BARWON INTEGRATED WATER MANAGEMENT FORUM

STRATEGIC DIRECTIONS STATEMENT

DRAFT FOR FORUM REVIEW AND ENDORSEMENT 17 JULY 2018

Document Control

Version	Date	Author	Reviewed by	Reviewed Date
Preliminary Draft V1	08/05/2018	Tony Overman		
Preliminary Draft V2	11/05/2018	Tony Overman	Nicole Sexton Elliot Stuart	18/05/2018
Draft 3	24/05/2018	Celeste Morgan		
Draft V4	25/05/2018	Nicole Sexton	Carol Boyle	28/05/2018
Draft V5	28-31/05/2018	Nicole Sexton	Carol Boyle	2/05/2018
Draft V6	4/6/2018	Nicole Sexton	Carol Boyle	5/06/2018
Draft V7	13/6/2018	Nicole Sexton	IWCM Network	13/6/2018
Draft V8	13/7/2018	Nicole Sexton	IWM Forum	13/7/2018

Contents

Chair's Foreword

To be completed

Acknowledgements

The Barwon region covers both Eastern Maar and Wadawurrung (Wathaurung) Country, whose ancestors and their descendants are the traditional custodians of this land. Eastern Maar lands extend as far north as Ararat and encompasses the Warrnambool, Port Fairy and Great Ocean Road areas. It also stretches 100m out to sea from low tide and therefore includes the iconic Twelve Apostles, while the traditional boundaries of the Wathaurong people span the coastline from the Werribee River to Lorne peninsula and traverse inland in a north westerly direction towards Ballarat.

The forum area is abundant in Aboriginal cultural sites with a majority of these found near waterways and the coast. The forum stakeholders acknowledge these Traditional Owners as traditional custodians who have managed land and water sustainably over thousands of generations, and maintain an active connection to Country.

This Strategic Directions Statement has been developed by the Barwon Integrated Water Management Forum, which includes the following organisations:

- Barwon Water Corporation
- Corangamite Catchment Management Authority
- City of Greater Geelong
- Colac Otway Shire
- Department of Environment, Land, Water and Planning (DELWP)
- Department of Health and Human Services
- Golden Plains Shire
- Southern Rural Water Corporation
- Surf Coast Shire
- Borough of Queenscliffe
- Wathaurung Aboriginal Corporation
- Eastern Marr

DRAFTING NOTE
Insert logos

Executive Summary

The Barwon IWM Region is located in regional Victoria, to the west and south west of the Melbourne metropolitan area. It is a region attracted by many people as a place to live, work and visit due to its amazing natural assets including expansive coast line and rainforests. With its close proximity to Melbourne it is a major player in the state economy through manufacturing, healthcare, education and tourism.

The Barwon Region is currently facing a number of challenges including population growth, climate change impacts, changing community needs and expectations and the continued need to support regional economic growth and development. The impact of these challenges on the water cycle is complex and interrelated. These impacts are varying and in some areas not well defined and include variations in availability of water in our catchments to support drinking water and water for the environment. Impacts resulting in increased volumes and reduced quality of runoff into our waterways and marine environments. Impact across the region in being able to provide sufficient green open space and natural assets to meet the long term health and wellbeing of our community. As our Region continues to grow and prosper, we need to be innovative to ensure water and wastewater services are accessible to a growing region and developing economy.

There are many stakeholders who have responsibilities in managing the varying aspects of the water cycle. Water management spans across multiple local and regional agencies. Working together to optimise and integrate our outcomes provides the best opportunity for efficient, effective and meaningful investment in water management, which also supports community outcomes, bolsters local economy and makes our region more green and liveable. This is known as Integrated Water Management (IWM).

This Strategic Directions Statement (SDS) is an agreement between the stakeholders also known as the Barwon IWM Forum. IWM is dynamic in nature and consequently it is envisaged that this SDS will be a living document which will be updated to reflect the Barwon Region's current priorities and opportunities.

The Barwon IWM Forum, has agreed to the following Vision and Strategic outcomes and is committed to collaborating and working effectively together to ensure we continue to deliver on this vision and outcomes.

Vision: *Integrated, collaborative management of the water cycle that enables sustainable environmental, social, cultural and community prosperity for the Barwon Region.*

Strategic outcomes:

1. Safe secure and affordable supplies in an uncertain future;
2. Effective and affordable wastewater systems;
3. Avoided or minimised existing and future flood risks;
4. Healthy and valued waterways and marine environments;
5. Healthy and valued urban, agricultural, rural and green landscapes;
6. Traditional owner and community values reflected in place-based planning;
7. Jobs, economic growth and innovation.

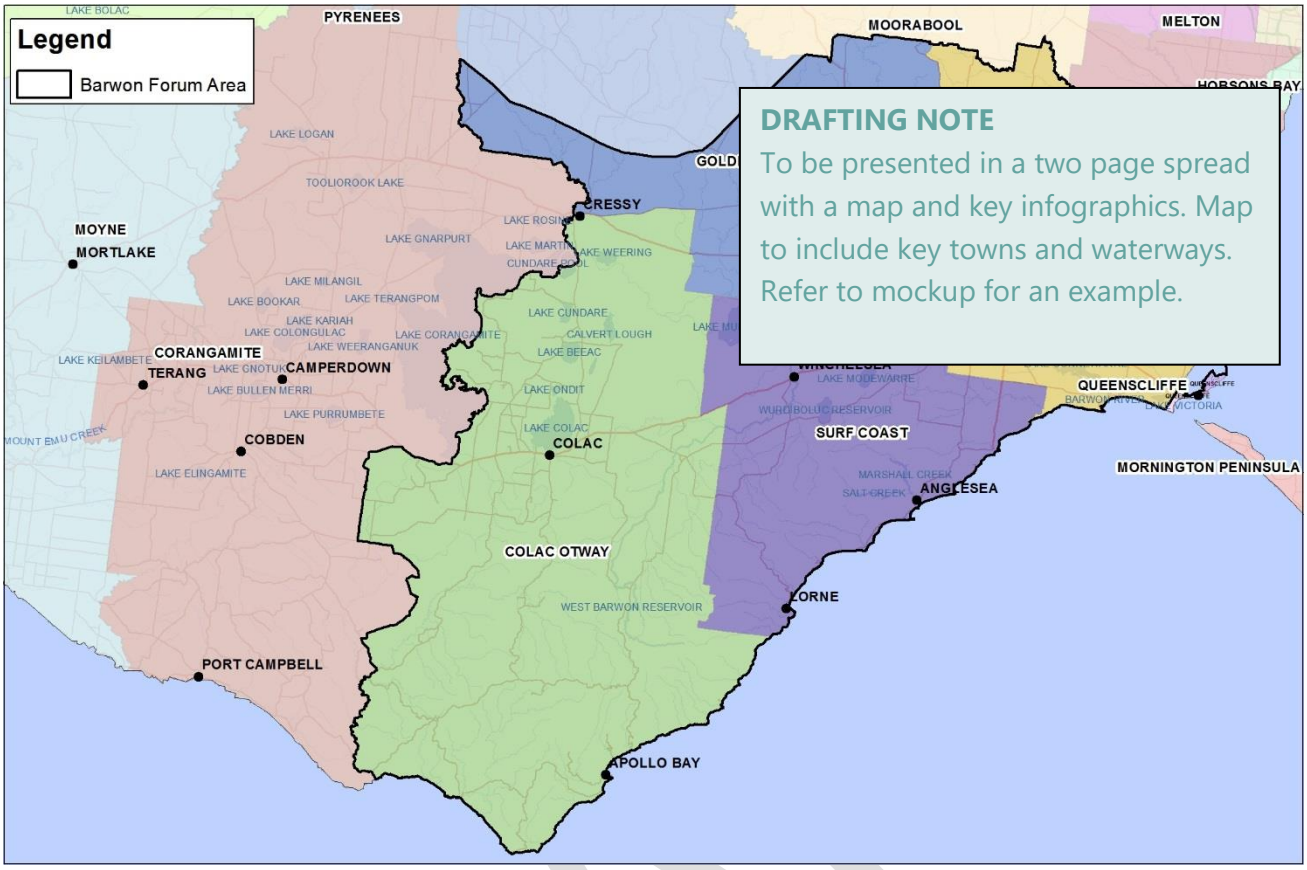
IWM Strategic Pathway

The Barwon IWM Forum has collectively agreed to deliver on the following priority opportunities (Table 1) to begin to make some short term inroads into IWM across the region and focus on responding to issues that require immediate action.

There are additional opportunities, detailed in this SDS, the IWM forum has identified as requiring further scoping and definition.

TABLE 1 BARWON REGION IWM OPPORTUNITIES

Type	Description	1-5 years	5-10 years	10-15 years
Plan	Barwon River Parklands Master Plan Review			
Plan	Regional recycled water plan			
Plan	North and Western Geelong growth area – IWM Plan			
Plan	Apollo Bay IWM plan			
Investigation	Forrest wastewater investigation			
Plan	Winchelsea IWM Plan			
Plan	Clifton Springs IWM Plan			
Plan	Sparrowvale Stormwater Master Plan			
Plan	Birregurra IWM Plan			
Project	Colac Botanic Pathway and Green Spine			
Project	Irrewillepe Stormwater Basin Upgrade			
Plan	Deakin University (Waurn Ponds) IWM Plan			
Plan	Bannockburn IWM Plan			
Project	Underground stormwater trial BOQ			
Project	Stead Park Recycled Water project			


Legend
Barwon Forum Area
PYRENEES
MOORABOOL
MELTON
HOBSONS BAY
LAKE LOGAN
TOOLIOROOK LAKE
MOYNE
MORTLAKE
LAKE GNARPURT
LAKE MILANGIL
LAKE BOOKAR
LAKE TERANGPOM
LAKE KARIAH
LAKE COLONGULAC
LAKE WEERANGANUK
LAKE KEILAMBETE
CORANGAMITE
TERANG
LAKE GNOTUK
CAMPERDOWN
LAKE BULLEN MERRI
LAKE PURRUMBETE
COBDEN
LAKE ELINGAMITE
LAKE CUNDARE
CALVERT LOUGH
LAKE BEEAC
LAKE ONDIT
LAKE COLAC
COLAC
COLAC OTWAY
WEST BARWON RESERVOIR
PORT CAMPBELL
APOLLO BAY
LAKE MODEWARRE
WURDIBOLUC RESERVOIR
SURF COAST
QUEENSCLIFFE
MARSHALL CREEK
SALT CREEK
ANGLESEA
LORNE
MORNINGTON PENINSULA
DRAFTING NOTE
To be presented in a two page spread with a map and key infographics. Map to include key towns and waterways. Refer to mockup for an example.

CHAPTER 1 – IWM in the Region

The water cycle system is complex and interrelated, with many stakeholders having a role to play in managing its various aspects. Due to its complexity, it is important we work together and take an integrated, cross agency management approach to achieve the desired outcomes agreed to by the Barwon IWM Forum to ultimately plan, manage and deliver better water services.

DRAFTING NOTE

Include picture/styling in background.

Introduction

This Integrated Water Management (IWM) Strategic Directions Statement (SDS) is an agreement between the stakeholders also known as the Barwon IWM Forum. It delves deeper into the challenges facing the Barwon Region, issues requiring action and opportunities that require a collaborative response for long term regional prosperity.

The Barwon IWM Forum has agreed to the following vision, purpose and principles:

Vision

Integrated, collaborative management of the water cycle that enables sustainable environmental, social, cultural and community prosperity for the Barwon Region.

Purpose

The purpose of the Barwon Integrated Water Management Forum (the Forum) is to provide a collaborative platform for overseeing, supporting and, where necessary, facilitating water's contribution to community prosperity, resilience and liveability in the Barwon Region.

Principles

The Barwon IWM Forum is governed by set of principles developed by the Chair and Forum partners:

1. Water management across the Barwon Region must be sustainable and ensure that there will be secure supply of quality water available to meet environmental, cultural and societal needs for the future.
2. Sustainable management of water will enable economic prosperity.
3. Water management includes ensuring healthy communities and healthy environments exist across the Region, enabling communities to experience, enjoy and actively participate in outdoor recreation and cultural practices.
4. Integrated water management is underpinned by regional collaboration.

.

Background

An Integrated Water Management (IWM) Framework for Victoria, released in September 2017, was designed to help regional stakeholders work together, ensuring integrated water cycle management contributes to the liveability of towns and cities in Victoria, with communities at the centre of decision making. Central to the IWM Framework is the establishment of high level IWM forums to help stakeholders work more effectively together in applying IWM in practice within a defined region. The IWM forums will identify, prioritise and oversee the implementation of critical collaborative opportunities. (Further information is outlined in the Integrated Water Management Framework for Victoria, available at https://www.water.vic.gov.au/liveable/resilient-and-liveable-cities-and-towns/iwm-framework.)

The aim of the Barwon Region IWM Forum, set out by an agreed Terms of Reference, is to build on and further develop the relationships and capability that exist in the Barwon Region. The Forum will enable an IWM vision and strategy that will provide direction for priority IWM opportunities and process transformations that can support resilient and liveable cities and towns in the Barwon Region into the future.

The Barwon IWM Forum works with the Barwon Integrated Water Cycle Management Network (IWCM Network), an established collaborative practitioner network initiated in 2012. The IWCM Network has a defined process for IWM across the Barwon Region and works together to share learnings and deliver regional projects.

In addition, the State Government has established a Resilient Cities and Towns (RCT) Reference Group which supports the implementation of integrated water management and planning across the state. The Reference Group provides advice to DELWP on the development and implementation of key initiatives in relation to policy, processes or knowledge gaps.

Enduring collaboration

The Barwon IWM Forum

The Barwon IWM Forum is comprised of key organizations (Table 2) who manage various aspects of the water cycle and how it contributes to the liveability of towns and cities across the Region.

TABLE 2 BARWON IWM FORUM MEMBERS

Organisation	Responsibilities
Barwon Water	Barwon Water provides safe, secure and affordable water services to customers comprising urban and rural water supply, sewerage and trade waste disposal and treatment and recycled water services.
Corangamite Catchment Management Authority (CCMA)	The CCMA are the floodplain management authority (riverine flooding) and are considered the caretakers of river health. They have stewardship roles for landcare, biodiversity, pest and salinity management. Corangamite CMA also has a statutory role in meeting the Authority's statutory responsibilities under the Water Act 1989, Building Regulations 2006 and the Planning and Environment Act 1987.
Local Councils - City of Greater Geelong - Colac Otway Shire - Borough of Queenscliffe - Golden Plains Shire - Surf Coast Shire	Councils provide a wide variety of services to their municipalities and enforce various federal, state and local laws for their communities. These services include stormwater management, public health, traffic, parking, animal management and land use planning, reserve and asset management. Community infrastructure maintained by councils in Victoria is estimated to be valued at over $40 billion and includes roads, bridges, drains, town halls, libraries, recreation facilities, parks and gardens.

Department of Environment, Land, Water and Planning (DELWP)	In partnership with government agencies, the Department manages public land, forests, water resources, catchments and waterways, and infrastructure.
Department of Health and Human Services	The Department develops and delivers policies, programs and services that support and enhance the health and wellbeing of all Victorians.
Southern Rural Water Corporation	The Corporation operates irrigation districts at Maffra, Bacchus Marsh and Werribee, manages seven major dams and licences groundwater users and river diverters across the southern half of Victoria.
Eastern Maar and Wathaurung Aboriginal Corporation	Traditional Owner Corporations hold significant rights to the land and have cultural obligations to manage traditional lands and waters. They are equal partners in ensuring catchment health. In many cases, Traditional Owners rights over Crown land and waterways are recognised in settlement agreements (covering over 40 parks and reserves) and governance arrangements to ensure their perspectives, knowledge and interests are valued.

The forum needs to ensure it establishes relationships with existing partnerships including the G21 Geelong Regional Alliance and the Corangamite Catchment Management Regional Partnership to maximise collaborative efforts across the region in realising opportunities. We also need to be aware of the relevant legislation and regional strategies that fit under the IWM banner and better understand the interrelationships between those legislation/strategies and implications for IWM and the regions liveability (Refer Attachment 2 – IWM Stakeholders – responsbilities, legislation and strategies).

Role of the IWM Forum

The role of the Forum is to collectively provide leadership, authority and strategic guidance for IWM planning across the Barwon Region with a focus on:

- identifying, prioritising and supporting progress of IWM opportunities using an agreed criteria or process
- discuss and confirm the roles and responsibilities of members, and identify and invite appropriate participants from other organisations, when relevant
- discuss and confirm the principles to be adopted for developing IWM Plans, and resolving resourcing issues related to IWM planning and programs including, when necessary, formal funding agreements
- provide a coordinated approach to inform regional policy and strategies, including Sustainable Water Strategies and Long-Term Water Resource Assessments
- Provide vision, direction and endorse the Strategic Directions Statement (SDS) for the Barwon Region for the Minister for Water to be reviewed at least every two years or as decided by Forum participants.

The Forum itself meets 3-4 times per year, and includes the senior executives of each organization. However, the bulk of the work is undertaken at the practitioner level by the IWCM Network and sub working groups, who have been nominated by each organization.

Outcome Areas for the Barwon IWM Forum Region

The Barwon Region IWM Forum is taking a systems thinking approach to the water cycle. We need to consider the Regional and local perspectives for IWM and the challenges facing the region. We have agreed to a vision and the following strategic outcomes and objectives (summarised in Table 3) and committed to collaborating and working effectively together for our regions long term prosperity.

IWM Outcomes

The outcomes are what we are seeking to achieve over the longer term from the deliberate application of Integrated Water Management across the Barwon Region. These outcomes have been derived from those articulated in Water for Victoria and the IWM Framework for Victoria. Each of these seven outcomes will be key in shaping the liveability, prosperity and resilience of our cities and towns. The outcomes will assist in developing the strategy and prioritising the IWM opportunities for the Region

Outcome 1 - Safe secure and affordable supplies in an uncertain future

As the region continues to develop and grow, we need to provide safe, secure and affordable water supplies across the Region. There is potential for alternative water supplies such as recycled water and stormwater to make a significant contribution to alleviating medium term threats to drinking water supply security including during peak holiday periods (e.g. Lorne, Apollo Bay).

Objectives

- *A diverse range of water supplies and resources*
- *Water quality meets regulatory standards and community expectations*
- *Efficiently managed water and demand*
- *Secure and diverse water supplies for industry, agriculture, health, culture, recreation and economy*
- *Water available to maintain valued green community assets*
- *Managing high quality groundwater for agricultural purposes*

Outcome 2 - Effective and affordable wastewater systems

The Black Rock Water Reclamation Plant is the largest in the Region and services the greater Geelong, Bellarine and Surf Coast areas. Many smaller townships in the Region utilise domestic scale septic tank systems. Municipal councils are responsible for regulating domestic wastewater management. Golden Plains Shire, Colac Otway Shire and Surf Coast Shire are in the process of reviewing this approach. Lack of sewerage services in some small, yet growing towns such as Forrest and Inverleigh

are a challenge for the Region due to their inability to service growing populations and the potential impacts of overflows into the environment.

Objectives

- *Meets public health and environmental standards*
- *Effective and affordable sewerage systems*
- *Waste-to-resource opportunities are maximised including recycled water and energy*

Outcome 3 - Avoided or minimised existing and future flood risks

There is increased pressure on local government stormwater systems and overland flooding provisions, due to a range of factors including ageing infrastructure, increasing urbanisation and impermeable surfaces, urban consolidation and increasing frequency of intense rainfall events. Accordingly, flood risk is a growing concern in urban areas, downstream land uses and the receiving water bodies such as the bay, rivers and lakes. There is potential for urban development areas both greenfields and brownfields sites through innovative IWM approaches to minimise localised flooding risk and contribute to catchment based stormwater strategies to address increases in flood volume and frequency. An integrated approach to stormwater could also reduce the demand on drainage assets (e.g. Colac West – Deans Creek).

Objective

- *Community and property resilience to local flood risk*
- *Prevent the likelihood of contamination via runoff*
- *Meets best practice water quality requirements*
- *Location and use of retention systems to support re-use initiatives*
- *Establish and preserve overland flow paths*
- *Develop regional urban stormwater management policy and strategy*

Outcome 4 - Healthy and valued waterways and marine environments

With climate change impacting river and lake water quality in addition to treated wastewater discharge via ocean outfalls and runoff from growing industrial sites, our waterway and marine environments are being impacted. We need to collaborate to ensure we minimise our impacts on these ecosystems that provide us immeasurable health and wellbeing benefits is critical and clarify roles and responsibilities around rural drainage and river management.

Objectives

- *Waterway health is understood and improved*

- *Marine environment health is understood and maintained*
- *Establish a clear position on roles and responsibilities for rural drainage and river management including water quality and security of supply*
- *Groundwater dependent ecosystems are well managed*

Outcome 5 - Healthy and valued urban, agricultural, rural and green landscapes

Developing and maintaining healthy urban spaces including recreational and green spaces provides health and well-being benefits to communities including physical and mental well being. The Region's natural assets are valued not only for their cultural heritage benefits but also their attraction for tourism. Healthy agricultural spaces will support a growing agricultural sector. This outcome supports a growing economy and a prosperous Region.

Objectives

- *Active and passive recreation supported by water*
- *Improved connectivity and access to green and blue spaces*
- *Urban landscapes retain moisture for cooler, greener cities and towns*
- *Waterways and coastal environments accessible as valuable open space*

Outcome 6 - Traditional owner and community values reflected in place-based planning

We acknowledge Aboriginal people as the Traditional Owners and custodians of the land and water on which they rely. Traditional Owners have a strong connection to water as a vital part of their life and culture. Traditional Owners are represented by the five Aboriginal group across the Barwon region including the Wadawurrung, Kuu Yang Maar, Eastern Maar, Guli-Gad and Wathaurong Aboriginal Co-Operative.

Objectives

- *Aboriginal cultural values associated with waterways acknowledged, understood, protected and applied*
- *Effectively engaging communities to better understand cultural and community values*
- *Local water related risks and issues understood and managed*

Outcome 7 - Jobs, economic growth and innovation

Water will play a key role in supporting economic growth and development including industry, a growing agricultural sector and a thriving tourism sector. Maintaining the quality of aquatic and coastal environments is core to the tourism industry in the Region. Being innovative in how we ensure water is available for growing and diverse industries requires us all to work together and collectively make decisions the result in the best outcomes.

Objectives

- *Integrated water management enables jobs and economic growth*
- *Ensuring security and diversity of supply to enable economic growth*
- *Leveraging knowledge and resources to support innovative and collaborative outcomes*

TABLE 3 SUMMARY OF OUTCOMES AND OBJECTIVES

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

CHAPTER 2 – A case for IWM

Understanding why an integrated approach to water planning and management is critical for the Barwon IWM Region now and for the future.

FIGURE 1 BARWON REGION LOCAL GOVERNMENT AREAS

Regional and local perspectives for IWM

The Barwon IWM Region is located in regional Victoria, to the west and south west of the Melbourne metropolitan area. The Region includes large areas of land used for farming, National Parks, Marine National Parks and highly productive rural areas in the central and western parts of the Region. The Region is comprised of five local government areas (Figure 1).

Understanding the needs of our Region

Water and the water cycle is a major aspect of the long term sustainability and prosperity of our Region. It is vital in ensuring our natural assets remain healthy and vibrant, and ensuring the long term health and wellbeing of:

- our community - ensuring access to water services and green and active spaces;
- our economy - ensuring water is available to support a growing economy;
- our environment - ensuring our natural assets continue to remain healthy and vibrant.

The Barwon Region and the local government areas (detailed in Attachment 3) that make up this Region are responding to challenges which include meeting the needs of a growing economy, population growth, changing community needs and expectations and impacts of climate change. We understand the regional context is constantly changing and will need to be reviewed and updated regularly.

The following starts to delve deeper into the challenges we are facing across the Barwon Region. These challenges include:

1. Population growth

It is estimated the population of the Barwon Region will increase from 266,400 in 2011 to 359,100 by 2031. Impacts of growth on the Region include:

- increased demand for land and housing
- increased demand for services including water, sewerage and drainage
- increase demand for recreational open space, green space, access to natural areas
- poor urban design practices contributing to the negative health impact of some communities across the region
- urbanisation causing increased runoff volumes and the introduction of a variety of pollutant sources into waterways and marine environments.

The Region is a destination for national and international visitors which results in dramatic increase in populations during holiday periods, especially along coastal areas.

Impacts of not taking an integrated approach to water planning in response to population growth include inability to provide safe, secure and affordable water, sewerage and drainage services, lack of

accessible green and open spaces, detrimental impacts of pollution into our waterways and marine environments to name a few.

a. Issues

The IWM Forum has identified a number of issues facing the Region due to population growth over the next 5 and 10-15 years (Table 4).

TABLE 4 ISSUES IN RESPONSE TO POPULATION GROWTH

5 years	10 – 15 year
- Policy and planning needs to support IWM in practice - Aligning regional policy and land use planning - Managing changing demand for water including industry changes (eg. milk production) & tourism seasonal fluctuations	- Balancing increasing population growth including new users demand (ie industry and agriculture) with decline in water availability and seasonal fluctuations - Balancing development yield vs other benefits (eg. environment) - Diversifying water supplies (increasing over time) - Small town sewerage - All water users need to better understand the value of water and take action to be sustainable with their water use - Facilitating more peri-urban agriculture - New infrastructure challenges (e.g. recycled water)

b. Opportunities

The IWM Forum and IWCM Network have identified opportunities in response to the issues relating to population growth (Table 5), some of which are yet to be more clearly defined.

TABLE 5 OPPORTUNITIES FOR RESPONDING TO POPULATION GROWTH

Opportunity	Description	Status
Plan	North and Western Geelong Growth Area – IWM Plan	Priority
Policy	Integration of IWM with planning and policy	To be defined
Build capacity	IWM training delivered to build capability in IWM planning and organisational change	To be defined
Investigation	Future State report - taking a systems approach	To be defined

2. Climate Change

The impacts of climate change pose a significant risk for the Barwon Region due to:

- Sea level rise and coastal erosion where infrastructure assets are at risk. It is projected to increase in the order of 0.08 to 0.18 m above the 1986–2005 levels (Climate Resilient Communities). The Borough of Queenscliffe is most at risk across our Region.
- Temperature rise where warming is projected to be around 0.6 to 1.2°C above that of 1986–2005 (South West Climate Change portal). Temperature rises will result in increased heat-related stress and mortality among aged and 'at risk' populations as well as a higher risk of bush fire. Inland rural areas may be most vulnerable to the impacts of temperature rise as are urban developments that have not accommodated enough green space to provide shade.
- Reduced rainfall resulting in reduced run off into waterways, impacting waterway health as well as accessibility of surface water for provision of drinking water and irrigation for recreation and open space and a growing agriculture sector. The major waterways that are of significance in the Barwon Region includes the Barwon and Moorabool Rivers. The majority of stream lengths in the Barwon and Moorabool basins were in moderate or poor condition (CCMA Waterway Strategy 2014-2022).
- Changes in rainfall patterns resulting in more high intensity rainfall in urban areas impacting urban drainage and increasing the likelihood of sediment, nitrogen, and other pollutant loads into waterways and marine environments.
- Importance of minimising flood risk through flood mitigation given the increased intensities from rainfall events, chance of flash flooding and reliance on overland flow paths to manage the risk.
- Significant risks to underground water system infrastructure assets, including drinking water pipes, sewerage and stormwater infrastructure. It is critical to ensure planning and design decisions ensure these assets are resilient to climate change.

The Region needs to consider climate change impacts across the region including impacts on waterways, marine environments, biodiversity, infrastructure assets and the health and wellbeing of our community.

a. Issues and opportunities

The IWM Forum has identified a number of issues facing the region due to climate change over the next 5 and 10-15 years (Table 6).

Table 6 Issues associated with Climate Change impacts

5 years	10 - 15 year
- Stormwater management in Geelong/Ramsar and regional areas	- Increasing pressure on stormwater infrastructure and managing events - The need to clarify responsibilities management responsibilities for climate change planning/response - Ensure adequacy of design for 1:10 ARI storms events given climate impacts) - Coastal sea level rise

	- Security of supply to industry and impacts on others (eg. irrigated agriculture & recycled water) - Retention of water at source where possible

b. Opportunities

The IWCM Forum and IWCM Network have identified opportunities in response to issues relating to climate change (Table 7), some of which are yet to be more clearly defined.

TABLE 7 OPPORTUNITIES IN RESPONSE TO THE IMPACTS OF CLIMATE CHANGE

Opportunity	Description	Status
Plan	Barwon River Parklands Master Plan Review	Priority
Investigation	State of marine coastal and waterways environment report	To be defined
Plan	Sparrowvale Stormwater Master Plan	Priority
Project	Irrewillepe Stormwater Basin Upgrade	Priority
Plan	Deakin University (Waurn Ponds) IWM Plan	Priority
Project	Underground stormwater trial BOQ	Priority

2. Changing community needs and expectations

The Barwon Region is constantly changing. The region has a strong indigenous cultural background and a changing population demographic due to national and international people migrating to the Region.

Townships such as Queensliffe have a higher aging population and there are variations of both high and low socio economic areas across the Region.

Water is an important aspect of the aboriginal culture and is an important part of ensuring communities, regardless of their demographics, have access to recreational, green and natural spaces that in turn support their physical and mental health. Areas of socio-economic disadvantage across the region includes Bell Park, Corio, Norlane, St Leonards, Thomson, Whittington, Indented Head, St Leonards, Portarlington, Winchelsea and Colac.

The range of diversity in culture, demographics and socio economic factors result in varying community needs and expectations across our Region that we are having to continue to review and respond. These community needs and expectations include:

- Acknowledging and protecting our cultural heritage. Water is the lifeblood for Country and the basis of many creation stories. Waterways are a historical and ongoing source of food, fibre and medicine, important place to camp, hunt, fish, swim and connect with traditional culture and stories (CCMA Waterway Strategy 2014-2022). It is important waterways are healthy and flowing to maintain cultural heritage and traditions.

- Ensuring we continue to provide for the growing health and well-being of our community. As stated in the G21 region health profile, the proportion of people across the region who rated their health as excellent/very good (ranged from 52.7% to 59.0% v's 46.6% except in Greater Geelong where it was 45.1%. Rates of population in all LGAs that had sufficient levels of physical activity ranged from 65.6% to 78.3% v's 63.9%. Physical activity contributes to helping prevent diseases including cardiovascular disease, diabetes, some cancers, injury and control and the promotion of mental health including providing a sense of well-being and creating social connections. Low socio economic regions have generally lower level of health and wellbeing.

a. Issues

The IWM Forum has identified a number of issues facing the region due to changing community needs and expectations over the next 5 and 10-15 years (Table 8).

TABLE 8 ISSUES ARISING DUE TO CHANGING COMMUNITY NEEDS AND EXPECTATIONS

5 years	10 -15 year
• The need to clarify responsibilities for rural drainage and river management • The role of healthy urban waterways and connected open space in the liveability of the region by enhancing wellbeing • Water as an enabler of broader outcomes • Establish community water values and future aspirations regarding water cycle management • Community concerns regarding extraction of water from local environments for use by others • No current resolution for the Alcoa coalmine closure impacting Anglesea river (linked to Anglesea futures but needs to have a water focus and IWM solution)	• Water's role in building health resilience into cities & towns is not well understood • Cultural and environmental value of water not equal to social, economic and equity across users • Increasing water literacy (and link to liveability/amenity)

b. Opportunities

The IWCM Forum and IWCM Network have identified the opportunities in response to issues relating to community needs and expectations (Table 9), some of which are yet to be more clearly defined.

TABLE 9 OPPORTUNITIES IN RESPONSE TO CHANGING COMMUNITY NEEDS AND EXPECTATIONS

Opportunity	Description	Status
Plan	Winchelsea IWM Plan	Priority

Plan	Apollo Bay IWM Plan	Priority
Plan	Birregurra IWM Plan	Priority
Plan	Clifton Springs IWM Plan	Priority
Project	Colac Botanic Pathway and Green Spine	Priority
Plan	Bannockburn IWM Plan	Priority
Project	Stead Park Recycled Water project	Priority
Plan	Anglesea Futures IWM Plan	To be defined
Plan	Lake Colac Masterplan	To be defined

3. Economic growth and development

According to the G21 Economic Development Strategy, 'The Region is geographically, economically and culturally diverse. The Region has undergone significant transformation from a major heavy manufacturing centre over the last 15 years, diversifying into higher technology manufacturing, healthcare, education and other sections as well as expanding its cultural offering.'

The City of Greater Geelong is a major centre for investment with over 17,000 businesses and a highly skilled labour force of 110,632 (Enterprise Geelong). The total number of businesses in Greater Geelong in June 2017 was 17,271. This represents an increase of 826 businesses (5.02%) from the June 2015 total of 16,445 businesses and compares to an increase of 1,242 businesses (5.29%) in the Barwon Region. (Remplan)

The agriculture sector across the Barwon Region is expanding into more intensive agriculture, such as poultry, which will enhance existing food processing activity in Geelong and Colac (G21 Regional Growth Plan). To support this development, we need to ensure water will be available, seeking alternative supplies to drinking water where possible.

Tourism is also an important contributor to the Region's economy with the region home to a number of tourism assets and events. The number of visitors to the Region is expected to rise to over nine million by 2030. This has a significant impact on services in coastal towns where population can triple during holiday periods.

We need to be innovative in working with businesses to ensure they have access to water and sewerage services, ensuring we are efficient in how water is used and are able to access affordable alternative water sources. It is important the practices of businesses does not have a detrimental impact on our waterways and marine environments through pollution runoff. Coastal towns should have the ability to develop and grow and have access to secure water and sewerage services that support fluctuations in populations due to tourism.

In taking an IWM approach to planning, the issue around who pays for infrastructure can be challenging with multiple stakeholders with different drivers and decision making processes. The assets generated in IWM projects serve a wide variety of functions and deliver outcomes that go beyond current regulatory requirements and determining who pays can be challenging.

a. Issues

The IWM Forum has identified a number of issues facing the region due to IWM supporting growing economic and development over the next 5 and 10-15 years (Table 10).

TABLE 10 ISSUES ARISING DUE TO ECONOMIC GROWTH AND DEVELOPMENT

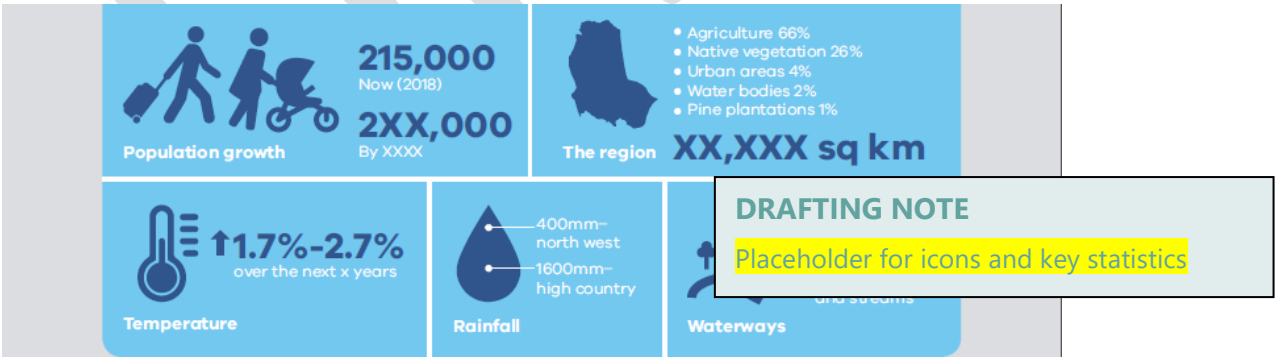
5 years	10 -15 year
• Confirming if there are limiting opportunities for tourism and the arts • Managing water security for coastal communities • Lake Colac doesn't support recreational expectations and economic outcomes • Cost differential between potable and alternative supplies if driving perverse outcomes for economic development and environment	• Affordability of diverse water supplies to support economic growth activities and appropriate use of water supplies eg recycled water, stormwater • Security of potable supply

b. Opportunities

The IWM Forum and IWCM Network have identified opportunities in response to issues relating to growth and development (Table 11, some of which are yet to be more clearly defined.

TABLE 11 OPPORTUNITIES IN RESPONSE TO ECONOMIC GROWTH AND DEVELOPMENT

Opportunity	Description	Status
Investigation	Forrest wastewater investigation	Priority
Plan	Regional recycled water plan	Priority



Success Stories

There has been a lot of great work over the years by state and local government, regional agencies, communities, planning bodies and boards to identify what we need to do to address the challenges and opportunities in the region. Three completed projects are outlined below.

Colac IWCM Plan

The Colac Integrated Water Cycle Management (IWCM) Plan is a strategic blueprint for how the urban water cycle can make a positive contribution to Colac's liveability. The plan applies a whole of water cycle system approach to identify and develop opportunities to enhance aspects of the urban water cycle to make a positive contribution to broader liveability aspirations for the city. Its primary objectives were to:

- Raise awareness of the role of the water cycle in achieving Colac's future aspirations for liveability, sustainability and productivity; and
- Identify opportunities for IWCM solutions to enhance Colac's ability to become a healthier, greener, 'botanic' city.

The plan has led to implementation of rainwater gardens in the centre of Colac and the securing of a grant to develop detailed designs to upgrade the Irreweillipe Road Retarding Basing. The plan has also informed the Colac 2050 Strategic Planning project to ensure that future growth of Colac is undertaken in accordance with IWM principles.

Jan Juc Creek Daylighting

In 2012, the 'Friends of Jan Juc Creek Reserve' (FJJCR) community group presented Council with the idea of reinstating sections of the creek to a more natural state by removing underground drainage infrastructure and recreating the creek channel (daylighting). The project involved decommissioning and modifying the existing underground drainage, returning stormwater flows to the surface of the creek, building a sedimentation basin, and reshaping creek banks. Extensive replanting of indigenous species was also undertaken to restore natural habitats. Daylighting the creek enhanced the biodiversity and public amenity, strengthened the ecological value of the waterway and improved stormwater runoff quality.

Urban Water Planner

Integrated Water Cycle Management (IWCM) is about managing the interaction between the urban environment and the water cycle. The urban water planner provides a resource for urban developers, consultants and planners to consider water cycle aspects in new urban development including natural aspects (e.g. waterways and floodplains), built aspects (e.g. major drainage, land use, open space and water sensitive urban design), and servicing aspects (e.g. drinking water, sewerage and alternative, fit-for-purpose water sources). By working with the relevant agencies and incorporating IWCM principles early in the process, developers and consultants can save time, resources and money.

CHAPTER 3 – IWM Opportunities

A portfolio of IWM projects and strategies for which IWM collaborative partners have committed themselves to applying their best endeavours to progress.

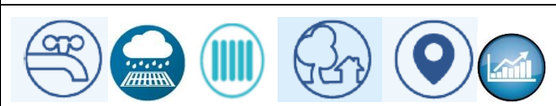
38 IWM opportunities have been identified and prioritised down to 15 by assessing the extent of likely impact, or benefit of the opportunity if achieved and 'ease of implementation' of the opportunity.

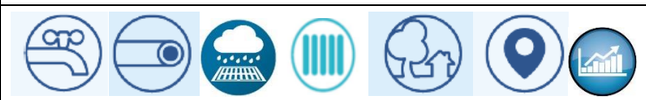
DRAFTING NOTE

Include picture/styling in background.

Chapter 3 - IWM Project & Strategy Opportunities – Overview

A summarised list of priority IWM opportunities as endorsed by the Forum is shown in the table below, with more detail in the following section.

Opportunity	Type	Strategic Outcomes alignment	Location	Scale	Lead	Status	Timeframe (S/M/L)	Links to other strategies
Barwon River Parklands Master Plan Review	Plan		Barwon River from Geelong ring road through to Barwon Heads	Forum Area	Corangamite Catchment Management Authority	Endorsed by partners as a priority project for the Corangamite Catchment Partnership (CPA) Agreement. CCMA to hold stakeholder meeting in August.	S	G21 [insert strategy] Corangamite Regional Waterway Strategy?
Regional Recycled Water Plan	Plan		At all water reclamation plants	Forum Area	Barwon Water	In progress, being led by Barwon Water	S	Urban Water Strategy 2018 (Barwon Water)
North and Western Geelong Growth Area – IWM Plan	Plan		Geelong	Region	City of Greater Geelong	Community engagement being undertaken	S	Geelong settlements Strategy
Apollo Bay IWM Plan			Apollo Bay	Region	Barwon Water	In progress	S	Barwon Water Strategy 2030
Forrest Wastewater Investigation	Investigation		Forrest	Town	Barwon Water	In progress, being led by Barwon Water	M	Barwon Water Strategy 2030
Winchelsea IWM Plan	Plan		Winchelsea	Town	Surf Coast Shire	DELWP funding has been approved and scope is being developed to engage consultant	S	Growing Winchelsea
Clifton Springs IWM Plan	Plan		Clifton Springs and Drysdale	Town	City of Greater Geelong	In progress, being led by Barwon Water with COGG and BW funding	S	TBD
Sparrowvale Wetland Flood/ Stormwater Master Plan	Plan		Marshall	Precinct	City of Greater Geelong	Wetland Master Plan and Drainage Design has only just commenced	S	RAMSAR Management Plan
Birregurra IWM Plan	Plan		Birregurra	Town	Colac Otway Shire		S	Colac 2050

Colac Botanic Pathway and Green Spine	Project		Colac	Town	Colac Otway Shire	Colac 2050 expected to be completed in the next 2 months	M	Colac 2050
Irrewillepe Stormwater Basin Upgrade	Project		Colac	Town	Colac Otway Shire	Funding for upgrade design has been secured. Design will be developed by November 2018	S	Colac 2050
Deakin University Waurn Ponds IWM Plan	Plan		Deakin University Waurn Ponds campus	Town	Deakin University	In progress, being implemented and funded by Deakin	S	
Bannockburn IWM Plan	Plan		Bannockburn	Town	Golden Plains Shire	Deferred until 2019-20	M	Bannockburn Structure Plan
Underground stormwater trial	Project		Point Lonsdale	Precinct	Borough of Queenscliffe	Proposal submitted; awaiting response from DELWP	S	Stormwater strategy???
Stead Park Recycled Water	Project		Stead Park, Corio	Lot Scale	Barwon Water	Not yet progressed; requires proposal from COGG	M	Barwon Water Strategy 2030

Attachment 1 - IWM Opportunities – In depth

Plan - Barwon River Parklands Master Plan Review

The Barwon River Parklands is a long-envisioned idea for creating a continuous active travel pathway extending from Geelong to Barwon Heads along the Barwon River. Incorporated as a strategically planned component of the G21 Adventure Trails Priority Project, the Parklands project builds on the popular recreation opportunities of the existing trail network through Geelong to create an iconic walking and cycling route along the river which has such valuable cultural, environmental and social values to the regional community. The project would involve a review of the master plan and reinvigorating the connections between multiple stakeholders to identify practical initiatives and projects that can contribute to achieve the long term vision. There are opportunities to leverage and integrate with other projects such as recreation/amenity upgrades within the Geelong segment and Barwon Water's land at Aqueduct Park.

STATUS	Endorsed by partners as a priority project for the Corangamite Catchment Partnership (CPA) Agreement. CCMA to hold stakeholder meeting in August 2018.
LEAD AGENCY	Corangamite Catchment Management Authority
LOCATION	Barwon River from Geelong ring road through to Barwon Heads
TIMEFRAME	1-5 years
PARTNERS	Parks Vic, Barwon Water, Greater Geelong City Council and Regional Development Victoria
SCALE	Forum Area

NEXT STEPS

- Corangamite CMA to hold stakeholder meeting in August 2018.

Plan - Regional Recycled Water Plan

In keeping with its commitment to achieve Zero Waste, Barwon Water is developing a strategic plan to reuse 100 per cent of the recycled water generated from its water reclamation plants. At present only about 25% of this resource is re-used at the regions 10 Water Reclamation Plants. This ambitious target will require a significant step-change. The Plan would consider short medium and long term opportunities and a strategic framework to accommodate future needs.

STATUS	In progress
LEAD AGENCY	Barwon Water
LOCATION	At all water reclamation plants
TIMEFRAME	1-2 years
PARTNERS	
SCALE	Forum Area

NEXT STEPS

- Commence development of the recycled water plan

Northern and Western Growth Area – IWM Plan

The Northern and Western Geelong Growth Area is the largest urban growth project in regional Victoria with the potential to welcome more than 110,000 new Geelong residents. The project will address the long-term growth needs of Geelong, facilitating diverse and affordable housing and employment opportunities for the city over the coming decades.

The framework plan will identify infrastructure that is required to support Geelong's new communities and will specify the orderly sequencing of development to ensure that early provision of essential infrastructure is prioritised as each neighbourhood is delivered.

The Northern Geelong Growth Area, in Lovely Banks, has a study area of 2,089 hectares and is anticipated to deliver up to 18,000 new dwellings for a population of approximately 48,000 residents. The Western Geelong Growth Area, in Batesford, has study area of 3,245 hectares and is anticipated to deliver up to 22,000 new dwellings for a population of approximately 62,000 residents. The Western Geelong Growth Area includes more than 20 kilometres of river frontage to the Barwon and Moorabool Rivers and Cowies Creek.

Draft IWM plans have been prepared in partnership between the City of Greater Geelong and Barwon Water. The outcomes of the final reports will inform the framework plan. The project will highlight the importance of integrated water management and the opportunities to incorporate IWM into urban development. The subsequent precinct structure plan (PSP) programme will outline the detailed requirements for IWM throughout the growth areas in the coming decades.

STATUS	In progress
LEAD AGENCY	City of Greater Geelong
LOCATION	Geelong region
TIMEFRAME	5 years
PARTNERS	
SCALE	Geelong

NEXT STEPS

- Community engagement underway

Plan – Apollo Bay IWM Plan

Apollo Bay is a major tourist destination on the Great Ocean Road, which swells significantly during summer with

STATUS	In progress
LEAD AGENCY	Barwon Water

vocational residents. At the same time, the township is experiencing significant localised population growth. This is putting pressure on the limited potable water supplies available locally. Despite recent investment in off stream storage for water supplies, the town faces a medium term water security risk, which is elevated in summer peak periods. An IWM plan will consider all aspects of the water cycle system within the town and identify opportunities to address key issues including diversification of water sources, stormwater harvest and reuse, recycled water reuse and integrating water into new urban developments.	**LOCATION**	Apollo Bay
	TIMEFRAME	1-2 years
	PARTNERS	Colac Otway Shire
	SCALE	Town
NEXT STEPS - Develop project charter incorporating project objectives, governance, outcomes, risk etc.		

Investigation - Forrest Wastewater Investigation

Barwon Water and Colac Otway Shire are partnering with the Forrest community to investigate opportunities for wastewater improvements in the township; This partnership acknowledges the growing role tourism plays in Forrest and the regional economy, and the increasing stress this may place on existing wastewater systems in the town. The wastewater audit, completed in November 2017, found that there is significant and widespread issues relating to onsite wastewater management across the town. A consultant report will be prepared recommending a preferred option to address the problem for wastewater management which will incorporate input from regulators and the community.	**STATUS**	In progress
	LEAD AGENCY	Barwon Water
	LOCATION	Forrest
	TIMEFRAME	December 2018
	PARTNERS	Colac Otway Shire and Regional Development Victoria
	SCALE	Town
NEXT STEPS - Barwon Water and Colac Otway Shire will prepare business case for preferred option to be approached by COS and BW Board includes agreed Funding model to deliver a solution.		

Plan - Winchelsea IWM Plan

Winchelsea is the largest inland town in the Surf Coast Shire and is a nominated growth node. The Shire has aspirations for the town to grow from its current	**STATUS**	In progress
	LEAD AGENCY	Surf Coast Shire
	LOCATION	Winchelsea

population of 1,600 to 10,000 by 2050 which will include over 3600 new residential dwellings. The town is surrounded by agriculture, has a retail centre, and numerous community facilities. The Barwon River flows through the town which has a strong connection to water and landscape. An IWM plan will help the identify key issues for Winchelsea's water cycle system and identify opportunities to enhance the township through the application of IWM solutions, including greater use of alternative water sources and water sensitive urban design. It will also ensure natural and cultural water cycle assets such as the Barwon River are a key feature of the town's future.	**TIMEFRAME**	1-5 years
	PARTNERS	Surf Coast Shire, Barwon Water, CCMA, Wathaurung, DELWP
	SCALE	Town
NEXT STEPS - IWM plan to be completed by January 2019 - IWM opportunities prioritised and assessed using cost allocation framework		

Plan - Clifton Springs IWM Plan

The Clifton Springs landscape is identified through its relationship to the coast. There are many water assets shared by the community including reserves, water bodies, creek lines and the coast. An IWM plan for Clifton Springs should aim to re-orientate all infrastructure around the notion of connections to the existing natural catchments and landscape features.	**STATUS**	In progress, being led by Barwon Water with COGG and BW funding
	LEAD AGENCY	City of Greater Geelong
	LOCATION	Clifton Springs and Drysdale
	TIMEFRAME	5-10 years
	PARTNERS	Barwon Water, CCMA, Clifton Springs Golf Club
	SCALE	Town
NEXT STEPS - IWM plan to be completed by end of 2018 - Further IWM opportunities which will be prioritised and delivered - Funding options discussed		

Plan – Sparrowvale Stormwater Master Plan

The Armstrong Creek growth area, south of Geelong, is a rapidly expanding residential precinct,. The proposed "Sparrowvale Wetland" which utilises an area of land with existing ephemeral freshwater meadow, was identified as the ideal location for a series of proposed constructed	**STATUS**	Wetland Master Plan and Drainage Design has only just commenced
	LEAD AGENCY	City of Greater Geelong
	LOCATION	Marshall

wetlands which address flooding risk and manage stormwater quality and quantity from the developing area. The location of the proposed wetlands within a high value environmental area presents a unique and challenging opportunity as the City must ensure that our natural landscapes thrive in the face of expanding development pressures. This project should also provide a usable community amenity that becomes a valued social asset as much as an important stormwater treatment area.	**TIMEFRAME**	1-5 years
	PARTNERS	
	SCALE	Precinct
NEXT STEPS - Drainage Design will be undertaken in 2018/2019.		

Plan – Birregurra IWM Plan

Birregurra is a small rural township located in the heart of the Colac Otway Shire. Until recently, Birregurra has not been connected to a reticulated sewerage system however the town was sewered in 2012. The water reclamation plant now requires upgrade to deal with the disposal of increased recycled water. Barwon Water is also investigating water supply upgrade options including connecting the town to Colac and removing the local water treatment plant. An IWM plan will consider all aspects of the water cycle system within the town and identify opportunities to address key issues including water sources, stormwater harvest and reuse, wastewater and recycled water reuse opportunities surrounding the local Water Reclamation Plant.	**STATUS**	In Progress
	LEAD AGENCY	Barwon Water
	LOCATION	Birregurra
	TIMEFRAME	2-5 years
	PARTNERS	Colac Otway Shire
	SCALE	Precinct
NEXT STEPS - Develop project charter incorporating project objectives, governance, outcomes, risk etc.		

Project - Colac Botanic Pathway and Green Spine

This initiative proposes the creation of a continuous recreational pathway connecting the town's key water cycle assets of Lake Colac, Barongarook Creek, Beechy Precinct and back via a western edge route. Nicknamed the Botanic Link Pathway, this route would make a major contribution to support Colac as a more connected, liveable regional city.	**STATUS**	Not progressed at this stage; requires council support
	LEAD AGENCY	Colac Otway Shire
	LOCATION	Colac
	TIMEFRAME	1-5 years

The initiative links in with growth projected for 2050, particularly the growth of the town to the west where flooding issues will need to be managed through IWM strategies.	**PARTNERS**	DELWP, Barwon Water
	SCALE	Town

NEXT STEPS

- Investigations into pathway links
- Investigations in flood mitigation measures along Dean Creek.

Project - Irrewillepe Stormwater Basin Upgrade

This initiative proposes to upgrade the existing but under-performing 7.7ha Irrewillipe Road Retarding Basin stormwater retarding basin to be a showpiece of what can be achieved through water sensitive urban design (WSUD). The basin is not performing its hydraulic function effectively, has become weed infested and provides no public amenity value.

Under this initiative, the basin would be transformed into a fully functional, valued urban water asset which provides drainage retardation, recreation and amenity values, conservation values and potentially treated stormwater to service the nearby Colac Golf Course. The project will develop a concept design which can then be used to procure and construct the asset.

STATUS	In progress
LEAD AGENCY	Colac Otway Shire
LOCATION	Colac
TIMEFRAME	1-5 years
PARTNERS	DELWP, Barwon Water
SCALE	Town

NEXT STEPS

- A detailed design will be developed by Nov 2018.
- Seek funding for construction in 2019.

Plan - Deakin University Waurn Ponds IWM Plan

The Waurn Ponds Campus is projecting significant growth over the next ten years so a focus on sustainable development is required. The objective of implementing an IWM system at the Deakin Waurn Ponds Campus is to create a sustainable campus that is resilient to future growth, development and climate change. The plan proposes to encompass all aspects of water management in a way that establishes the campus as a model for sustainable water systems and will also incorporate research and teaching opportunities.

STATUS	In progress, being implemented and funded by Deakin
LEAD AGENCY	Deakin University
LOCATION	Deakin University Waurn Ponds campus
TIMEFRAME	
PARTNERS	
SCALE	Town

NEXT STEPS

- IWM plan under development

Plan - Bannockburn IWM Plan

Bannockburn is the largest township in the Golden Plains Shire and is growing rapidly at 8.5% per annum (2015-2016). Much of this growth is being accommodated through greenfield development. This project proposes to use an IWM approach to consider a range of opportunities relating to the water cycle within the town. This includes stormwater harvesting, Class C recycled water use, stormwater management, WSUD, appropriate growth, enhancing amenity of open space and walkability of the town's water assets etc. An IWM plan will help identify these opportunities and proposes potential solutions which could translate to future projects throughout the township.

STATUS	Deferred until 2019-20
LEAD AGENCY	Golden Plains Shire
LOCATION	Bannockburn
TIMEFRAME	1-5 years
PARTNERS	Barwon Water etc.
SCALE	Town

NEXT STEPS

- Delayed until 2019/20 when resourcing and finances become available

Project - Underground stormwater trial BOQ

This initiative proposes to develop a streetscape scale stormwater disposal process direct to groundwater that could be transferable to other areas with sandy permeable soils.
This project was originally initiated due to an increased number of localised flooding events at Simpson St, Point Lonsdale. Part of a solution that has been recommended by the consultant is to increase the number of soak pits in the area with the aid of geotechnical investigations to better support design and locations of these pits. Under this project, these soak, or infiltration pits could be configured as raingardens in existing swales, greatly improving the amenity and multi-functionality of the soakage process.

STATUS	Scope in negotiation
LEAD AGENCY	BOQ
LOCATION	Queenscliff
TIMEFRAME	1-2 years
PARTNERS	
SCALE	Lot/sub catchment Scale

NEXT STEPS

- Scope to be approved

Project - Stead Park Recycled Water

Stead Park is a major area of public open space in the northern suburbs of Geelong. It has multiple users including cricket, football, softball, hockey and soccer, as well as playground facilities and of course is a venue for general active open space use.

It is immediately adjacent to Barwon Water's Northern Water plant which produces significant volumes of class a recycled water

This project aims to ensure recycled water from the plant can be provided to stead park through establishment of a recycled water use agreement and on site distribution infrastructure to facilitate its use.

STATUS	Not yet progressed; requires proposal from COGG
LEAD AGENCY	Barwon Water
LOCATION	Stead Park, Corio
TIMEFRAME	5-10 years
PARTNERS	
SCALE	Lot Scale

NEXT STEPS

- BW and CoGG will meet to discuss project and define actions that need to take place to progress and discuss financial model

Attachment 2 – IWM Stakeholders – responsbilities, legislation and strategies

Stakeholders	Responsibilities	Legislation	Strategies
Barwon Water	Provides safe, secure and affordable water services and outstanding customer and community value	Water Act 1989 Water Industry Act 1994 Statement of Obligations	Urban Water Strategy (March 2017) Strategy 2030
National Health and Medical Research Council (NHMRC)	Australia's leading expert body promoting the development and maintenance of public and individual health standards.	The Australian Drinking Water Guidelines (ADWG)	
Department of health	The Australian Government's main adviser on health, aged care, sport. They design, develop, implement and oversee policy and programs in these three areas.	Water Act 1989 Safe Drinking Water Act 2003	Health 2040 Victorian public health and wellbeing plan 2015–2019
EPA	Developing and overseeing compliance of environmental regulation to enable policy implementation that protects environmental health. Issuing of licenses for all scheduled premises and approvals and developing best practice guidelines.	Environment Protection Act 1970	Our Environment, Our Health
Local Governments	Provide waste management services (drainage and on-site domestic wastewater management compliance), natural resource and coastal management, environment conservation, parks and gardens, and land use regulation (urban planning and building and planning approvals).	Local Government Act 1989 Victorian Government (1987). Planning and Environment Act 1987 Local Government Act 1989 Local Government Bill 2018	Geelong Stormwater quality strategy 2015 Greater Geelong City Council, Neighbourhood Amenity Local Law 2014 Greater Geelong City Council (2006), Drainage Asset Management Plan.
CCMA	has responsibility for managing land and water resources and ensuring sustainable development of natural resource-based industries planning approval for connection to designated waterways	Planning and Environment Act 1987 Water Act 1989	Regional Catchment Strategy 2013-2019
Foreshore committees	manage coastal reserves throughout the municipality. It is common for urban areas to drain through these reserves and to impact on the beaches;		Coastal Management Plans
Southern Rural Water	Operates irrigation districts at Maffra, Bacchus Marsh and Werribee Manages seven major dams Licences groundwater users and river diverters across the southern half of Victoria	Water Act 1989 Statement of Obligations	Water Plan 3 2013-2018 Groundwater management rules and plans Rovers and Creeks management rules and plans
VicRoads	control and manage major transport corridors and road reservations		Toward Zero 2016-2020 Integrated Water Management Guidelines
Victorian Coastal Council	The Victorian Coastal Council (VCC) is appointed by the State Government of Victoria in accordance with the Coastal Management Act 1995.	Coastal Management Act 1995.	Victorian Coastal Strategy (2014)
Corangamite Catchment Management Authority	Regional waterway, floodplain, drainage and environmental water reserve management including the preparation, coordination and monitoring the implementation of regional catchment strategies	Catchment & Land Protection Act 1994	Corangamite Regional Catchment Strategy 2013 Corangamite Marine and Coastal Biodiversity Strategy 2009 Corangamite Landcare Support Plan 2013
DELWP	In partnership with government agencies, the Department manages public land, forests, water resources, catchments and waterways, and infrastructure.	State Environment Protection Policy (Waters of Victoria) Flora and Fauna Guarantee Act 1988 Coastal Management Act 1995 Wildlife Act 1975	Water for Victoria
Committees of management	Appointed under the Crown Land (Reserves) Act 1978, committees of management manage, improve and control allocated Crown land reserves. In Victoria, approximately 1,500 reserves are managed by 1,200 voluntary committees of management and 2,800 reserves are managed by municipal councils as committees of management.		

Regional Coastal Boards	The Western, Central and Gippsland Coastal Boards develop coastal action plans, provide advice on coastal development, prepare guidelines for coastal planning and management, facilitate the implementation of the Victorian Coastal Strategy, coastal action plans and guidelines, facilitate awareness and involvement in strategies, plans and guidelines, and encourage the cooperation of those involved in planning and management.		
Coast Care groups	Coast care groups undertake voluntary work to protect and enhance Victoria's 2,000 kilometres of coastline. Activities include revegetating coastal areas, building boardwalks and tracks, fencing, monitoring native shorebirds and animals, education and awareness raising, plantings, landscaping coastal areas and protecting cultural sites		
Parks Victoria	Parks Victoria is a statutory authority created by the Parks Victoria Act 1998 that reports to the minister. It manages the state's network of national, state, regional and metropolitan parks, other conservation reserves, and many significant cultural assets. Parks Victoria provides services for the management of waterways and land for the purposes of conservation, recreation, leisure, tourism or water transport, and for the management of land used for public purposes.		Shaping our Future
Regional Directorates		Catchment & Land Protection Act 1994 Conservation, Forests & Lands Act 1987 Land Act 1958 Crown Land (Reserves) Act 1978 Land Conservation Act 1970 Heritage Rivers Act 1992 Management Services Agreement Land (Reserves) Act 1978	
Traditional Owners - Wathaurong Aboriginal Corporation **Eastern Maar Aboriginal Corporation**	Conserve, protect and enhance natural and cultural heritage assets • Meet cultural heritage obligations • Supporting Participation Strategies for IWM planning, decision making and implementation involvement	Native Title Act 1993 Victorian Traditional Owner Settlement Act 2010	
The Department of Economic Development, Jobs, Transport and Resources (DEDJTR)	The Department of Economic Development, Jobs, Transport and Resources (DEDJTR) was established on 1 January 2015, bringing together many of the main areas that drive economic development and job creation in Victoria. These include transport and ports, investment attraction and facilitation, trade, innovation, regional development and small business, together with key services to sectors such as agriculture, the creative industries, resources and tourism.	Agricultural Industry Development Act 1990 Conservation, Forests and Lands Act 1987 Dairy Act 2000 Fisheries Act 1995 Flora and Fauna Guarantee Act 1988 Meat Industry Act 199	
Regional Development Victoria	Facilitate infrastructure and community development to improve the quality of life for regional Victoria.	Regional Development Victoria Act 2002	
Essential Services Commission	Economic regulation for water services and local government to facilitate efficient investment and pricing.		
Victorian Planning Authority	Undertake strategic planning and coordinated infrastructure for the future growth and transformation of Victoria's cities and regions – including our growing regional towns and cities.		

Attachment 3– Local Government Authority overview

Golden Plains Shire

Golden Plains Shire is situated between the cities of Geelong and Ballarat and has a population of over 20,000 people. The municipality encompasses an area of 2,073 square kilometres and has relatively low population density (6.9 persons per km2). Many residents rely upon employment and education facilities located in Greater Geelong or Ballarat. The majority of the land in the municipality is used for rural purposes (Golden Plains Shire Regional Profile).

Golden Plains Shire vision is focussed on promoting healthy and connected communities, enhancing local economies, managing natural and built environments and delivering good governance and leadership.

Population Growth - The Golden Plains Shire population forecast for 2018 is 22,859, and is forecast to grow to 32,449 by 2036 (.id). New residents, particularly young families, are attracted to the area's rural lifestyle, affordable housing and proximity to the services and jobs. The Visitor Economy is an important and underappreciated segment of the Golden Plains economy.

Visitors are not just tourists, they are friends and relatives visiting or staying with residents and others travelling through the Shire.

Climate Change - Climate change impacts on the Golden Plains shire include impacts of temperature rise and drought on inland and rural areas. Temperature rises will result in increased heat-related stress and mortality among aged and 'at risk' populations as well as a higher risk of bush fire. Drought will have impacts on water availability for recreational and open space and a growing agricultural sector.

Community needs and expectations - Golden Plains Shire has a strong commitment to health and wellbeing priorities including healthy eating and active living, access to local health and community services, healthy and sustainable environments and connected communities. Golden Plains has a low level of relative socio-economic disadvantage. While Bannockburn, the LGA's largest town, has a low level of disadvantage, most other townships have much higher levels including Smythesdale, Meredith, Enfield, Rokewood, Dereel and Linton (Golden Plains Regional Profile 2014).

Economy - Golden Plains offers many opportunities for businesses, investment, sustainable development and employment, with more than 1,700 businesses in farming, retail and home-based businesses. Intensive animal farming continues to increase and strengthen, with the production of goat dairy, beef, chicken and pork strong in Golden Plains, and marked growth in viticulture. The Golden Plains Food Production Precinct is growing and the region is beginning to be known for the gourmet food and wine experience that found in the southern end of the Shire (Golden Plains economic development strategy).

Opportunities

Town	IWM Opportunity	Status
Bannockburn	IWM Plan	Priority
Inverleigh	IWM Plan	Potential
Lethbridge	Golden Plains Food Precinct	In place
	IWM plan	Potential
Meredith	IWM Plan	Potential
Shelford	IWM Plan	Potential

Surf Coast Shire

The Surf Coast Shire is located to the south west of Geelong and Melbourne and encompasses an area of 1,560 square kilometres. The region is an appealing destination for holidaymakers and international visitors, or those looking to make a permanent sea change. The Shire is home to some of the world's best surfing locations and the iconic Great Ocean Road, with other important attractions including the Great Otway National Park, Bells Beach and Erskine Falls. Surf Coast Shire's vision is for 'an engaged, innovative and sustainable community' focussed around 5 key themes including community wellbeing, environmental leaderships, balancing growth, vibrant economy, high performing council.

Population growth - The Surf Coast Shire continues to be one of the fastest growing municipalities in Victoria, with the permanent population forecast to rise from 30,048 in 2017 to almost 44,000 by 2036 (forecast.id March 2017). The Surf Coast region received an estimated 2.1 million total visitors to the financial year ending June 2016. It received over 2.3 million overnight visitor nights during the same period. (SCS visitor insights) Visitors to the financial year ending June 2016. It received over 2.3 million overnight visitor nights during the same period. (SCS visitor insights)

Climate Change - Coastal inundation and erosion due to higher sea levels is a key risk for the Surf Coast Shire's built and natural environment. Temperature rise will result in increased heat-related stress and mortality among aged and 'at risk' populations as well as a higher risk of bush fire. Drought will have impacts on recreational and open space. Open spaces provide a number of urban eco-system services, including the reduction of effects from major storm events, including the significant reduction in the amount of water entering drains (as trees hold rainwater on their canopies and through transpiration). (SCS Open Space Strategy)

Community needs and expectations - The proven health and wellbeing benefits of the natural environment mean the Surf Coast Shire is well placed to achieve positive quality-of-life outcomes for its residents and visitors. The Shire is naturally built for good health and wellbeing due to its access to the Otways and beaches. With this advantage comes the associated risk of bushfire and potential mental stress, as well as the need to protect public open spaces and green belts as the population and dwelling numbers grow. The Surf Coast Shire has become one of the least disadvantaged municipalities in Victoria. Although wealthier people tend to be healthier, issues around work-life balance also pose a risk. Winchelsea is the township which has a high level of relative socioeconomic disadvantage (SurfCoast Shire Regional Profile 2014).

Economy - The Surf Coast economy is unique, dominated by surfing, tourism, construction and retail sectors. Traditional and emerging sectors of agriculture and health compliment to create a distinctly different economy to that of Geelong and surrounding regions. (SCS economic development strategy). Critical to achieving sustained economic growth is the unique natural surrounds which includes world famous beaches, pristine coastal areas and National Parks. These natural assets are a corner stone in attracting approximately 2 million visitors who expend over $500 million annually (SCS Economic_Snapshot_2016). Away from the coast, agricultural production in the Surf Coast Shire has developed niche markets in pork production (Otway Pork), as well as beef, wool, poultry and stock feed crops.

Opportunities

Town	IWM Opportunity	Status
Anglesea	Stormwater reuse - Foreshore camping ground	Potential
	Anglesea Futures IWM Plan	Potential
Torquay	Spring Creek IWM Plan	Potential
	Recycled Water from Black Rock to additional farming enterprises in the Thomson Valley (Hinterland Plan)	Potential
	Torquay Basin Subdivision	Potential
Lorne	Lorne IWM plan	Potential

Borough of Queenscliffe

The Borough of Queenscliffe is situated approximately 105 km southwest of Melbourne and 35 km east of Geelong and comprises the historic township of Queenscliff and the coastal settlement of Point Lonsdale (part of which is located within Greater Geelong). (G21)

The Borough of Queenscliffe's vision is focussed on Community Wellbeing, Environmental Sustainability, Local Economy, Planning and Heritage, Governance and Performance.

Population - In 2011, Queenscliff had a population of 3,100 and Victoria in Future* population projections for Queenscliff indicate a population decline or -0.2% between 2011 and 2021. The population is older than Victoria's average and fluctuates due to tourism

Attraction increasing over peak holiday periods (school holidays, long weekends). Over the peak tourist period the population of Queenscliff and Point Lonsdale townships increase by an estimated 316% and 383% respectively.

Climate Change - As a small coastal community surrounded by water on three sides, the Borough of Queenscliffe is particularly vulnerable to storm surges and sea level rise. Temperature rises will result in Increased heat-related stress and mortality among aged and 'at risk' populations. Drought will have impacts on water availability for recreational and open space and impacts on the natural environment. The need to protect and enhance the Borough's natural environment continues to be a high priority for Council as demonstrated through its Corporate Carbon Neutral Action Plan and the in-progress Community Carbon Neutral Action Plan.

Community needs and expectations - Queenscliffe has a much older population than the state average, with the median age of the usual resident population (55 years) and a much higher proportion of population aged 65 years and over. Residents rated their wellbeing at 84 out of 100, compared with the state average of 77.5. Queenscliffe has a very positive relative socio-economic level (Borough of Queenscliffe Regional Profile 2014).

Economy - The Borough of Queenscliffe is an attractive destination for tourists given the Queenscliff to Sorrento Ferry, unique Defence Force facilities, pristine natural environment and remarkable water views. Queenscliff's strong community and rich heritage are among its key strengths. It has comparatively expensive real estate and high income residents. Reflecting its position as the smallest local government area in Victoria, the Borough has a relatively small local economy. In December 2012, the total Gross Value Added (GVA) for Queenscliffe was estimated at $143.775 million. The major contributors to value-added were public administration and safety (26.1%), rental, hiring and real estate services (14.0%) and accommodation and food services (10.6%). (.id)

Opportunities

Town	IWM Opportunity	Status
BOQ	BOQ IWM Plan – localised flooding focus, stormwater reuse	Priority

Colac Otway Shire

Colac Otway Shire is located in regional Victoria and encompasses an area of 3,433 square kilometres. The Shire has rich landscape that takes in volcanic lakes, craters and plains in the north, the hinterland forests of the Otway Ranges and the Great Ocean Road coastline. Colac township is situated beside Lake Colac on the Princes Highway. The Shire has both a permanent population and is a tourism destination for holiday makers and international tourists.

The Shire's vision is 'towards a prosperous future' focussing on prosperity, our places, our community, our leadership and management.

Population growth - Recent years have seen very low levels of population growth in the Shire. The Colac Otway Shire population was 20,800 in 2011 and estimated to decline by - 0.4% between 2011 and 2021.

Climate Change - The Colac Otway Shire has two very different climate patterns in the future for the north and south, with the Otway Ranges influencing the south of the Shire. The greatest increase in temperature and drying will occur in the districts within and to the north of Colac where the most sensitive populations live. Coupled with this, the districts to the north east of Colac also have the highest economic and environmental sensitivities. The northern areas of the Shire (north of Lake Corangamite and Colac) will experience the greatest temperature increase. Northern areas of the Shire will be driest (north of Lake Corangamite and Colac) with the southern areas the wettest. Increased vulnerability of this in bushfire areas. Barham River in Apollo Bay will have the greatest exposure to inundation, which will impact the Great Ocean Road and the Apollo Bay Caravan Park. Wye river will also be impacted. (COS Climate adaptation plan).

Community needs and expectations -

Colac Otway Shire sustains a mixed population of tourists, businesses, farmers, retirees and families, some of whom settled in the Shire recently and some who can trace their families' history back to the original settlers. The Shire has a small population of aboriginal people.

The land of the Shire sustains different ways of living, from affordable housing options in the towns, to spectacular properties with views of the forest and the sea. Colac Otway is in the third (most disadvantaged) decile of Victorian LGAs, with the township of Colac among the most disadvantaged localities in Victoria (Colac Otway Shire Regional Profile 2014).

Economy - Colac Otway Shire's economy is based on agriculture, manufacturing, successful dairy and food processing and the timber industry and has a growing tourism industry built on the coastline of the Great Ocean Road and the forests of the Otways. There is a number of small, specialist food producers, many forming the Colac Otway food trail plus, a host of local retail businesses, arts and crafts enterprises; and health and education services. However, low employment has contributed to some seeking employment outside of the Shire and an increasingly ageing population. **Opportunities**

Town	IWM Opportunity	Status
Apollo Bay	Apollo Bay IWM Plan	Priority
Colac	Irrewillepe Stormwater Basin Upgrade	Priority
	Colac Botanic Gardens Stormwater	Potential
	Urban Forest Strategy	Potential
	Botanic Pathway and Green Spine	Potential
	Colac West Growth Area flood redevelopment	Potential
	Lake Colac Master Plan	Potential

City of Greater Geelong

Greater Geelong is located in regional Victoria, to the south west of the Melbourne metropolitan area and is the second largest city in Victoria. The municipality encompasses an area of 1,247 square kilometres in a mix of coastal, rural and urban communities. The coastline includes Corio Bay and coastal settlements from Portarlington to Breamlea.

The City of Greater Geelong is working toward a long term vision for 'a clever and creative region' focussing on 11 strategic priorities including improved health and safety of the community, informed social infrastructure and planning, a more inclusive and diverse community, planned sustainable development, effective environmental management

vibrant arts and culture, integrated transport connections, a thriving and sustainable economy, growing tourism and events, innovative finances and technology, organisational leadership, strategy and governance.

Population Growth- The City of Greater Geelong population was 215,800 in 2011 and is forecast to grow to 296,400 by 2031 (VIF 2016). Geelong has experienced strong population and housing growth in recent years and this is likely to continue. Numbers of overnight visitors to the Geelong region in 2014/15 was 1,169,000.

Climate Change -

Coastal inundation and erosion due to higher sea levels is a key risk for coastal areas within the Greater Geelong region. The region has approximately 750 residential buildings that lie within 110 metres of 'soft' erodible shorelines and a large number of coastal caravan parks along the Bellarine peninsula would also be affected by sea level rise.

Many industrial sites are close to the shoreline and are contaminated. Pollutants on these sites may leach into the sea, with potentially harmful impacts. Floods may also spread contaminants beyond the borders of industrial sites, into more areas with sensitive uses. Floods may also cause pressure on stormwater systems.

Temperature rise will result in increased heat-related stress and mortality among aged and 'at risk' populations as well as a higher risk of bush fire. Breamlea and Anakie have been assessed as having extreme bushfire risk; while St Leonards / Indented Head has been assessed as having very high risk and Lara and Ocean Grove as having high risk. (Climate Adaptation Plan CoGG. Drought will have impacts on recreational and open space areas requiring extensive irrigation to maintain.

Community needs and expectations - Compared to state average figures, the Greater Geelong population had a higher subjective wellbeing score (78.6% versus 77.7%) but was less likely to report their health as good or excellent (45.1% versus 46.6%). Areas of poor socio-economic levels are focussed in the north and south east of the Geelong urban area plus in the far east of the municipality in Indented Head, St Leonards and Portarlington. Locations with most positive socio-economic levels are focused along the southern coastal edge of the municipality. Some of Greater Geelong's suburbs are among the most disadvantaged of Victorian state suburbs, including Bell Park, Corio, Norlane, St Leonards, Thomson and Whittington (CoGG Regional Profile 2014)

.**Economy** - The bulk of economic, employment and output growth in the Barwon Region will largely be focused in and around Geelong. The largest sub-region by both population and economic activity, the City of Greater Geelong is the business and industry heart of the Barwon Region and houses the majority of the workforce. The City of Greater Geelong also has significant strategic assets such as the CSIRO research facility, a large medical precinct including ST JOG, Epworth and University Hospitals, Deakin University and the Gordon Institute of TAFE. Geelong's manufacturing history and transition into advanced manufacturing techniques demonstrates the city is capable of complex production methods, with highly skilled staff. (G21 Regional Profile 2014). Geelong has

a broad economic base with major strengths in health and allied services, education and research, advanced manufacturing, tourism, agribusiness, construction and professional services. (www.economyprofile.com.au). The City of Greater Geelong is in turn needing to meet housing needs of a growing workforce and associated supporting infrastructure.

Opportunities

Town	IWM Opportunity	Status
Armstrong Creek	Duneed Reserve Pump Station and Aboriginal Heritage Values opportunity	In progress
Drysdale	Drysdale Sporting precinct Reuse & water rehabilitation	Potential
Geelong	Johnston's Park Raingarden	In progress
	Barwon River Parklands	Potential
	Re-activation of urban waterways	Potential
	Northern Geelong Growth Area IWM Plan	In progress
	Western Geelong Growth Area IWM Plan	In progress
	Greening Central Geelong	In progress
	Malop Street Green Spine	In progress
	Stead Park Recycled Water	Potential
Lara	Stormwater reuse; GREP to Lara Views	Potential
	Lara Flood Study	Potential
	Avalon IWM Plan	Potential
Ocean Grove	New developments in Kingston and Oakdene	Potential