the town.

The river itself is slow moving, with mud and gravel bottom and a key feature is a rocky basalt cascade just upstream of Hesse Street south. The reach has an overall condition rating of Moderate under the third Index of Stream Condition Assessment (ISC). It scores highest for aquatic zone with 8/10, 6/10 for both streamside zone and water quality and 5/10 for physical form. It scores only 4/10 for hydrology, meaning that flows are highly modified¹.

Along its length through the town, the river retains significant natural in-stream and riparian values, especially River Red Gums, *Eucalyptus camaldulensis*, which make it attractive for many forms of active and passive recreation. The area is also subject to a Significant Landscape Overlay.

The western bank south of the bridge is steep and relatively inaccessible whilst the northern section and most of the western bank is easy to access and has considerable adjoining public open space parkland. Part of this area north of the bridge adjacent to the swimming pool is now used as a formal overnight camp site for RVs and caravans. Access to and along the river is not continuous due to the private land tenures to the river on very old titles and geographic barriers such as the highway. The Council is attempting to establish a limited loop-trail by building a new crossing at Hesse St south and an under-bridge path at the highway. The protection and enhancement of the Barwon River environment is one of four strategic themes highlighted in the Growing Winchelsea Plan. The Barwon Land and Rivercare Group and other community interest groups have been actively working with the Shire and the CMA for many years to manage pest plants and animals along the river, but in some harder-to-reach sections, infestations are beyond the control of existing resources.

Key issues

Improving river values through a coordinated approach

The Barwon River through the town is one of Winchelsea's most significant attractions and many different works and assets have been developed over the years to improve the social and environmental values of the river. Yet, despite its significance, there has never been a coordinated approach to activities associated with the river corridor through the town precinct. The pathways, connectivity, flooding, stormwater, open space quality and access to the river are all issues which could be addressed through a coordinated approach with community.

¹http://www.depi.vic.gov.au/__data/assets/pdf_file/0018/200583/ISC_Part10_Corangamite.pdf

Issue	Option A	Option B	Option C	Option D
Improving river access and values through a coordinated approach	Do nothing	SCS to coordinate ad-hoc improvements to access, amenity and environment with some cross-stakeholder efforts	Strategically focus improvements to the riverbank with some collaborative approaches with key stakeholders	Develop whole of river corridor approach in partnership with community and stakeholders and fund improvements with business proposals for larger initiatives
Deal-breakers	Not acceptable for the community given Growing Winchelsea goals	Does not necessarily take advantage of synergies in planning	Maybe possible, but lacking agreed plan could lead to continued issues	Overall plan preferably implemented into existing planning processes inform future actions; involve all stakeholders"
Comments	Unlikely to be acceptable	Possible	Possible	Preferred

Urban landscapes

Overview

According to the Councils Open Space Strategy (Surf Coast Shire, 2016), Winchelsea is very well serviced by Public Open Space, including parklands, gardens and outdoor sport out to 2035 and beyond. The Winchelsea Golf Club, at 27Ha is the largest parcel of outdoor sport space and the 12.2 ha Winchelsea Common, which is being rehabilitated contains nationally significant basalt plains grassland communities. The new Eastern Reserve acquisition will allow for a second full-size oval.

The extent of passive open space (parklands and gardens) also meets community demands, especially along the river, however access to a continuous loop trail is limited (Surf Coast Shire, 2016). Much of the public open space adjoining the river is Crown land, with management divided between DELWP and Council. There are some areas of Council freehold land and several areas of private freehold land. The area includes both active and passive open space, including the swimming pool and playground on the eastern side downstream of the bridge.

The existing gravel trail extends along the west bank from the lower Barwon Hotel downstream to Armytage street, where a low-level crossing spans the river to the east bank. The path loops back along the east bank but access under the road bridge is not possible. Informal tracks exist up to Hesse Street where a new river crossing is proposed.

Community consultation for Growing Winchelsea highlighted the importance of the Barwon River and its' surrounds to the community. Improving connections to and around the river is one of the highest priorities and the development of a Barwon River Loop Walk was the top ranked community opportunity (Surf Coast Shire, 2015).

Many of the town's streets have very wide road reserves, which present an issue for traffic speeds but at the same time present an opportunity for greening with street trees and surface-based, water-sensitive urban stormwater management. This is particularly important given the potential impact of the urban heat island effect in an ageing community living in older style housing. A key challenge for council is prevent poor quality subdivisions which lack amenity and do not fit in with the local township character and environment.

Key issues

Greening public open space with cost effective, alternative water

Many of the town's key recreation areas are in poor quality in terms of their turf and adjoining landscaping. This is primarily due to the high cost of providing drinking water and the practical unsuitability of Class C water for areas of high recreational contact ('high use'). Greening key open spaces could potentially provide local, regional and even broader benefits. For example, active irrigation of the turf and landscaping of the Hesse St Reserve will enhance its amenity to all adjoining users, including the Bowls Club, Cricket Club, Tennis Club and Men's Shed.

A key restraint on greater use of recycled water in these areas is the level of pathogens in the water and the risks these pose to public health. The Plant currently produces Class C water, but Barwon Water are considering investigating the possibility of producing Class B recycled water. Class B water has undergone a level of disinfection and while still containing residual pathogens, provides greater flexibility with operational application, such as irrigation Indicative Timeframe and buffer distances.

Advice from Barwon Water is that Class A water would be too costly to construct and operate to be able to provide cost effective non-potable water for irrigation of active and passive open space. Note that providing recycled water to any of the proposed new areas would be subject to appropriate communications and engagement with neighbouring properties, community consultation and funding.

Another example is the trail surrounding the Water Reclamation Plant. This extensive passive open space area could be transformed into Winchelsea's own Arboretum, using recycled water to protect and enhance existing native vegetation and encourage innovative plantings of new species from elsewhere (Jason Eales, Surf Coast Shire, pers. comm).

Issue	Option A	Option B	Option C	Option D
Greening active and passive areas with cost effective, suitable water servicing	Current network of Class C to limited POS sites	Extend Class C network to some suitable sites	Upgrade recycled water quality to Class B quality to enable irrigation of additional sites	Upgrade to recycled water quality to Class A quality to enable irrigation at all active and passive recreation sites
Deal-breakers	Does not add to the greening of the town	Class C water for high use urban landscapes and turf can pose health issues and is very difficult to achieve in practice with restricted operations. Drippers for trees may be possible, but not turf.	Class B includes disinfection, which reduces risks associated with contact; still requires careful risk management of application, but could be more suitable	Very costly; exceeds cost of potable water to create; not an economically viable option given small volumes
Comments	Unlikely to be acceptable	Possible	Preferred	Unlikely to be acceptable

New urban streetscapes in keeping with town character

A key challenge for council is meeting community concerns that new urban development will be planned and managed to be in keeping with the towns history and character and its desire to retain a country lifestyle feel. This is reflected in a growing sense of community opposition to standard density, low cost subdivisions which lack amenity and do not fit in with the local township character and environment. Such views need to be balanced with other drivers designed to support more affordable housing. Many factors influence the character of new urban areas, such as the layout and landscaping of streets, blocks, block size and orientation as well as the built form of houses, their style and appearance from the street. Some of these factors, particularly streetscapes, can be affected by how water interfaces with the urban landscape, particularly the conveyance of stormwater and major drainage flows.

Most existing streets within the town are very wide, with grass swales and often trees between the road pavement and the footpath. These wide areas, if well maintained can help soften and cool the urban streetscape. From an urban landscape perspective, water sensitive urban design aspects such as retaining wide streets and above ground stormwater conveyance, as well as street trees could help ensure that new urban development are in keeping with the country village character of the town. Given the level of open space in the town, consideration could be given to reducing minimum open space requirements within new subdivisions in favour of wider, cooler streets.

Options to address this issue assume that water cycle related aspects can mostly influence the streetscape and layout of new developments, not the built form of houses in that development, which are influenced by other aspects of urban planning. Options that apply water sensitive urban design both at a sub catchment scale and streetscape scale are preferred to those which do not.

Issue	Option A	Option B	Option C	Option D
New urban streetscapes in keeping with the character of the town	Do nothing	Collaborate with developers of new urban areas to ensure they maintain the town's streetscape character, incorporating IWM principles	Establish guidelines for all new developments to allow for water sensitive urban design incorporated into wider, greener streets and enhance connectivity	Adopt a new clause in the Municipal Planning Scheme which requires developers to apply water sensitive urban design incorporated into wider, greener streets and enhance connectivity
Deal-breakers	May not be acceptable to community	Could be additional cost to developer which may need to be offset	Likely to be unpopular with developers, could be difficult to enforce	Likely to be unpopular with developers
Comments	Unlikely to be acceptable	Possible	Preferred	Possible

Managing urban heat island in existing wide streetscapes

One of the most significant impact of future temperature rises is the risk of increasing the urban heat island effect on the ageing population. This effect could be considerable in Winchelsea, due to its north-west street grid orientation and very wide, barren streets. A general lack of large street trees (more than 50% of all house blocks do not have street trees providing adequate shading) means that the wide streets are exposed for most of the day. The bitumen, gravel and concrete footpaths collect and store solar radiation, turning the streets into major heat storages during the day and drying out the surrounding landscape.

Work conducted on this urban heat island effect by the City of Greater Geelong demonstrated that shaded grassed parkland areas were up to 20 degrees Celsius cooler than major street intersections on hot days (above 35 C) in February. These extremes at the streetscape level can contribute to adverse health and wellbeing issues including heat distress, dehydration and heat stroke, especially for vulnerable segments of community such as the elderly.

The fact that almost 60% of the town is still serviced by a surface drainage and stormwater network of grassed swales is a major asset in retaining water for greener, cooler streetscapes and adds to climate change resilience. A trial of Class C via drippers could be done at relatively low cost if it comes off the existing recycled water network on a street where the pipe exists (Rhys Bennett, Barwon Water, pers. comm).

Issue	Option A	Option B	Option C	Option D
Managing heat island effect in existing wide streetscapes	Do nothing	Conduct proposed street tree replacement program; Implement a cooler streetscape trial in one street	Conduct street tree replacement program with irrigation by drippers where viable; conduct trial for new advanced trees with irrigation (Class C via drippers) including WSUD features and or at several sites	Develop a whole of township urban forest plan featuring street greening options with WSUD, and road confinement
Deal-breakers	Does not address the likely increase in heat island effect at streetscape scale	In line with existing Street Tree annual Plan; could be Bennett Street Avenue of Honour	Could be incorporated with proposed pathways	Limited external funding available; could be expensive
Comments	Unlikely to be acceptable	Preferred	Possible	Unlikely to be acceptable

Enhancing river loop access with WSUD features

Improving connections to and around the river is one of the highest priorities of the community. The development of the Barwon River Loop Walk is the top ranked community opportunity. To become a genuine loop, the existing gravel trail needs several key connections and enhancements, particularly under the bridge on the east bank, across the river at the river end of Hesse Street and at the low-level crossing at Armytage Street. These three sites also feature stormwater discharge into the river.

A new footbridge is currently in planning at the southern end of Hesse Street where it meets the river. Council is planning to develop an under-bridge walkway on the eastern bank. However, the access down to the new Hesse St bridge is very steep and is currently difficult to navigate for pedestrians, with no formal walkway. At the same time, two open drains convey stormwater water down the steep incline and overland to the river. This site could incorporate water sensitive urban design and improved pedestrian access down the slope to provide an integrated management water solution.

Similarly, the current access to the river pathway at the eastern end of Armytage Street sits alongside two major stormwater discharge points, one is a large diameter pipe carrying stormwater from as far west as the Princes Highway gateway and the other is an open stormwater drain carrying water down Armytage Street. Both could be improved through water sensitive urban design features, which could be done in synergy with improved access.

Another key area is Lions Park below the Barwon Hotel, where stormwater poses a periodic issue for council and some scouring is occurring near the bridge underpass (west bank). The amenity and access in area could also be improved with water sensitive urban design. The options for this issue focus on the level of integration of aspects of improved access and walkability with aspects of improved stormwater management through ‘water sensitive urban design’. By considering the two, council could enhance the stability and amenity of these critical accessibility connections.

Issue	Option A	Option B	Option C	Option D
Enhancing river loop access with WSUD features	Planning for pedestrian access proceeds with no consideration of stormwater issues at key access points	Planning for pedestrian access proceeds with some consideration of stormwater issues at key access points but limited scope for WSUD	Council seizes opportunity to combine both access improvements with stormwater improvements through WSUD	Council seizes opportunity to combine both access improvements with stormwater improvements through WSUD and explores further opportunities and funding
Deal-breakers	No longer considered best practice from a planning and design perspective; does not add value	Minimum would be to consider WSUD features to enhance access, could be limited due to funding availability for such upgrades	Could be limited to what council can do within its own budget constraints	Reflects desire for longer term system improvements that add value and can involve multiple funding partners
Comments	Unlikely to be acceptable	Possible	Possible	Preferred

Community values of water

Overview

The Winchelsea community is traditionally tight knit and predominantly oriented towards the farming base. However, this is changing, with an influx of new residents who do not rely on agriculture as the prime sources of economic support. A key concern of the community is managing growth and development in such a way that reflects the town's history and its desire for a country lifestyle.

The town has a strong aboriginal cultural significance, both to the Wadawurrung and to the Eastern Marr groups. However, the expression of these values through cultural aspects and education is limited. With the significant growth occurring in what is a traditional country town, the community has expressed a willingness to become more involved in the decisions that shape its future. This was evident in the strong involvement in the growing Winchelsea Plan.

Key issues

Acknowledging and protecting Aboriginal cultural values associated with waterways

The town has a strong aboriginal cultural significance, both to the Wathaurung Traditional Owners on the east bank of the river and to the Eastern Marr group on the west bank of the river. These are the first people of the region. Aboriginal cultural values associated with the waterways and landscape are different and distinct to European historical values and it is important to aboriginal people that these stories remain distinct.

The intersection of these two cultures at the Barwon River represents a unique opportunity to demonstrate the extensive history and current continued aboriginal connection to land, the river and the area. Currently, the level of awareness of this history and connection is limited in the broader community. Options should consider the extent of values acknowledged, understood, protected and applied.

Issue	Option A	Option B	Option C	Option D
Low level of awareness of aboriginal values associated with waterways	No change	Traditional owners consulted in identifying aboriginal values; some enhancement of values and communication	Traditional owners involved in identifying Aboriginal cultural values, including developing a plan to incorporate into future works and communicated to the community	Traditional owners lead a process of identifying and enhancing aboriginal cultural values and a plan to ensure aboriginal cultural values are acknowledged, understood and applied
Deal-breakers	Not consistent with state policy directions	Not ideal as it does provide a platform for ongoing commitment		Recognises the role of Traditional Owners in telling their stories; distinguishes aboriginal from European history
Comments	Unlikely to be acceptable	May not be acceptable	Possible	Preferred

Engaging the community in water related activities

With the significant growth occurring in what is a traditional country town, the community has expressed a willingness to become more involved in the decisions that shape its future. This includes the Barwon River, open spaces and the overall feel of the town's urban landscape. This was evident in the strong involvement in the growing Winchelsea Plan and continues with the Growing Winchelsea Group, Barwon River Land care Group and other community interest groups. There has been limited engagement of the community around IWM related opportunities in the past, yet considerable opportunities to promote the benefits of IWM exist across the township. Options should consider the extent of engagement to understand cultural and community values of water.

Issue	Option A	Option B	Option C	Option D
Engaging the community in water related activities	Do nothing	Ad hoc inclusion of values of waterways with improvement works	Integration of key education messages into some IWM Opportunities	Develop overall plan for community engagement focused on water related values with stakeholders
Deal-breakers	Not consistent with Growing Winchelsea	Does not necessarily result in improved engagement		Could be incorporated into overall approach
Comments	Unlikely to be acceptable	Unlikely to be acceptable	Possible	Preferred

Jobs, economic growth and innovation

Overview

Winchelsea has a main shopping centre precinct located at Main Street, just west of the river at the bridge and a strip of shops along the Princes Highway east of the River.

One of the town's defining features is the recently duplicated Princes Highway runs through the middle of the town. It provides the gateway to the town. The landscaping of the verges and medians does not have irrigation, so during summer months these areas are less visually appealing than they could be. Some artistic assets are planned to enhance these gateways but making these areas cool and green through irrigated and well-maintained turf and plantings, as well as the Main Street precinct, would be a major signal to promote a more prosperous township. There are also active travel access restrictions along the highway out to the business estate, which could be alleviated with improved landscaping. It is understood that VicRoads have concerns around adding more water to verges and medians due to potential impact on road pavement life so any opportunities would need to be developed further in consultation with VicRoads. Alternatives could include low water use indigenous species which do not require irrigation to look good.

The RV Park on the banks of the Barwon River is an important asset to help improve the local economy. It is currently informal but could benefit from targeted improvements such as levelling and better drainage and stormwater management to improve amenity and attractiveness to users.

Improving the overall attractiveness of the town, including the highway gateways, the streetscapes and major open spaces and attractions is a major opportunity which could help drive tourism numbers and economic benefits.

Key issues

Reactivating Barwon Park Mansion with recycled water

Another potential economic opportunity is to enhance the economic values of the state heritage listed Barwon Park Homestead complex managed by the National Trust. This area, which is close to the Water Reclamation Plant on the town's north east, once boasted extensive vegetable gardens, formal gardens and orchards. Already a major tourist attraction, recycled water could help to reactivate and reinvigorate the mansion's surrounds, as well as present opportunities for direct sources of water-based revenue for Barwon Park and the local community, such as a community supported horticulture/agriculture venture on the site, producing high quality foodstuffs which could be marketed at the mansion or in the town, taking advantage of the burgeoning interest in niche local goods along the Otway Harvest Trail. Such an enterprise could present significant new job opportunities for the town. However, a key challenge for the Trust is their limited resources as a Not-for Profit organisation and the risk of raising expectations around the upgrades and possibilities.

Issues	Option A	Option B	Option C	Option D
Reactivating Barwon Park Mansion with recycled water	Do nothing	Provide Class C recycled water to some suitable areas in the surrounds	Provide suitable Class B recycled water to reinvigorate the gardens and surrounds	Enable Class B recycled water supply to support development of a commercial, community supported horticulture venture, producing high quality foodstuffs for marketing and providing local employment
Deal-breakers	Not preferred	Cost	Cost	Likely to require extensive planning and support from multiple players; requires extensive long-term resourcing and commitment
Comments	Possible	Possible	Possible	Preferred

IWM Opportunities

After identifying preferred options to address the key issues, stakeholders performed a priority setting exercise to identify those options which warranted further investigation and development as potential IWM opportunities. This step is necessary in order to maximize effectiveness of the Plan and make use of the time, capability and limited resources available. Three criteria were adopted:

- Impact – likely impact of addressing the issues in terms of achieving the town's vision (namely, Celebrating the Barwon River, An authentic country village lifestyle, Activities for old and young and Rich cultural heritage);
- Ease of implementation – likely ability to implement the opportunity given resources, scale, capability, synergies and barriers;
- Acceptability – likely support from stakeholders and the community in general.

Based on this assessment several themes emerged as priorities to address;

- Adopting a coordinated approach to enhancing the Barwon River and its role as the central spine for active travel in the town, including combining accessibility and stormwater improvements at several key access nodes
- Investigating the potential to extend and enhance the recycled water scheme to help green the township;
- Cooling the wide streetscapes through tree and landscape enhancement
- Investigating the potential to improve drainage, public access, stormwater quality and biodiversity in the Dwyer St drain and provide more stormwater to the Golf Course
- Establishing better processes to encourage adoption of IWM in new developments (including wider, greener streets and enhanced connectivity)
- Reinvigorating and activating the economic and social values of Barwon Park Mansion and surrounds through access to recycled water.

Based on these themes, the shortlisted opportunities were combined into IWM 'portfolios, based on opportunities that address a common issue or issues; occur at a common location; contribute to a common community outcome; or if implemented in an integrated manner, they offer potential for multiple benefits, enhanced efficiencies and/or effectiveness through economies of scale or Indicative Timeframe of implementation. They are also designed to stimulate interest in water's role in the town's future and act as catalysts for commitment to collaborative actions.

FIVE IWM PORTFOLIOS HAVE BEEN IDENTIFIED, CONSISTENT WITH THE THEMES OUTLINED IN GROWING WINCHELSEA.

1. ENHANCING THE BARWON RIVER (CELEBRATING THE BARWON RIVER)
2. COOLER, COUNTRY STREETSCAPES (AN AUTHENTIC COUNTRY VILLAGE LIFESTYLE)
3. SMART STORMWATER, GREENER GOLF (ACTIVITIES FOR OLD AND YOUNG)
4. RECYCLED WATER FOR GREENER, HEALTHY SPACES (ACTIVITIES FOR OLD AND YOUNG)
5. GREENING, GROWING BARWON PARK (RICH CULTURAL HERITAGE)

In addition to these portfolios of IWM opportunities, three site-based IWM Concept Plans are presented. These sites are important public access nodes to the Barwon River and also present water related challenges, mainly stormwater management. Given Council is also conducting or planning to undertake site-based works to improve the access and amenity at these sites and integrated solution offers multiple benefits.

L01 – LIONS PARK REVITALISATION.

A01 ARMYTAGE STREET RIVER ACCESS NODE

H01 – HESSE STREET RIVER ACCESS NODE

Notes on opportunities, portfolios and concepts

The following sections present the outputs of the IWM planning process in the form of IWM opportunities, IWM Portfolios and several concept plans. Note the following with respect to these outputs and potential implementation:

- The expected IWM benefits are the goals from the Barwon Forum IWM Outcomes and Goals Framework (Barwon IWM Strategic Directions Statement) which are most likely to be achieved if the opportunity/ portfolio is implemented. The numbering of these benefits is based on that shown in Appendix 10.
- Costs are indicative and concept level only; they are based on estimates and/or figures provided by stakeholders and +/- 30% accuracy
- Numbers identified in the IWM benefits matrix refers to the relevant Barwon SDS IWM Goal (Appendix 11).
- The ‘suggested lead’ is the agency/ organization who may be best placed to lead implementation of a particular opportunity should it be endorsed; however, it is expected that opportunities taken to the next stage of planning (and then potentially) implementation would likely be collaborative efforts between interested parties
 - SCS = Surf Coast Shire
 - BW = Barwon Water
 - CCMA = Corangamite CMA
 - NTV = National Trust (Victoria)
 - WGC= Winchelsea Golf Club
- The ‘timeframe for implementation’ suggests an indicative timeframe for planning and implementing the project, given a range of factors including project life cycle of the opportunity, perceived priority by the Council, community and stakeholders, funding availability, commitment from partner organizations etc. This suggested timeframe is not binding on any party.
 - Short term – plan to implement within next 2 years
 - Medium term – plan to implement within next 5 years
 - Long term – plan to implement within next 10 years
- The opportunities and portfolios are subject to further approval and would require additional design work (at additional cost) to be project ready.

Portfolio 1 Enhancing the Barwon River

Overview

This portfolio brings together all existing, planned and potential opportunities related to enhancing the Barwon River through Winchelsea. It recognises the importance of the river to the town's sustainability, prosperity and liveability and seeks ensure a coordinated, strategic approach to improving river health, amenity and accessibility over the long term. Enhancing Winchelsea's reputation as a preferred first stop from Melbourne for travellers, encouraging travellers to take a break drive safely and appreciate the amenity of this iconic river scenery.

Features include:

- Presenting all Opportunities in a consolidated manner to encourage a whole-of-river approach in partnership with community and stakeholders and as a catalyst to secure funding for major initiatives;
- Highlighting the opportunity to leverage existing pedestrian access-related initiatives to simultaneously address stormwater discharge issues at key access nodes;
- Identifying all planned and potential pathway connections to complete the Barwon River Trail;
- Recognising the cultural and environmental sensitivity of the corridor and enhancing the cultural, educational and interpretative value of the river.

Expected IWM benefits

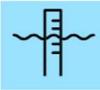
				
<p>3.1 Community and property resilience to local flood risk 3.2 Prevent the likelihood of contamination via runoff 3.3 Meets best practice water quality requirements</p>	<p>4.1 Improved river health and understanding</p>	<p>5.2 Improved connectivity and access to green and blue spaces 5.4 Waterways accessible as valuable open space</p>	<p>6.1 Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied 6.3 Effectively engaging communities to better understand cultural and community values</p>	<p>7.1 IWM enables jobs and economic growth</p>



FIGURE 13 ARMYTAGE ST STORMWATER OUTLET



FIGURE 14 INFORMAL PATH FROM HESSE ST



FIGURE 15 LOW LEVEL CROSSING RV PARK

Opportunities

Reference	Opportunity	Status	Indicative Timeframe	Cost	Lead
1.01	Pathway from Playground to River Loop trail (PP1028)	Planned	Short	38,400	SCS
1.02	Playground upgrade (Barwon Terrace)	Planned	Short	-	SCS
1.03	Review and update Pathways Strategy	Planned	Short	45,000	SCS
1.04	Barwon River Trail West Hesse Street Bridge crossing (PP1048)	In-progress	Short	160,720	SCS
1.05	Barwon River Trail West Section 1 (PP1046, Part 1)	In-progress	Short	100,000	SCS
1.06	Barwon River Trail West inc. Bridge Crossing - Armytage St to Main Street (PP1027)	Planned	Med	101,000	SCS
1.07a	Barwon River Trail East Willis St Bridge to Hesse St (PP1035 Section 1)	Planned	Long	500,000	SCS
1.07b	Barwon River Trail East - Dickson's Road to Hesse St Bridge (PP1035 Section 2)	Potential	Long	120,000	SCS
1.08	Winchelsea Precinct Plan	In-progress	Short	20,000	SCS
1.09	Adventure Playground (new) at Barwon Terrace	Potential	Med	-	SCS
1.10	RV Park Landscape Plan	Planned	Short	10,000	SCS
1.11	Indigenous information and engagement	Potential	Med	20,000	SCS
1.12	Platypus educational signage	Potential	Med	2,500	SCS
1.13	Barwon River Trail West (PP1046 Section 2)	Planned	Med	110,000	SCS
1.13b	Barwon River Trail West (PP1046 Section 3)	Planned	Long	110,000	SCS
1.14	Barwon River Trail West - Richmond's Lane to Lauders Lane (PP1057)	Planned	Long	199,200	SCS
1.15	Barwon River Trail West Crossing Lauders Lane – Orchard Lane (PP1059)	Planned	Long	120,000	SCS
1.16	Barwon River Trail Crossing - Richmond's Lane - Batson Street (PP1060)	Planned	Long	120,000	SCS
1.17	Barwon River Trail West- Armytage Street to Cooper Street (PP1492)	Planned	Long	150,000	SCS
1.18	Barwon River Trail East- Napthine Reserve to Barwon Park Mansion (PP1233)	Planned	Long	423,270	SCS
A01	Armytage Street river access node	Potential	Med	See A01	SCS
H01	Hesse Street river access node	Potential	Short	See H01	SCS
L01	Lions Park river access node	Potential	Med	See L01	SCS



FIGURE 16 CWA PARK



FIGURE 17 HESSE ST ACCESS TO RIVER

Portfolio 2 Cooler, country streetscapes

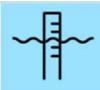
Overview

This portfolio addresses the key issue of hotter and drier streets across the township, a real threat which is likely to be exacerbated by climate change. This phenomenon, known as the ‘Urban Heat Island Effect’ is being experienced in cities and towns across the world due to the combined effect of increased absorption of heat in exposed concrete and road pavement, coupled with a decline in the canopy area of large shade trees. With its wide, exposed streetscapes and lack of tree canopy cover, Winchelsea is particularly at risk.

The idea involves establishing a ‘cooler streetscape’ trial, where a combination of measures would be installed to address the underlying causes of a warmer streetscape. These include retaining grass swales and planting site suitable canopy cover trees on the road side-slope of these swales. These trees would benefit from passive watering from the road, enabled by a roadside curb and channel punctuated by cut-aways to allow for water inflows during storm events. House downpipes would also be directed to the swales. Property access would be via concrete crossovers to avoid flow related issues associated with culverts.

The Bennett Street Avenue of Honour, which leads from the highway to Eastern Reserve has been chosen as a potential trial site due to its high profile as a place of remembrance and proposed streetscape upgrade works planned by council to address local drainage concerns. However, if this street is deemed unsuitable for such works then the proposed streetscape layout plan could be transferred to another street or streets.

Expected IWM benefits

		
3.2 Prevent likelihood of contamination via runoff 3.3 Meets best practice water quality requirements 3.5 Establish and preserve overland flow paths	5.2 Improved connectivity and access to green and blue spaces 5.3 Urban landscapes retain moisture for cooler, greener cities and towns	6.2 Local water related risks and issues understood and managed

Opportunities

Ref	Feature	Status	Indicative Timeframe	Cost	Lead
2.01	Design process	In-progress	Short	10,000	SCS
2.02	Walking path	Potential	Short	30,000	SCS
2.03	Commemorative information	Potential	Short	6,000	SCS
2.04	Direct residential stormwater to swales	Potential	Short	7,500	SCS
2.05	Large trees away from powerlines	Potential	Short	7,700	SCS
2.06	SM2 Kerb with cut-aways	Potential	Short	25,800	SCS
2.07	Cross-overs	Potential	Short	37,500	SCS
2.08	Recycled water	Potential	Long	48,400	SCS



FIGURE 18 GRASSED SWALES, SHADE TREES BARKLY ST

FIGURE 19 EXTENSIVE PAVEMENT, NO TREES HESSE ST

Portfolio 3 Smarter stormwater, greener golf

Overview

The Winchelsea Golf Course is a 9 hole course run entirely by volunteers. It has 120 members from the local community and is an important community open space asset which is accessible to the public, both for Golf and for non-golfing activities, such as dog walking (it is designated as a D2 off-leash area). The club's mission is to continually improve the course for members and the community alike and in the past decade it has invested in significant turf drainage and irrigation improvements.

It is now the major user of recycled water in the town and also uses locally captured stormwater when available. The source of this stormwater is from the catchment west of Anderson Street (the Deans Marsh-Winchelsea Road). Over the past five years this catchment has changed from dryland agriculture to urban development and a large service station with extensive paved areas has been developed at the highway intersection. The golf course state that additional stormwater is exacerbating existing problems from excess water and flooding at the Golf Course, as the existing drain is in poor condition and is choked by exotic woody weeds. They advise increased frequency of flooding is impacting on the vehicular access to the carpark clubrooms and the quality of the several of the fairways as well as causing erosion where the drain enters the river.

This portfolio proposes a cost-effective WSUD based solution of a wetland, swale and pond on the existing unused fairway immediately upstream of the existing dam. With shallow margins and gentle slopes, the system would intercept most of the floodwater that currently spills out uncontrolled across the course, whilst providing an opportunity harvest and treat the water, improving security and enhancing the biodiversity and amenity of the area. The system would be connected by a natural spillway to the existing drain to increase carrying capacity during serious flood events.

Surface drainage in this area to reduce these impacts whilst at the same time improving the quality and increasing the quantity of stormwater that can be harvested and reused by the course, at the same time reducing the impact on the Barwon River. Key features include upgrade and enhancement of the existing drain from the road to the major constriction points at the entrance road (potentially a high capacity low level bridge), improvements to the high flow offtake servicing the existing reuse scheme and construction of a new bio filtration treatment wetland and new storage dam upstream of the existing dam. It also includes building a new tank (approx. 250KL, doubling existing storage) to provide water security over the driest periods.

Complimentary works are proposed to improve the ecological and hydrological functionality of the existing drain along Dwyer Street, with a new adjoining walking path along the creek linking the new development with the proposed Barwon River Trail. Addressing erosion and improving access to the junction of the drain and the river will help manage fire risk.

The portfolio offers a chance to address legacy drainage issues in a way which offers significant public and private benefits including improved biodiversity habitat, improved overall landscape character of the course and creek, creating an attractive 'parkland environment' for walkers and golfers alike and improved playability and golfing experience.

Expected benefits

1.1 A diverse range of water supplies and resources 1.4 Secure and diverse water supplies for recreation and economy	3.3 Meets best practice water quality requirements 3.4 Location and use of retention systems to support re-use initiatives	4.1 Improved river health and understanding	5.4 Waterways accessible as valuable open space	6.3 Effectively engaging communities to better understand cultural and community values	7.1 IWM enables jobs and economic growth

Opportunities

Reference	Opportunity	Status	Indicative Timeframe	Cost	Agency
3.01	Drainage and flood review	Potential	Short	30,000	SCS
3.02	Enhance upstream detention basin	Potential	Short	10,000	WGC
3.03	Improve flood and stormwater offtake	Potential	Short	15,000	WGC
3.04	Improve course access and carpark	Potential	Short	70,000	WGC
3.05	New storage tank	Potential	Short	20,000	WGC
3.06	Stormwater treatment wetland	Potential	Short	100,000	WGC
3.07	In line swale to wetland and pond	Potential	Short	10,000	WGC
3.08	New storage pond	Potential	Med	50,000	WGC
3.09	Restoration of existing drain	Potential	Med	25,000	SCS
3.10	Wayfinding and education	Potential	Long	1,000	SCS
3.11	Drainage line erosion control	Potential	Med	20,000	SCS
3.12	Extend Dwyer St pathway	Potential	Long	10,000	SCS
4.03	Supply Class B Recycled Water through existing infrastructure	Potential	Short	See Port 4	BW



FIGURE 20 GOLF COURSE ACCESS ROAD AND DRAIN



(FIGURE 21) CARPARK AND FAIRWAY

Portfolio 4 Recycled water for greener, healthy spaces

Overview

This portfolio recognises the value of water for a greener, healthier Winchelsea and proposes establishment of a recycled water scheme for the town. The stakeholder preference was to explore the potential of this scheme to include an upgrade to Class B quality water with progressive staging based on priorities, resources and demand. It is understood that this would include approval from relevant departments, including Health and the EPA. Note that the scheme could still proceed in extent with Class C water, subject to agreement and approval from all relevant authorities.

Stage 1 involves a commitment to investigate the potential to upgrade the plant to Class B and make a proportion of water allocation available for the town's purposes, protecting this supply over the long term. In investigating the potential to go to Class B, Barwon Water would need to consider whether the water incurred an additional cost per ML. Given that costs of potable are currently considered prohibitive for many sites, this would require a discussion between Barwon Water and key users in the proposed scheme.

Priority areas for irrigation include Hesse Street Reserve, Lions and CWA Parks and the western gateway. Stage 2 would include the potential Winchelsea Arboretum (along the trail around the WRP), the Eastern gateway and the river surrounds in the high use zone on the east bank. Stage 3 would service the new oval at Eastern Reserve, Barwon Park Mansion and other open space nodes in new growth areas. In total, the Scheme could replace up to 30M/year of drinking water with Class B water. At current prices, this is almost \$70,000 per year of water.

Expected benefits

			
1.4 Secure and diverse water supplies for industry, agriculture, health, culture, recreation and economy 1.5 Water available to maintain valued green community assets	2.1 Meets public health and environmental standards 2.2. Effective and affordable sewerage systems 2.3 Waste-to-resource opportunities are maximised including recycled water and energy	5.1 Active and passive recreation supported by water	7.1 IWM enables jobs and economic growth 7.2 Ensuring security and diversity of supply to enable economic growth

POTENTIAL SITES FOR RECYCLED WATER USE



FIGURE 22 CWA PARK, WEST BANK OF RIVER



FIGURE 23 HESSE ST RESERVE

Opportunities

Ref	Opportunity	Status	Indicative Timeframe	Cost Estimate	Agency
4.01	Class B Upgrade at Winchelsea WTP	Potential	Short	120,000	BW
4.02	Class B Recycled water to Eastern Reserve Oval 1	Potential	Short	N/A	SCS
4.03	Class B Recycled water to Golf Club	Potential	Short	N/A	WGC
4.01A	Stage 1 Rising Main	Potential	Short	316,000	BW
4.01B	Stage 2 Rising Main	Potential	Med	844,000	BW
4.01C	Stage 3 Rising Main	Potential	Long	290,000	BW
4.04	Hesse St Reserve irrigation and landscaping	Planned	Short	172,000	SCS
4.05	Barwon River surrounds – CWA Park irrigation	Potential	Short	11,280	SCS
4.06	Barwon River surrounds – Lions Park irrigation	Potential	Short	11,280	SCS
4.07	Princes Hwy Gateway West irrigation	Potential	Short	11,280	SCS
4.08	Pilot streetscape cooling (Bennett Street) recycled water supply for irrigation	Potential	Med	10,000	SCS
4.09	Barwon River surrounds - East bank, below Playground, irrigation	Potential	Med	11,280	SCS
4.10	Princes Hwy Gateway East irrigation	Potential	Med	22,560	SCS
4.11	Northern Trail/ Arboretum irrigation	Potential	Long	10,152	SCS
4.12	Eastern Reserve surrounds irrigation	Planned	Long	N/A	SCS
4.13	Eastern Reserve Oval 2 irrigation	Planned	Long	92,240	SCS
4.14	Deans Marsh Rd new Public Open Space irrigation	Potential	Long	N/A	SCS
4.15	Barwon Park Mansion irrigation	Potential	Long	54,144	NTV

POTENTIAL SITES FOR RECYCLED WATER USE



FIGURE 24 PRINCES HWY GATEWAYS (WEST)



FIGURE 25 SUSSEX ST TRAIL – A NEW ARBORETUM?



FIGURE 26 BARWON PARK PARTERRE GARDEN



FIGURE 27 MAIN ST MEDIAN

Portfolio 5 Greening, growing Barwon Park

Overview

This portfolio presents an innovative opportunity to reactivate the National Trust (Victoria) property Barwon Park, which is on the northern outskirts of the town boundary, close to the Water Reclamation Plant. This property, built in the 1870's is one of the most important historical country homes in regional Victoria.

The concept involves as a priority, connecting the site to the potable water supply, which would greatly improve firefighting safety and on-site amenities. It also includes reactivating the site through the extensive use of recycled water from the nearby treatment plant. The water would be used extensively in the mansion's surrounds, gardens and landscaping (which are presently not irrigated), vastly improving the visitor experience. Note that if the Class B upgrade was not feasible, some of the proposed initiatives could use Class C water.

These landscape improvements would be complimented by creating direct pathway links back to the township, both along the river corridor and via Trebeck Court and the potential Winchelsea Arboretum Trail around the Water Reclamation Plant. A purpose-built Mansion Circuit Walk would be created, providing an easy stroll for visitors to view key features such as the gardens, old stables, site of original homestead, river frontage, orchard and a newly established treed boulevard along the southern boundary to link back to the Barwon River trail. The existing ephemeral wetland along the northern boundary would be rehabilitated and revegetated, providing habitat for biodiversity and offering a bird hide for visitors.

The Trust is also interested in exploring new and innovative commercial and value generating initiatives. Opportunities which have been suggested include re-establishing the Heritage Orchard which once occupied part of the site and developing a commercial and retail cidery and café in the historic stables. This could be combined with an al-fresco dining area and pick-your-own berries and fruit.

It also may be possible to utilise some of the dryland farming areas surrounding the property to develop a community supported agriculture venture on the site. This could also provide jobs for local people, working on producing high quality food for local people from one of the state's most iconic Trust properties, taking advantage of the burgeoning interest in niche local goods along the Otway Harvest Trail. Similarly, the site could be used to trial and raise awareness of traditional aboriginal horticultural practices one common throughout the western area of Victoria.

Expected benefits

					
1.4 Secure and diverse water supplies for industry, agriculture, health, culture, recreation and economy 1.5 Water available to maintain valued green community assets	2.2. Effective and affordable sewerage systems 2.3 Waste-to-resource opportunities are maximised including recycled water and energy	4.1 Improved river health and understanding	5.2 Improved connectivity and access to green and blue spaces 5.4 Waterways accessible as valuable open space	6.1 Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied 6.3 Effectively engaging communities to better understand cultural and community values	7.1 IWM enables jobs and economic growth 7.2 Ensuring security and diversity of supply to enable economic growth 7.3 Leveraging knowledge and resources to support innovative, collaborative outcomes

Opportunities

Note that costs of opportunities for this portfolio are site specific and require a more detailed business plan to be developed properly with NTV.

Ref	Opportunity	Status	Ind. Timeframe	Cost Est.	Agency
4.01C	Stage 3 Rising Main	Potential	Long	290,000	BW
5.01	Landscaping along driveway and irrigated	Potential	Short		NTV
5.02	Parterre garden revitalised and irrigated	Planned	Short		NTV
5.03	Mansion grounds garden revitalised and irrigated	Potential	Short		NTV
5.04	New mains water supply via road	Planned	Short	20,000	NTV
5.05	Heritage Orchard Stage 1	Planned	Short	5,000	NTV
5.06	Restore plumbing in main buildings	Planned	Short		NTV
5.07	Site Master Plan developed	Planned	Short		NTV
5.08	Firefighting system upgrade	Planned	Short	20,000	NTV
5.09	Local aboriginal horticulture practice trial	Potential	Med		NTV
5.10	Pathway to Arboretum Walk via Inverleigh Winchelsea Road	Potential	Med		NTV
5.11	Pathway link to town via river	Potential	Med		NTV
5.12	Site activation options socio-economic benefit study	Planned	Med		NTV
5.13	Interactive educational display for guided and self-guided tours	Potential	Med		NTV
5.14	Pathway link to river via south west boundary	Planned	Med		NTV
5.15	Avenue of trees irrigated along link to river	Potential	Med		NTV
5.16	Heritage Orchard (Stage 2)	Potential	Med	5,000	NTV
5.17	Community garden	Potential	Med		NTV
5.18	Wetlands birdwatching area	Potential	Med		NTV
5.19	Cidery and café	Potential	Med		NTV
5.20	Pick-your-own berry patch	Potential	Med		NTV
5.21	Alfresco dining area	Potential	Med		NTV
5.22	Heritage Orchard Stage 3	Potential	Long	5,000	NTV
5.23	All-accessibility walking circuit	Potential	Long		NTV
5.24	Annual program of site-based activities	Potential	Long		NTV
5.25	Interpretive information at site of original house	Potential	Long		NTV
5.26	Community supported agriculture venture	Potential	Long		NTV
5.27	Native revegetation to create wildlife corridor	Potential	Long		NTV
5.28	Agricultural leased area	Existing	Short		NTV



FIGURE 28 BARWON PARK MANSION



FIGURE 29 BARWON PARK STABLES

Concept Plan L01 - Lions Park river access node

Overview

Lions Park at the eastern end of the main street shopping centre is a key node for access to the river and where WSUD features could enhance the aesthetic appeal of the area to the local community and travelers.

A major underground drain servicing much of the western side of the highway to the west discharges at the river at this site adjacent to the old bridge. This outlet sometimes fails to cope with high rain events and distributes sometimes poor water quality into the river pool at the bridge. Shire installed a release pit to alleviate blockages and erosion at the discharge point into the river, but no treatment occurs at this site. Some erosion is occurring at the riverbank discharge point.

The grassed area in the Park is a popular stop for travelers heading west and is also flanked by the outdoor area of the Barwon Hotel. However, the area is not well activated with limited landscaping, no irrigation and just a few timber tables. There is no formal link from the town centre to the river trail and wayfinding is limited. The large elm trees adjacent to the old bridge are showing signs of stress. Note that given its proximity to the Barwon River, the site might have specific requirements for irrigation with recycled water, Class C or Class B (Rhys Bennett, Barwon Water, pers. comm).

This concept involves daylighting the existing drain below the toilet block and developing an inviting water-based landscape whilst at the same time improving water quality and general amenity of the area.

Revegetation and landscaping works would complement wayfinding and educational information to provide a focal point for the planned Barwon River Loop Trail.

Expected IWM benefits

				
3.2 Prevent the likelihood of contamination via runoff 3.3 Meets best practice water quality requirements	4.1 Improved river health and understanding	5.2 Improved connectivity and access to green and blue spaces 5.4 Waterways accessible as valuable open space	6.1 Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied 6.3 Effectively engaging communities to better understand cultural and community values	7.1 IWM enables jobs and economic growth

Opportunities

Ref	Design Feature	Indicative Timeframe	Cost Estimate	Agency
L02	Improve access under bridge to CWA Park	Short	25,000	SCS
L03	Dense planting on embankment irrigated with alternative water	Med	5,000	SCS
L04	Ephemeral stormwater cascades with informal crossing points. 10m wide, 2m deep	Med	30,000	SCS
L05	Wayfinding signage and cultural, ecological information	Short	2,000	SCS
L06	Remove/ reduce width of existing access track	Short	2,000	SCS
L07	Minimise impact to existing trees from stormwater daylighting	Med	1,000	SCS
L08	Daylight drain creating ephemeral cascading outlet	Med	40,000	SCS
L09	Increased greening, recycled water used to irrigate park	Med	See Port 4	SCS
L10	Improve park interface with Barwon Hotel	Short	5,000	SCS
L11	Utilise existing embankment for informal seating	Short	5,000	SCS
L12	Access point to Barwon River limited to cyclist, pedestrians and maintenance crews	Short	5,000	SCS
L13	Encourage access from commercial precinct with entry statement to Barwon River Trail	Short	2,000	SCS
L14	Install Gross Pollutant Trap at end of main stormwater outlet to reduce litter into river	Long	30,000	SCS

Concept Plan A01 - Armytage Street river access node

Overview

The eastern end of Armytage Street is a key node for access down to the Barwon River where stormwater related issues can be simultaneously managed to be complementary to improving access to the existing walking path and pedestrian low-level crossover of the river.

Armytage Street carries a major underground drain that services much of the north eastern segment of the township, including water from the Princes Highway western gateway. At the same time, stormwater from the length of the road makes its way down to the river in two surface drains, only one of which is concrete lined. Erosion is occurring at the riverbank discharge points of both drains and undermining mature River Redgums.

The major outlet is degrading due to high flows and velocities. There is no ability to reduce the flow velocity or treat the stormwater at this site, so erosion protection works need to be upgraded and maintained. They could however, be made more aesthetic and less intrusive through complimentary native plantings. Also, the two existing surface drains could be redirected into one and have remedial WSUD features and landscaping prior to discharge. The Shire has discussed upgrade the low-level cross-over and the pathway in both directions but these works are not currently budgeted.

Council has designated the area bounded by the Princes Highway, Hesse Street, Armytage Street and Murrell Street as a “Health and Education Precinct”. This designation recognises the importance of this area to accommodate future health and education services including aged care, residential housing and other community facilities (Surf Coast Shire, 2015). Armytage Street is already a major access and destination node for many of the older people in this area (Jen McLean, pers. comm). The concept provides a comprehensive river access activation node including dealing with major stormwater issues, improving access, providing wayfinding and educational information and raising awareness of aboriginal cultural values of the river.

Expected IWM benefits

			
3.2 Prevent the likelihood of contamination via runoff 3.3 Meets best practice water quality requirements	4.1 Improved river health and understanding	5.2 Improved connectivity and access to green and blue spaces 5.4 Waterways accessible as valuable open space	6.1 Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied 6.3 Effectively engaging communities to better understand cultural and community values

Opportunities

Ref	Design Feature	Indicative Timeframe	Cost Est.	Agency
A02	Formalise access to Barwon River Trail	Med	10,000	SCS
A03	Simple Entry Statement to signify access point to Barwon River	Med	2,000	SCS
A04	Improved landscape leading to river access	Med	10,000	SCS
A05	Maintenance required to existing outfall structure	Med	5,000	SCS
A06	Modifications to existing drainage to eliminate erosion issues	Med	15,000	SCS
A07	Wayfinding signage and cultural information	Med	2,000	SCS
A08	Improve low level access across River	Med	20,000	SCS
1.06	Formalised access to CWA & Lions Park	Med	10,000	SCS
1.09	Improved amenities and functionality within RV Park through Landscape Plan	Med	30,000	SCS
1.17	Extend Barwon River Trail to Napthine Reserve	Long	100,000	SCS

Concept Plan H01 - Hesse St river access node

Overview

The southern end of Hesse Street where it links with the Barwon River is a key pedestrian access node. It also presents significant stormwater related issues, which can be managed to be complementary to access improvements to the proposed pedestrian bridge.

The section from the end of the paved area of Hesse Street drops down steeply to the river, so all-ability access is currently not possible. At the same time, stormwater from the road makes its way down to the river in two surface drains, only one of which is concrete lined. Erosion is occurring at the river discharge points of both drains due to the high velocity of water during storm events. There is no ability to reduce the flow velocity or treat the stormwater before it enters the river.

The Shire is designing and about to install a pedestrian bridge at this site and is also negotiating with adjoining landowners (who have absolute river frontage) to formalise the existing pathway on the east bank from this location downstream to Lions Park.

This concept plan proposes installation of an all-abilities access track to the river down from the end of Hesse Street, combined with Water sensitive urban Design features to manage and treat stormwater. The concept involves a zig-zag pathway with acceptable grade change contained by retaining walls across the slope face and incorporating a cascading stormwater determine and treatment train with extensive native landscaping.

Expected benefits

				
3.2 Prevent the likelihood of contamination via runoff 3.3 Meets best practice water quality requirements	4.1 Improved river health and understanding	5.2 Improved connectivity and access to green and blue spaces 5.4 Waterways accessible as valuable open space	6.1 Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied 6.3 Effectively engaging communities to better understand cultural and community values	7.1 IWM enables jobs and economic growth

Opportunities

Ref	Design Feature	Indicative Timeframe	Cost Estimate	Agency
H02	Direct existing drainage into WSUD features	Med	15,000	SCS
H03	Simple Entry Statement to signify access point to Barwon River	Med	2,000	SCS
H04	All abilities access point to Barwon River	Med	25,000	SCS
H05	Grade change using low height retaining walls, incorporating water feature	Med	20,000	SCS
H06	Cascading Raingarden/Feature	Med	20,000	SCS
H07	Wayfinding signage and cultural information	Med	2,000	SCS
1.04	Future Barwon River pathway	Med	Port 1	SCS
1.04	Proposed low level bridge crossing of Barwon River	Med	Port 1	SCS

References

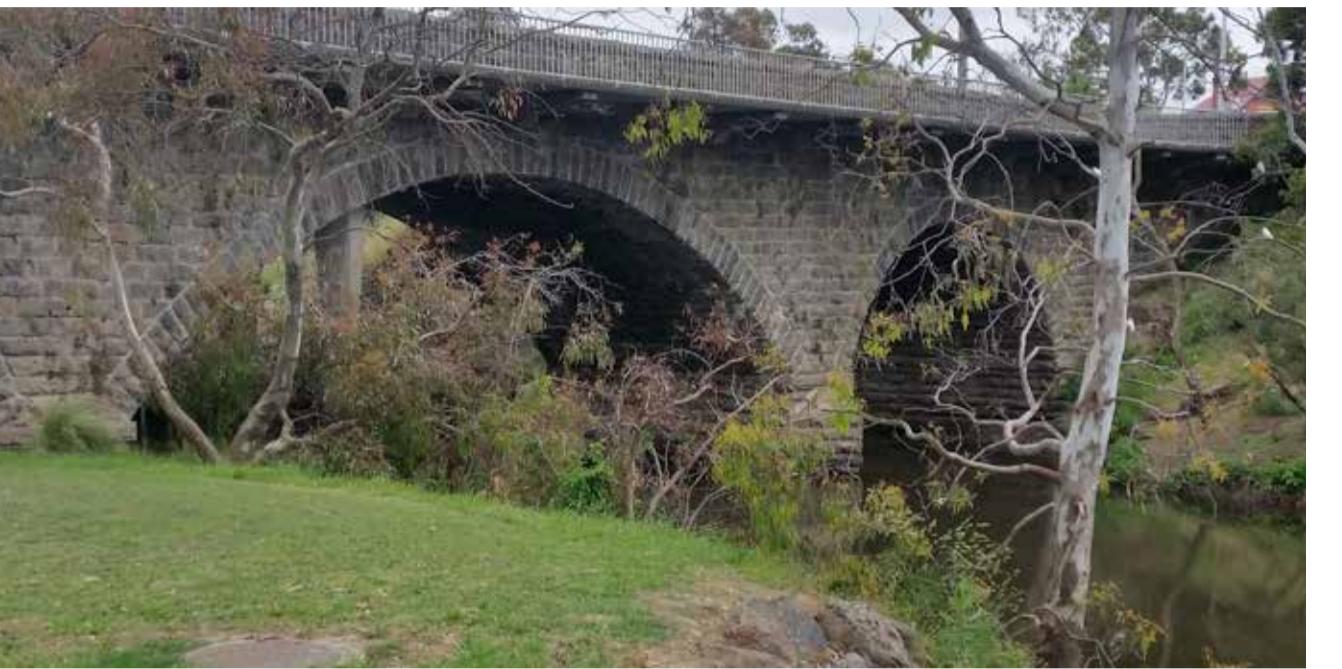
- Barwon Water (2017) Urban Water Strategy
- DELWP (2017) Integrated Water Management Framework for Victoria: An IWM approach to urban water planning and shared decision making throughout Victoria
- DELWP (2018) Barwon Region IWM Forum, Strategic Directions Statement
- DELWP Third assessment of Index of Stream Condition
- Corangamite CMA Waterway Health Strategy
- G21 (2014) Regional Growth Plan and Background Report
- Surf Coast Shire (2012) Pathways Strategy: Connecting Communities
- Surf Coast Shire (2015) Growing Winchelsea Plan
- Surf Coast Shire (2016a) SCS Open Space Strategy
- Surf Coast Shire (2016b) Growing Winchelsea Prospectus for new residents
- Surf Coast Shire Winchelsea Town Centre Access and parking report
- Surf Coast Shire (undated) Barwon Pathway Loop Plan

Appendices

- Appendix 1 Portfolio 1 Enhancing the Barwon River
- Appendix 2 Portfolio 2 Cooler country streetscapes
- Appendix 3 Portfolio 3 Smarter stormwater, greener golf
- Appendix 4 Portfolio 4 Recycled water for greener, healthy spaces
- Appendix 5 Portfolio 5 Greening, growing Barwon Park
- Appendix 6 Concept Plan L01 Lions Park river access node
- Appendix 7 Concept Plan A01 Armytage St river access node
- Appendix 8 Concept Plan H01 Hesse St river access node
- Appendix 9 List of Stakeholders
- Appendix 10 Barwon IWM Forum Outcomes & Goals Framework



Aboriginal cultural signage (Bunyip Trail, Adelaide)



Winchelsea historic bridge



Low-level pedestrian river crossing



Adventure playgrounds connect kids with nature

Legend

- River Corridor
- Existing Pathways
- Short Term Project (<2 years)
- Medium Term Project (3-5 years)
- Long Term Project (>5 years)

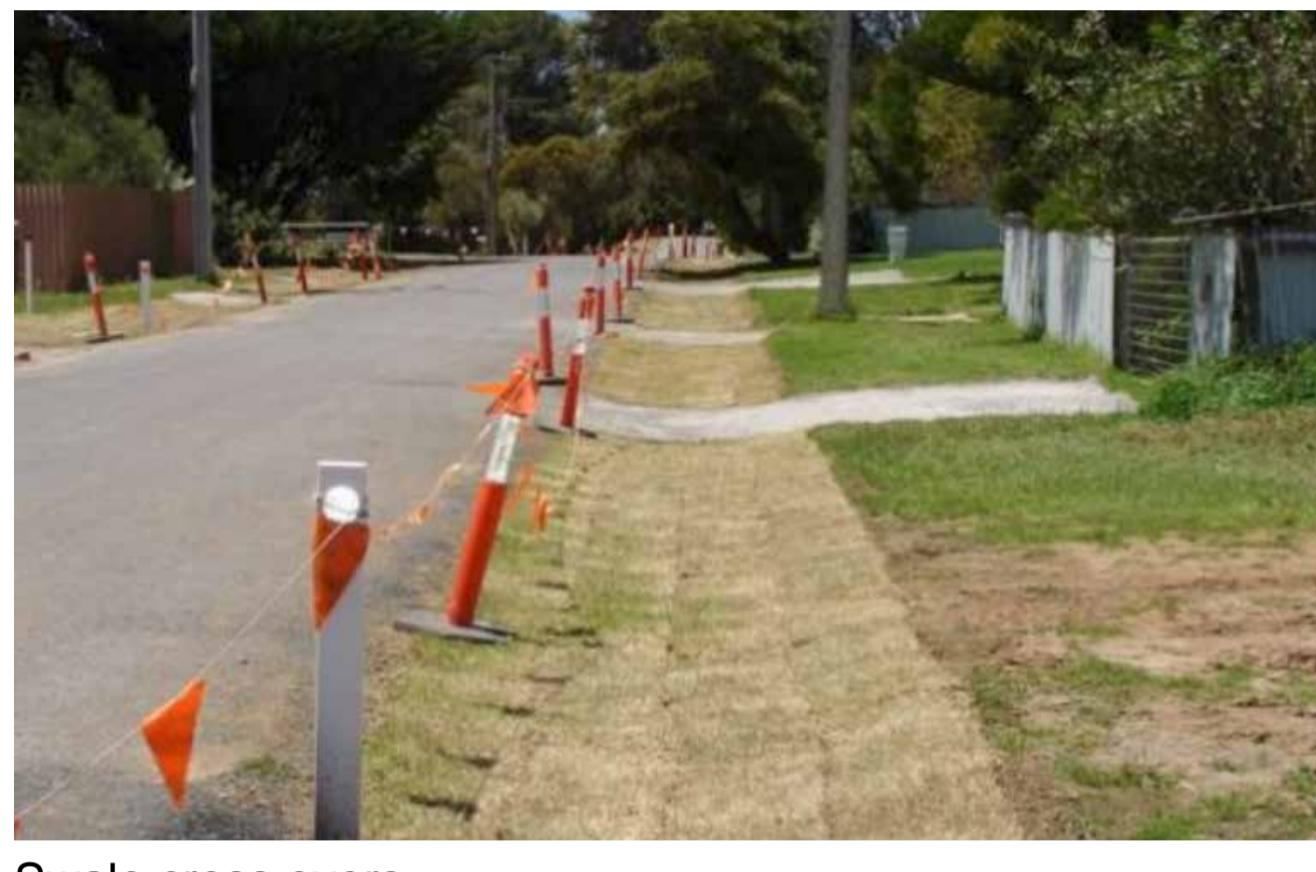
Note: Refer projects table for details



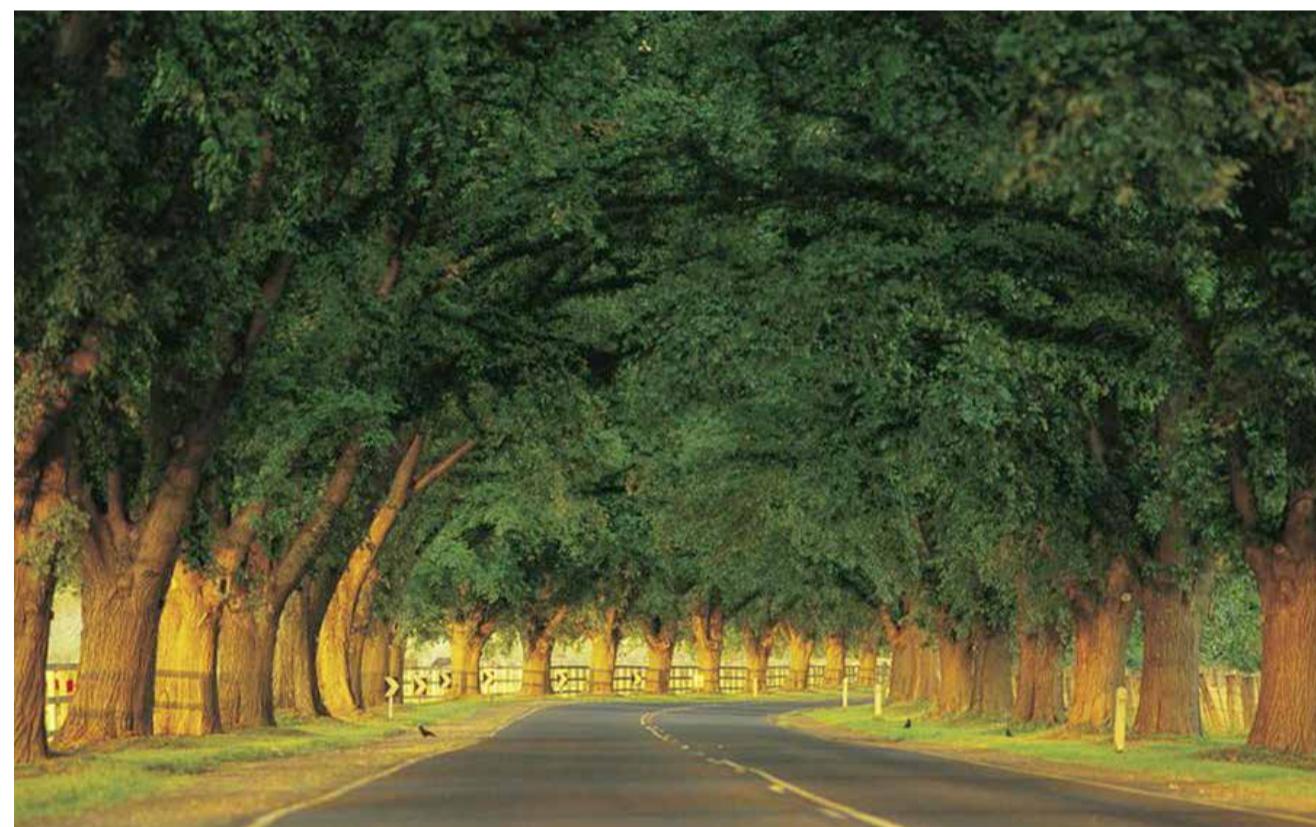
PP No Refers to SCS Pathway Strategy (2012) Project Number



Kerb cut aways at proposed tree locations to enable passive irrigation



Swale cross overs



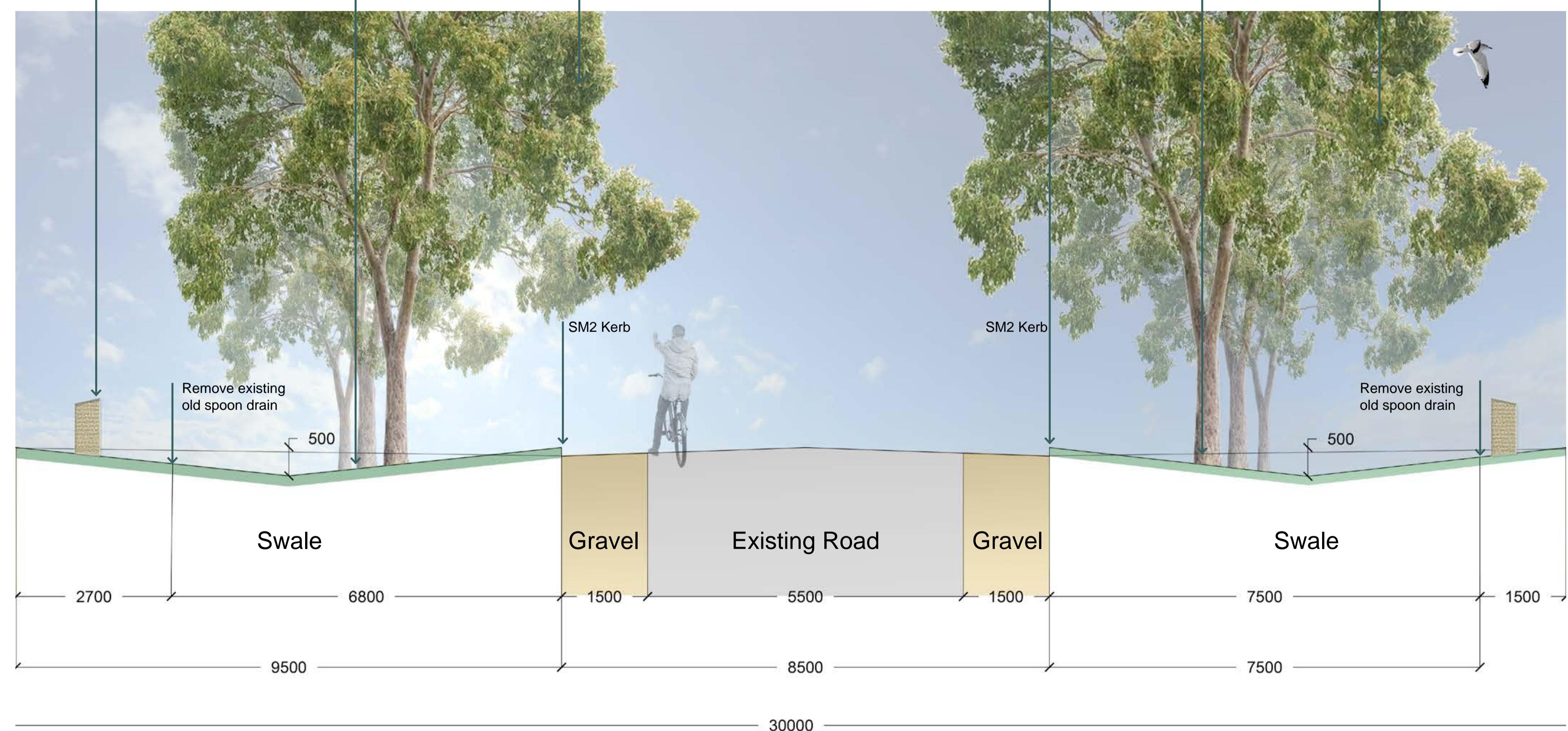
Example Tree Lined Avenue of Honour (Woodend VIC)



Memorial signage and commemorative features

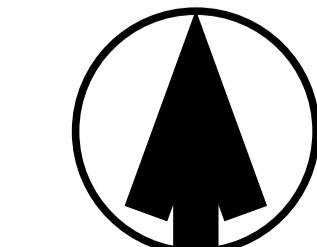


- 2.02 1.5m wide concrete footpath
- 2.03 Use of war memorial signage/commemorative features (with RSL input)
- 2.04 House downpipes connected directly to swales to improve local stormwater treatment
- 2.08 Potential connection to recycled water for supplementary irrigation of trees
- 2.06 Use of SM2 Kerbs with regular cut aways to allow passive irrigation to proposed trees
- 2.07 Concrete cross overs, traverse swale as driveways
- 2.05 Replanting of avenue of honour trees



Winchelsea IWM Plan Concept 2

Cooler Country Streets





- 3.01 Investigate drainage and flooding issues from Anderson Road to river
 - 3.02 Enhance upstream detention basin
 - 3.03 Improve flood/ stormwater oftake / capacity
 - 3.04 Improve course access & car park
 - 3.05 New storage tank
 - 3.06 Stormwater treatment wetland
 - 3.07 Swale to wetland and pond
 - 3.08 New storage pond
 - 3.09 Restore existing drain
 - 3.10 Wayfinding signage and education
 - 3.11 Drainage line erosion control at river
 - 3.12 Extend Dwyer St pathway



Winchelsea IWM Plan

Concept 3 Smarter stormwater, greener golf



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River woodland trail



Landscaped, irrigated buffer between highway and retail



Eastern Reserve



Casual seating on irrigated riverbank

Legend

- River Corridor
- Existing Pipeline
- Stage 1
- Stage 2
- Stage 3

Note: Refer projects table for details

- 4.15 Barwon Park Mansion irrigation
- 4.01C Stage 3 Rising Main

- 4.01 Class B Upgrade at Winchelsea WTP

- 4.11 Northern Trail/ Arboretum irrigation

- 4.01B Stage 2 Rising Main

- 4.10 Princes Hwy Gateway East irrigation

- 4.08 Pilot streetscape greening (Bennett Street) irrigation

- 4.02 Class B Recycled water to Eastern Reserve Oval 1

- 4.09 Barwon River surrounds - East bank, below Playground, irrigation

- 4.12 Eastern Reserve surrounds irrigation

- 4.04 Hesse St Reserve irrigation and landscaping

- 4.05 Barwon River surrounds - CWA Park irrigation

- 4.01A Stage 1 Rising Main

- 4.07 Princes Hwy Gateway West irrigation

- 4.14 Deans Marsh Rd new Public Open Space irrigation

- 4.03 Class B Recycled water to Golf Club

- 4.06 Barwon River surrounds - Lions Park irrigation

- 4.13 Eastern Reserve Oval 2 irrigation





Café and outdoor area at old stables



Bird hide at natural wetland



Pathway through apple orchards

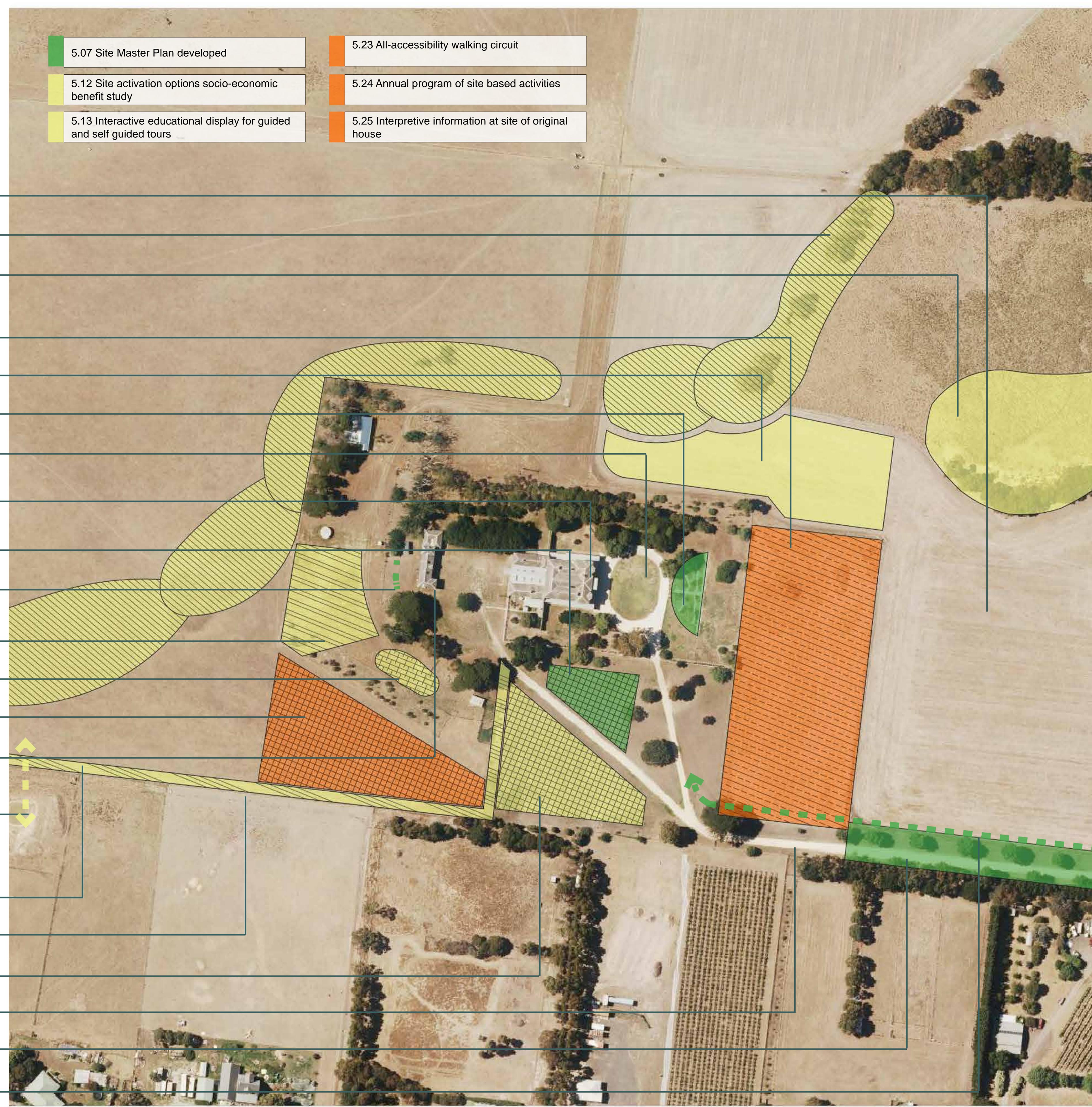


Landscaped native gardens

Legend

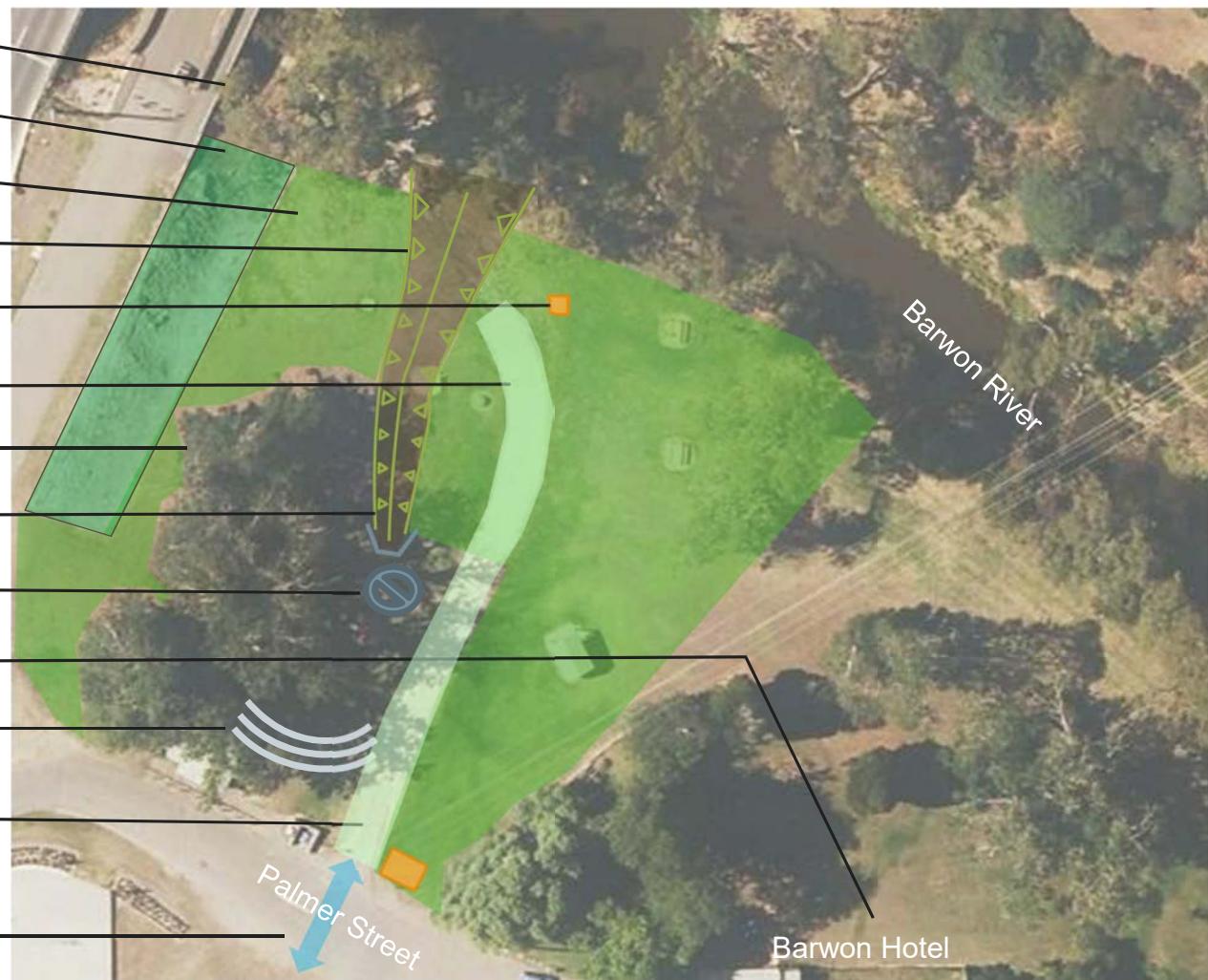
- Short Term Project (<2 years)
- Medium Term Project (3-5 years)
- Long Term Project (>5 years)

Note: Refer projects table for details





- L02 Improve access under bridge to CWA Park
- L03 Dense planting on embankment irrigated with alternative water
- L09 Increased greening, recycled water used to irrigate park
- L04 Ephemeral stormwater cascades with informal crossing points
- L05 Wayfinding signage and cultural, ecological information
- L06 Remove/ reduce width of existing access track
- L07 Minimise impact to existing trees from stormwater daylighting
- L08 Daylight drain creating ephemeral cascading outlet
- L14 Install GPT at stormwater outlet to reduce litter into river
- L10 Improve park interface with Barwon Hotel
- L11 Utilise existing embankment for informal seating
- L12 Access point to Barwon River limited to cyclist, pedestrians and maintenance crews
- L13 Encourage access from commercial precinct with entry statement to Barwon River Trail



Winchelsea IWM Plan Concept Plan L01 Lions Park river access node



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1.17 Extend Barwon River Trail to Napthine Reserve

A02 Formalise access to Barwon River Trail

A03 Simple Entry Statement to signify access point to Barwon River

A04 Improved landscape leading to river access

A05 Maintenance required to existing outfall structure

A06 Modifications to existing drainage to eliminate erosion issues

A07 Wayfinding signage and cultural information

A08 Improve low level access across River

1.06 Formalised access to CWA & Lions Park



Winchelsea IWM Plan Concept Plan A01 Armytage St river access node



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Appendix 9 List of Stakeholders

Name	Role	Organisation	Workshop				Other
			1	2	3	4	
Anne Howard	Gen. Mgr Governance and Infrastructure	Surf Coast Shire				Y	
Chloe Godau	Health and Wellbeing Officer	Surf Coast Shire		Y			
David Stacey	Coordinator Infrastructure Development	Surf Coast Shire	Y			Y	
David Mitchell	Project Engineer	Surf Coast Shire		Y		Y	
Damien D'Aspromonte	Consultant	Foresight Advisory				Y	
Elliot Stuart	IWM Coordinator, West	DELWP	Y				
Gabrielle O'Shea	Biodiversity	Surf Coast Shire			Y		
Geoff Taylor	Corangamite CMA	Corangamite CMA				Y	
Greg Rigby	President	Winchelsea Golf Club					
Heather Forsyth	Senior Regional Planner	DELWP		Y			
Ian Stewart	Manager, Engineering services	Surf Coast Shire	Y		Y	Y	
Jarrod Westward	Coordinator Recreation Planning	Surf Coast Shire	Y		Y		Y
Jason Eales	Coordinator Open Space Operations	Surf Coast Shire		Y	Y		Y
Jen McLean	Health Promotion Officer	Hesse Rural Health		Y		Y	
Jessica Bennett	Coordinator Open Space Planning	Surf Coast Shire			Y		
John Aldridge	Strategic Asset Manager	Surf Coast Shire			Y		
John Furleo	Project Design Engineer	Surf Coast Shire	Y			Y	
John Bertoldi	Manager, Strategic Asset Management	Surf Coast Shire				Y	
Kate Smallwood	Coordinator Environment	Surf Coast Shire				Y	
Leanne Roffe		Surf Coast Shire	Y				
Lachie Mclean		Surf Coast Shire		Y			
Mark Gibbons	Coordinator Design & Traffic	Surf Coast Shire	Y	Y			
Melinda Kennedy	Tradition Owner	Wadawurrung					Y
Michael Tucker	Member	Growing Winchelsea Inc.	Y	Y		Y	
Paul Elshaug	Recreation Development Officer	Surf Coast Shire					Y
Paul Davis	CEO	Wathaurung Aboriginal Corporation					Y
Richard Bain	Special Projects Coordinator	Surf Coast Shire			Y	Y	
Sally Conway	Principal Strategic Planner	Surf Coast Shire		Y		Y	
Samantha Natt	Principal Strategic Planner	Surf Coast Shire		Y			
Sean Keown	Project Design Engineer	Surf Coast Shire		Y	Y	Y	Y
Sherredan Maher	Assets Manager	National Trust (Victoria)				Y	Y
Stewart Mathison	Secretary	Winchelsea Land & River Care	Y	Y			
Rhys Bennett	Network Asset Coordinator	Barwon Water	Y	Y	Y	Y	Y
Rowan McKenzie	Mgr, Enviro and Community Safety	Surf Coast Shire	Y			Y	
Scott Jardin	Economic Development Officer	Surf Coast Shire					
Will Welsh		DELWP	Y				

Appendix 10 Barwon IWM Forum Outcomes & Goals Framework

IWM Outcome	IWM Goal					
1. Safe, secure and affordable supplies in an uncertain future	1.1 A diverse range of water supplies and resources	1.2 Water quality meets regulatory standards and community expectations	1.3 Efficiently managed water and demand	1.4 Secure and diverse water supplies for industry, agriculture, health, culture, recreation and economy	1.5 Water available to maintain valued green community assets	1.6 Managing high quality groundwater for agricultural purposes
2. Effective and affordable wastewater systems	2.1 Meets public health and environmental standards	2.2. Effective and affordable sewerage systems	2.3 Waste-to-resource opportunities are maximised including recycled water and energy			
3. Avoided or minimised existing and future flood risks	3.1 Community and property resilience to local flood risk	3.2 Prevent the likelihood of contamination via runoff	3.3 Meets best practice water quality requirements	3.4 Location and use of retention systems to support re-use initiatives	3.5 Establish and preserve overland flow paths	3.6 Develop regional urban stormwater management policy and strategy
4. Healthy and valued waterways and marine environments	4.1 Waterway health is understood and improved	4.2 Marine environment health is understood and managed	4.3 Establish a clear position on roles and responsibilities for rural drainage and river management including water quality and security of supply	4.4 Groundwater dependent ecosystems are well managed		
5. Healthy and valued urban, agricultural, rural and green landscapes	5.1 Active and passive recreation supported by water	5.2 Improved connectivity and access to green and blue spaces	5.3 Urban landscapes retain moisture for cooler, greener cities and towns	5.4 Waterways and coastal environments accessible as valuable open space		
6. Traditional Owner and community values reflected in place-based planning	6.1 Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied	6.2 Local water related risks and issues understood and managed	6.3 Effectively engaging communities to better understand cultural and community values			
7. Jobs, economic growth and innovation	7.1 IWM enables jobs and economic growth	7.2 Ensuring security and diversity of supply to enable economic growth	7.3 Leveraging knowledge and resources to support innovative, collaborative outcomes			