ALBERT PARK INTEGRATED WATER MANAGEMENT PLAN

City of Warrnambool

Prepared for Warrnambool City Council

01 EXECUTIVE SUMMARY

The Albert Park Integrated Water Management (IWM) Plan builds on the IWM Framework for Victoria (DELWP, August 2017) by investigating and identifying opportunities to implement IWM measures within Albert Park. The IWM Plan has been developed with reference to the following strategic documents:

- Warrnambool City Council Plan 2017-2021
- Green Warrnambool 2018
- Great South Coast IWM Forum
- Warrnambool Drainage Study Investigation
- Quarry Redevelopment Masterplan

A shared vision of the Albert Park IWM was developed in consultation with stakeholders during a workshop held with users of Albert Park in January 2019. The vision for the Albert Park IWM Plan is "A leading recreation reserve demonstrating a water sensitive approach that supports facilities and enhances the natural environment and community understanding of the value of water."

The objectives of the Albert Park IWM Plan are to:

- Reduce demand on potable supply
- Reduce stormwater discharge to Russells Creek
- Reduce stormwater and groundwater pollution
- Increase urban greening and biodiversity
- Improve the open space and other community amenities of the precinct through IWM, and
- Support broader community awareness and education about where our water comes from and associated impacts.

A range of IWM opportunities have been proposed to increase infiltration through infrastructure and water reuse, as well as, softer measures such as education and increased vegetation. The opportunities were identified through the stakeholder workshop and broadly include:

- Raingardens, wetlands, and soak pits
- Rainwater tanks
- Flood management
- Education and information through programs and signage
- Urban greening
- Vegetation to create biolinks with Russells Creek

The Albert Park IWM Plan has been developed in collaboration with the following stakeholders:

- Warrnambool City Council
- Wannon Water
- Eastern Maar
- Department of Environment, Land, Water and Planning (DELWP)
- Albert Park Users

Issue Date	Rev No	Authors	Checked	Approved
17/04/2019	1	J. Veary	J. Ward	M. Yule
28/06/2019	2	J. Veary	M. Yule	M. Yule
04/07/2019	3	J. Veary	A. Brown	M. Yule
21/08/2019	4	J. Veary	M. Yule	M. Yule
30/10/2019	5	J. Veary	M. Yule	M. Yule
14/11/2019	6	J. Veary	M. Yule	M. Yule

Spiire job number: 306133

Version 4 Date: August 2019

02
SITE DESCRIPTION

Albert Park is located within the city centre of Warrnambool. The 60ha park is a highly valued open space by the local community. The Albert Park Precinct is a hub for community activities, including several sporting clubs, the Warrnambool Community Garden, Warrnambool College and Warrnambool City Memorial Bowls Club. Additionally, the Wannon Water treatment plant for the town's water supply is located within the park.

The key constraint to Water Sensitive Urban Design (WSUD) is the topography of the park, with the park being located at the top of the catchment flowing towards Russells Creek. However, IWM is broader than WSUD, as a result, the initiatives documented in this report focus on infiltration, potable water substitution and urban greening.

A GHD Geophysical Survey Report (March 2013) on the Warrnambool Albert Park Water Treatment Plant gives detail on the geophysical properties of Albert Park, including the saturation abilities of the subsurface layers. Water infiltrated from Albert Park appears to flow towards Warrnambool Racecourse and ultimately Russells Creek. It is acknowledged that the groundwater infiltrated within Albert Park does not reach the Port Campbell Limestone Aquifer.

EXISTING IWM INITIATIVES

Below are the IWM measures currently in place within Albert Park.

- Rainwater tanks have been installed on several buildings within Warrnambool College. Tank water is currently being used for toilet flushing
- An infiltration wetland is located south of Reid Oval. This wetland takes flows from the surrounding Albert Park catchment as well as neighbouring residential areas. The flows entering this system ultimately infiltrate into the ground.
- A soak pit located in the carpark behind the bowls club
- Two soak pits have been installed at Warrnambool College taking flows from the bus turn around.
- Smart meters have been installed in Warrnambool College, allowing the college to easily track their potable water usage.

FIGURE 1: ALBERT PARK SITE LOCATION

03

VISION AND OBJECTIVES

VISION

SELF-SUFFICIENT | CONNECTING THE COMMUNITY | EDUCATIVE

The overall vision for the Albert Park IWM Plan is:

"A leading recreation reserve demonstrating a water sensitive approach that supports facilities and enhances the natural environment and community understanding of the value of water."

OBJECTIVES

Objectives for the Albert Park IWM Plan include:

- Increase use of alternative water supply to reduce impact on cost and environment
- Reduce stormwater discharge to Russells Creek
- Reduce stormwater and ground water pollution
- Increase in urban greening and biodiversity
- Improve the open space and other community amenities of the precinct through IWM, and
- Support broader community awareness and education about where our water comes from and associated impacts

The Albert Park IWM Plan objectives have been developed to align with the principles in DELWP's IWM Framework for Victoria as well as the Great South Coast IWM Forum. The DELWP IWM Framework principles are presented on the right of this page.

The Great South Coast Forum is a collaboration between Councils and Authorities in the region. The goal of the forum is to identify collaborative IWM opportunities that can improve resilience and liveability in cities and towns in the region. The Albert Park IWM Plan was one of the priority IWM opportunities identified as a part of this forum.

IWM OPTIONS DEVELOPMENT

A range of IWM opportunities were developed by the stakeholders, Warrnambool City Council and Wannon Water. The options included a number of infrastructure opportunities to promote WSUD, infiltration and water reuse.

A range of soft measures were also presented including urban greening and raising community awareness of water through education.

The IWM site specific options are presented in Sections 6-8.

Current and proposed conceptual water balances have been constructed and are presented in Sections 4 and 9.

ENGAGEMENT

The Albert Park IWM Plan was developed in collaboration with Warrnambool City Council, Wannon Water, and several other stakeholders of the park. The plan was developed through a stakeholder workshop, focusing on:

- Vision and opportunities, and
- Options identification and prioritisation

Representation from the following organisations were involved with development of this plan:

- Warrnambool City Council
- Wannon Water
- Department of Environment, Land, Water and Planning
- Eastern Maar Aboriginal Corporation
- Southern Rural Water
- Warrnambool College
- Warrnambool Community Garden
- East Warrnambool Football Netball Club
- City Memorial Bowls Club
- Russells Creek Football Club
- Warrnambool Pony Club
- Warrnambool Football Netball Club
- Warrnambool District Hockey Association
- South Rovers Football Netball Club
- Glenelg Hopkins Catchment Management Authority
- genU representative
- Park Users representative

SAFE, SECURE AND AFFORDABLE SUPPLIES IN AN UNCERTAIN FUTURE

- A diverse range of water supplies and sources
- Water quality meets regulatory standards and community expectations
- Manage water efficiency and demand
- Secure water supply for Victorian industry and the economy
- Water available to maintain valued green community assets including for climate change

EFFECTIVE AND AFFORDABLE WASTEWATER SYSTEMS

- Meets public health and environmental standards
- Optimised onsite domestic wastewater
- Effective sewerage systems
- Maximise waste-to-resource opportunities

EFFECTIVE STORMWATER MANAGEMENT PROTECTS OUR URBAN ENVIRONMENT

- Waterway health is maintained and improved
- Appropriate levels of flood protection in new development
- Community and property resilient to local flood risk

HEALTHY AND VALUED URBAN LANDSCAPES

- Water is prominent in the urban landscape
- Urban landscapes retain moisture for cooler, greener cities and towns
- Waterways accessible as valuable open space
- Aboriginal cultural values associated with waterways are protected

COMMUNITY VALUES REFLECTED IN PLACE BASED PLANNING

- Diverse urban landscapes that reflect local conditions and community values
- Local water related risks and issues
- Empowered engaged community understood and managed

04
WATER BALANCE: CURRENT

WATER BALANCE

A conceptual water cycle was developed for the purpose of establishing the various routes that water moves in and out of Albert Park. A base case water balance was generated, presenting the estimated annual volumes of water entering and leaving the site. The water balance, shown in Figure 2 includes the southern external residential catchment that outlets into Albert Park.

The following elements were quantified as a part of the water balance model:

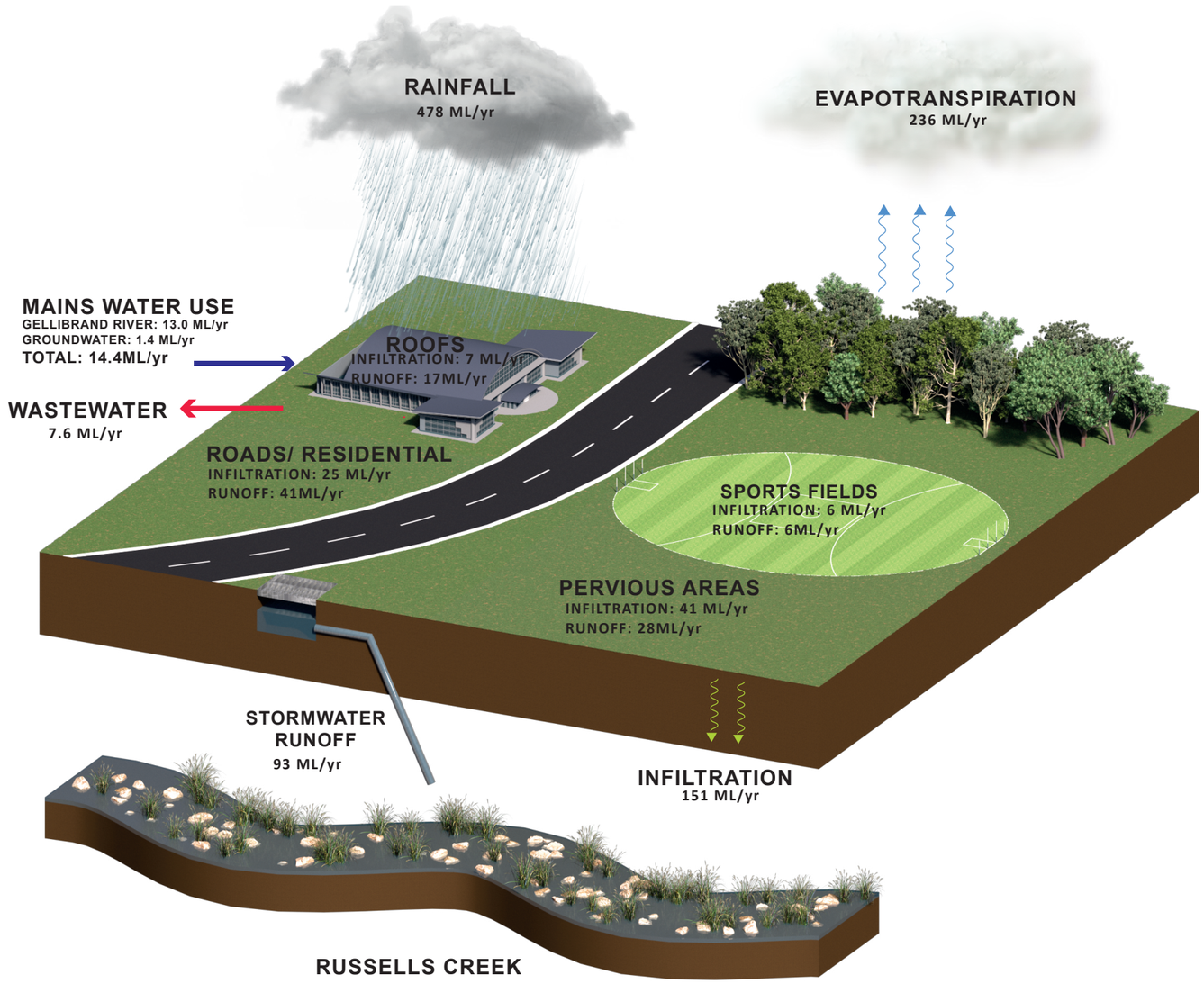
- Stormwater generated within and upstream of Albert Park
- Stormwater exiting the site via runoff, infiltration and evapotranspiration
- Pollutant loads associated with stormwater generated, and
- Potable water used within the precinct.

MAJOR WATER USERS AND SEASONAL VARIATIONS

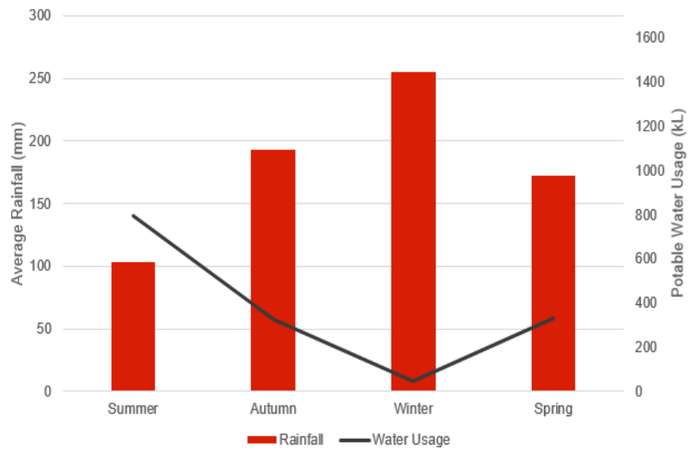
To better understand Albert Park's water use, seasonal water usage averages of the three major water users were compared. This analysis was used to identify any seasonality between inputs and outputs. Due to the limit of information available, this analysis only considers potable water and does not include alternative water sources, such as direct groundwater or rainwater use.

The analysis shows that the Warrnambool Community Garden uses a large volume of water in summer, compared to the other seasons. While the other two major water users have a more constant use throughout the year.

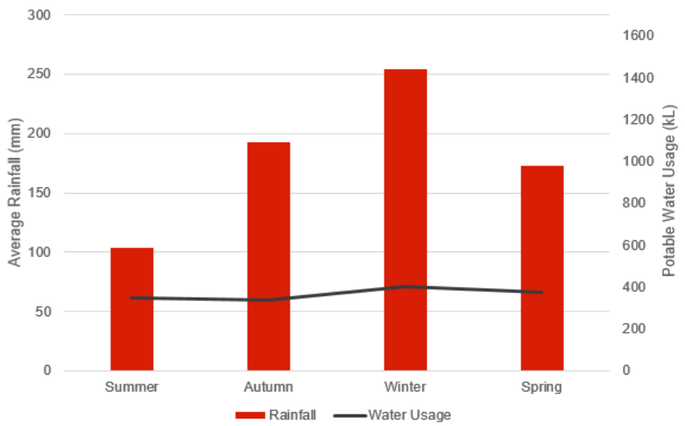
FIGURE 2: CURRENT WATER BALANCE FOR ALBERT PARK



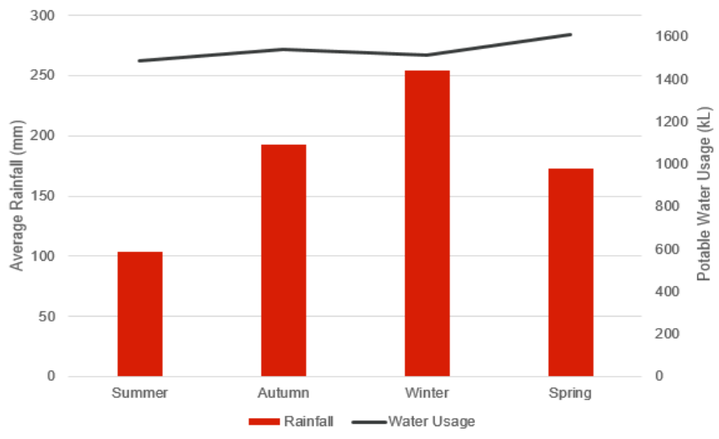
WARRNAMBOOL COMMUNITY GARDEN



FOOTBALL CLUB



WARRNAMBOOL COLLEGE



05
IWM
OPPORTUNITIES

IWM covers a wide range of water initiatives focusing around stormwater, wastewater, and water supply. The key opportunities considered in this project are described below.

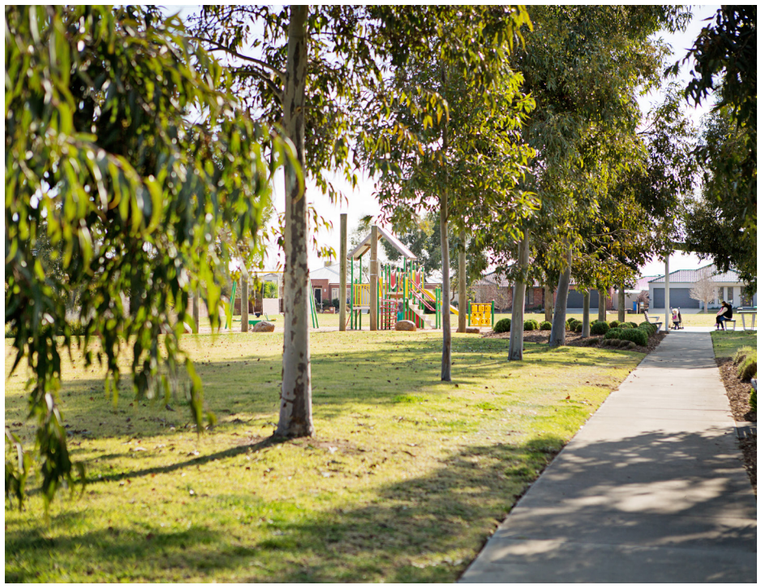
EDUCATION AND AMENITY

BENEFITS

- Connect the community to the landscape, cultural values and biodiversity
- Bring water to the surface
- Promote health and wellbeing through connecting with environment
- Support the broader community awareness and appreciation about where our water comes from and the impacts

HOW IT APPLIES TO ALBERT PARK

Due to the large presence of community activities, as well as Warrnambool College and Warrnambool Community Garden, Albert Park is an ideal place to increase community awareness and education of the water cycle.



URBAN GREENING

BENEFITS

Increase tree canopy and other vegetation in order to:

- Increase cooling
- Mitigate the urban heat island effect
- Improve amenity
- Improve air quality
- Create wildlife habitat
- Intercept stormwater runoff

HOW IT APPLIES TO ALBERT PARK

Due to Albert Park's location in the centre of the City of Warrnambool, increasing vegetation can increase biodiversity, create a biolink to Russells Creek and enable the many benefits of urban greening.

WATER SENSITIVE URBAN DESIGN

BENEFITS

- Reduce pollutant loads from stormwater entering waterways and aquifers
- Bring water to the surface to enable the community's visual connection to the water cycle

HOW IT APPLIES TO ALBERT PARK

Due to the lack of formal water sensitive urban design in the park, creating these assets will contribute to reducing pollutant loads entering Russells Creek. The availability of space within Albert Park also adds to the potential addition of these assets within the park.

It is acknowledged, proper design of these assets will be required to ensure no contamination of groundwater occurs.

05
IWM
OPPORTUNITIES

A number of IWM opportunities were identified to be considered as a part of the Albert Park IWM, including:

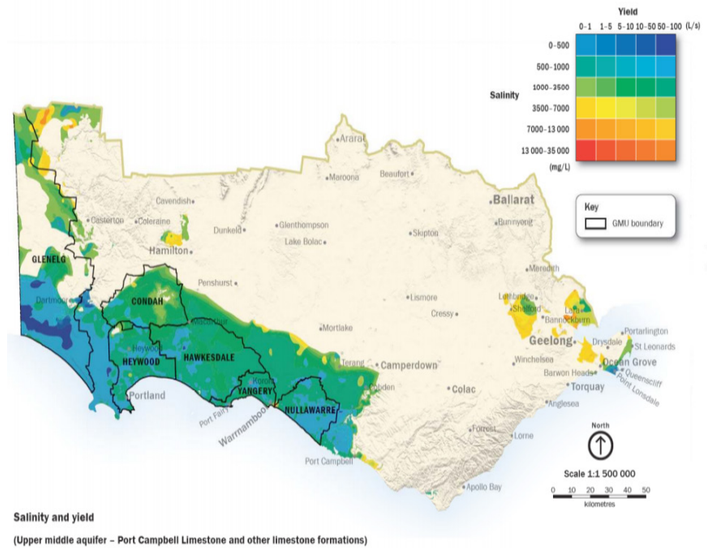
STORMWATER AND ROOFWATER HARVESTING

BENEFITS

- Reduce demand on potable supply
- Harvest stormwater for irrigation, toilet flushing, irrigation
- Reduce stormwater discharge to Russells Creek

HOW IT APPLIES TO ALBERT PARK

Due to Albert Park's high usage of potable water for irrigation and facilities, as well as large roof sizes, presents an opportunity to incorporate rainwater and stormwater harvesting within the park including a potential option for a centralised rainwater harvesting system. This opportunity also contributes to the vision of supporting the facilities through water sensitive urban design.



Source: South West Victoria, Groundwater Atlas, Southern Rural Water, 2011)

DIRECT INFILTRATION

BENEFITS

- Provide environmental benefit
- Provide natural treatment
- Reduce stormwater discharge to Russells Creek

HOW IT APPLIES TO ALBERT PARK

Albert Park's highly porous soils create an environment with a high infiltration rate, presenting an opportunity to provide natural treatment as well as reducing stormwater discharge to Russells Creek.

06
IWM OPPORTUNITIES IN ALBERT PARK

KEY AREAS

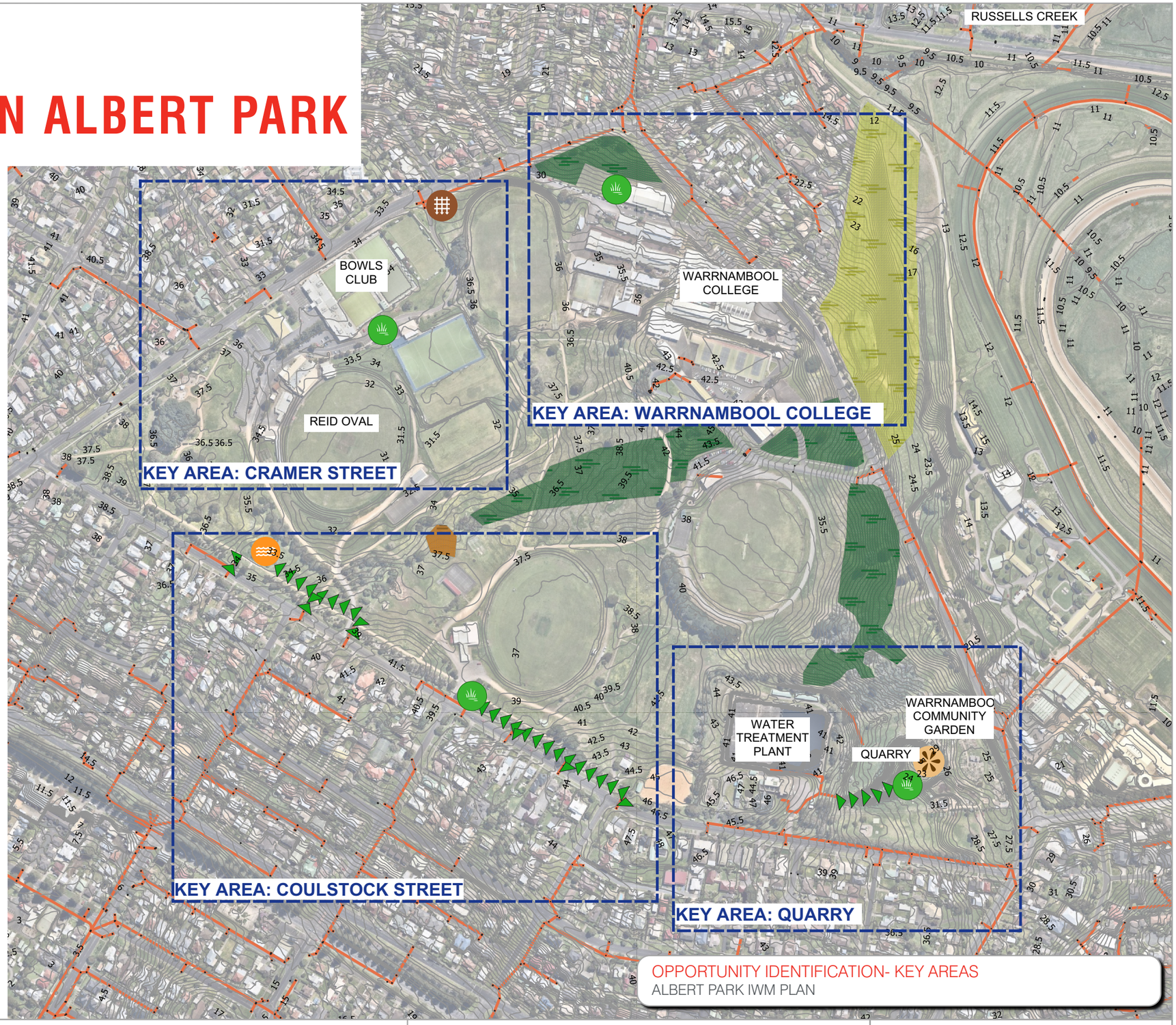
Based on the Opportunity Identification workshop, four key areas were identified where IWM measures may have a significant impact on Albert Park's water balance. The four areas include:

- Cramer Street
- Coulstock Street
- The Quarry
- Warrnambool College

The information and assessment of the different opportunities within these areas are supported by the previously documented Warrnambool Drainage Study Investigation (Water Technology, 2018) and the Quarry Redevelopment Masterplan (Perry Mills, 2017).

As a part of the Warrnambool Drainage Study Investigation, flooding hotspots were identified around Albert Park. Investigations on flood mitigation to these hotspots were incorporated and are presented in each key area.

In addition to the key areas identified urban greening, rainwater tanks, and education opportunities were proposed throughout the park.



OPPORTUNITY IDENTIFICATION- KEY AREAS
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 01
Rev: B
Date: 22.08.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Existing Drainage
- Existing Native Kangaroo Grass
- Proposed Biolink/Native Vegetation
- Swale
- Rainwater Tank on Buildings
- Soak Pit
- Wetland
- Raingarden
- Groundwater Bore

1:5250

50 0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 54
Paper size A3 Landscape

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06.1
IWM OPPORTUNITIES IN ALBERT PARK - CRAMER STREET

DRIVERS

The Cramer Street area has been identified as a key area for IWM due to the canopy over the bowls courts and the large car park. Additionally, as a part of the Warrnambool Drainage Study Investigation, McConnell Street and Birdwood Avenue were identified as a flooding hotspot.

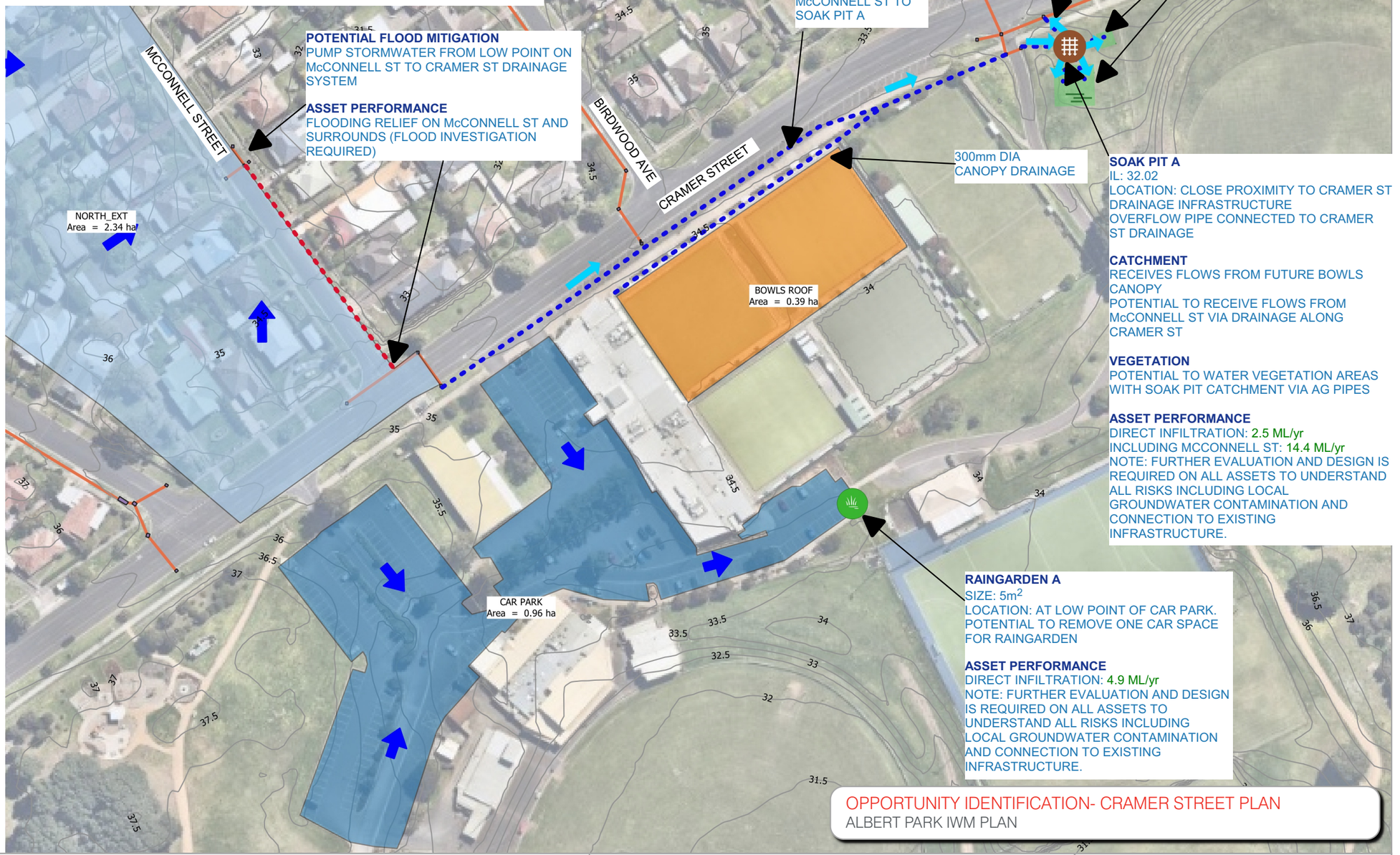
PROPOSED ASSETS

Soak Pit A is proposed to receive flows from the existing Bowls Roof canopy, which will provide a water source for vegetation areas as well as infiltration.

Raingarden A is proposed to receive flows from the car park for treatment prior to infiltration into the current soak pit. This asset will provide a formal water sensitive urban design asset with increased urban greening and can be used as a demonstration project for the park.

OPPORTUNITY FOR FLOOD MITIGATION

The McConnell Street flooding may be mitigated by pumping flows from the McConnell Street low point to drainage along Cramer Street. This option would increase the flows entering Soak Pit A. The effectiveness of this option would depend on the levels of McConnell Street and the Cramer Street underground drainage. As a result, it is recommended that further survey and flood modelling of this solution is undertaken to determine the validity of the flood solution. If this option reduces the peak flood impact on McConnell Street and Birdwood Avenue, this catchment can provide additional water for infiltration in the soak pit.



OPPORTUNITY IDENTIFICATION- CRAMER STREET PLAN
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 02
Rev: B
Date: 29.10.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Existing Drainage
- Drainage_Pits
- Vegetation
- Proposed Drainage
- Pumping Required
- Raingarden
- Soak Pit
- Direction of Overland Flow
- Direction of Drainage
- Catchments

1:1500

15 0 15 30 45 m

Coordinate System: GDA 1994 MGA Zone 54
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06.2
IWM OPPORTUNITIES IN ALBERT PARK - COULSTOCK STREET

DRIVERS

The Coulstock Street area has been identified as a key area for IWM due to the several external residential catchments discharging into Albert Park as well as an opportunity to upgrade existing informal infiltration areas within Albert Park. A flooding hotspot was also identified along Japan Street in the Warrnambool Drainage Study Investigation.

PROPOSED ASSETS

Two assets are proposed in this area. These assets will treat and infiltrate the flows from the external residential area discharging into Albert Park.

Wetland A was a key asset proposed in the opportunities identification workshop. Having a permanent water body will aid in connecting the community to water as well as the potential to attract wildlife. Educational signage is proposed to increase the community's awareness and appreciation of the water cycle.

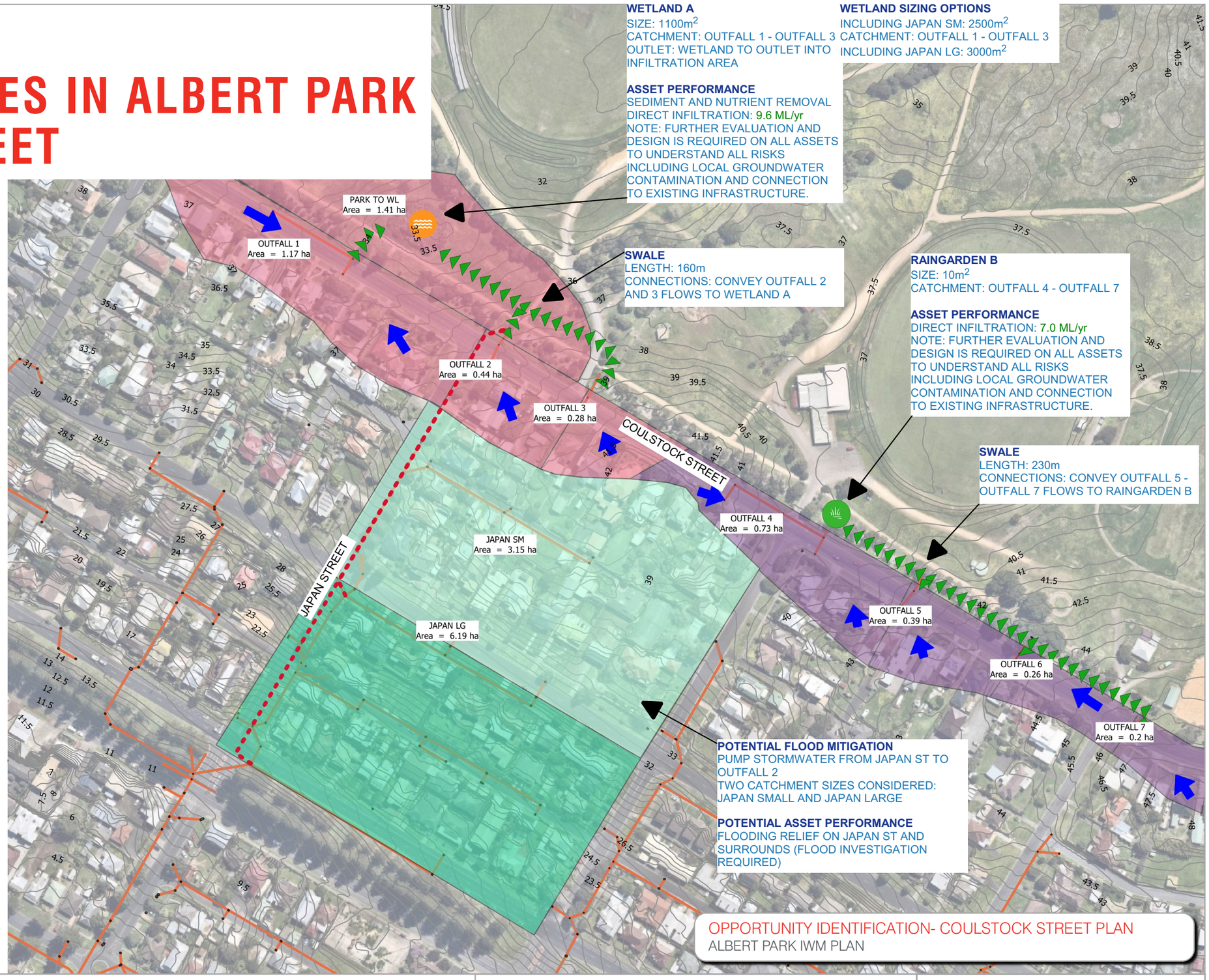
Raingarden B will also provide increased urban greening and improve on the currant infiltration of these flows.

OPPORTUNITY FOR FLOOD MITIGATION

Pumping runoff from a portion of the Japan Street catchment to Wetland A for treatment and infiltration has the potential to provide a flood mitigation solution. Two catchments were modelled to estimate the appropriate size wetland for each scenario.

The additional runoff will provide benefits to Albert Park through the wetland creating a more prominent feature within the park. This asset will also provide greater infiltration, as the wetland outfalls into an infiltration area, or the water for potential irrigation use.

Diverting this catchment, via pumping can potentially provide relief for the flood prone holiday park and surrounding areas within Japan Street. Further investigation and modelling would be required to optimise the catchment diverted and understand the impact of this option on the local flood immunity.



OPPORTUNITY IDENTIFICATION- COULSTOCK STREET PLAN
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 03
Rev: B
Date: 29.10.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Existing Drainage
- Drainage_Pits
- Contours
- Swale
- Proposed Drainage
- Pumping required
- Wetland
- Raingarden
- Catchments
- Direction of Overland Flow

1:2500

10 0 10 20 30 m

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06.3
IWM OPPORTUNITIES IN ALBERT PARK - QUARRY

DRIVERS

This area has been identified as a key area for IWM due to the large roof area of the water treatment plant, the water demand by the Warrnambool Community Garden, and the interest by the Warrnambool Community Garden to incorporate water features within their Quarry Redevelopment.

RAINWATER TANK

A rainwater tank is proposed to be implemented to capture the roof runoff from the water treatment plant (WTP) and used for irrigation in the Warrnambool Community Garden. The proposed location of this asset is at the north-eastern corner of the water treatment plant, as this is where the roof runoff currently drains to.

A seasonal variation analysis was conducted to determine the percentage of the summer water demand that can be supplied by the roof runoff. In the summer months it is estimated that the roof runoff can supply 55% of the Warrnambool Community Garden water demand. This is illustrated in the adjacent graph. For additional water supply, a groundwater bore is proposed to be installed at the base of the Quarry, with solar powered pumps to extract and distribute the water.

RAINGARDEN

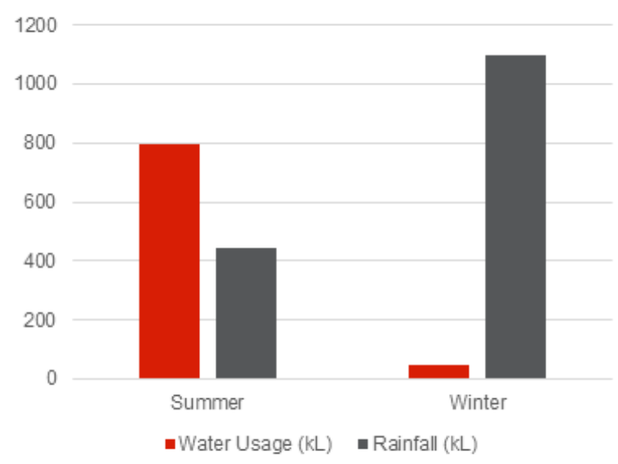
As an additional measure, a raingarden is proposed within the Quarry, capturing runoff from the surrounding area falling toward the Quarry and overflow from the rainwater tank catchment. This asset will treat and infiltrate runoff from these catchments.

Furthermore, this asset will increase urban greening, as well as create an asset within the Warrnambool Community Garden for education and amenity.

OPPORTUNITY FOR CATCHMENT INCREASE

An additional catchment along Coulstock Street is proposed to be diverted into the Quarry for the purpose of increasing the volume of water feeding into Quarry. Appropriate sized raingardens were modelled for each catchment size.

SEASONAL WATER DEMAND ANALYSIS



OPPORTUNITY IDENTIFICATION- QUARRY PLAN
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 04
Rev: B
Date: 29.10.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Existing Drainage
- Existing Drainage Pits
- Swale
- Proposed Drainage
- Catchments
- Rainwater Tank
- Raingarden
- Groundwater Bore
- Direction of Overland Flow
- Direction of Drainage

1:1500

10 0 10 20 30 m

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06.4
IWM OPPORTUNITIES IN ALBERT PARK - WARRNAMBOOL COLLEGE

DRIVERS

Warrnambool College has been identified as a key area for IWM measures due to the large amount of impervious surfaces (roofs and car parks). Furthermore, Warrnambool College has expressed their interest in implementing raingardens and/or rainwater tanks, as well as partnering with Warrnambool City Council and Wannon Water in developing a water education program, which can be incorporated in their curriculum. For more information on the education program refer to Section 9.

EXISTING ASSETS

Warrnambool College has several existing rainwater tanks connected to roofs within Warrnambool College (shown in pink). The rainwater from these tanks is used for toilet flushing.

PROPOSED ASSETS

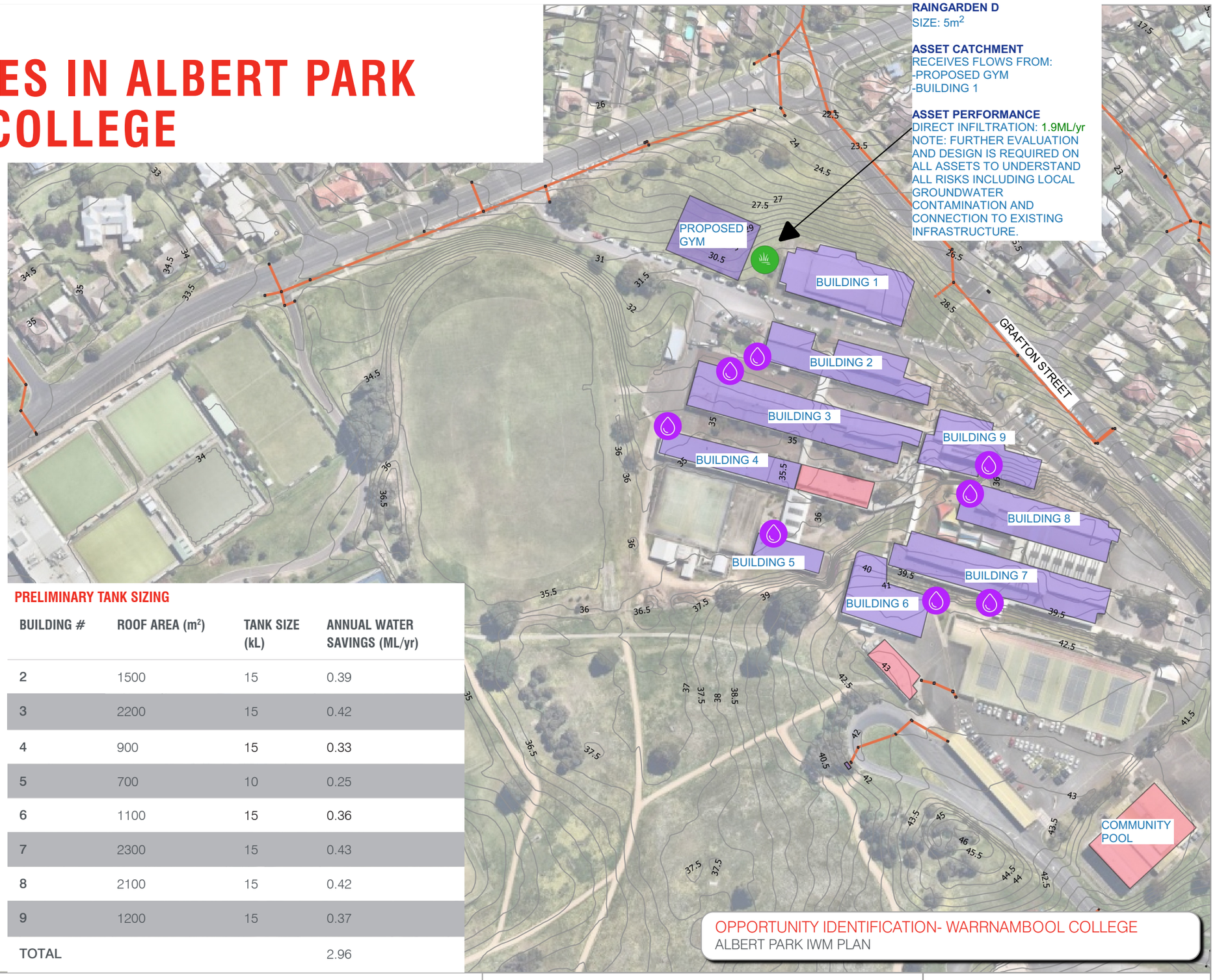
Numerous rainwater tanks are proposed across Warrnambool College. Potential uses for the rainwater include toilet flushing, irrigation and for washing the buses. Water savings as well as tank size have been calculated, however this is an estimate and should be further investigated when implementing each rainwater tank, based on actual roof areas contributing to the tank and an understanding of water use and required quality.

Due to the large amounts of impervious area around the college there is a potential to install several raingardens subject to funding. A pilot raingarden is proposed to infiltrate roof runoff from the proposed gym, as well as Building 1 during construction of the gym.

FUTURE OPPORTUNITIES

Based on the performance of the pilot raingarden (Raingarden C) there is potential to investigate installation of more raingardens around Warrnambool College to increase infiltration.

An additional potential opportunity for the future includes reusing the backwash water from the community pools. This opportunity would involve investigating the quality of the backwash water and the treatment required to provide fit for purpose water for reuse opportunities, such as oval irrigation.



PRELIMINARY TANK SIZING

BUILDING #	ROOF AREA (m²)	TANK SIZE (kL)	ANNUAL WATER SAVINGS (ML/yr)
2	1500	15	0.39
3	2200	15	0.42
4	900	15	0.33
5	700	10	0.25
6	1100	15	0.36
7	2300	15	0.43
8	2100	15	0.42
9	1200	15	0.37
TOTAL			2.96

OPPORTUNITY IDENTIFICATION- WARRNAMBOOL COLLEGE
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 05
Rev: B
Date: 29.10.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Existing Drainage
- Roof Catchment to Existing Rainwater Tank
- Roof Catchments to Proposed Rainwater Tank
- Rainwater Tank
- Raingarden

1:2000

15 0 15 30 45 m

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07.1
IWM OPPORTUNITIES IN ALBERT PARK - CENTRALISED ROOF WATER HARVESTING

This Roof Water Harvesting Study has been developed by Wannon Water.

DRIVERS

Currently Warrnambool's potable water supply is sourced from the Otway Ranges, requiring water to be pumped over 90km to reach the Brierly Basin raw water storage. Wannon Water has successfully implemented their centralised roof water harvesting scheme in suitable new residential developments north east of the basin. The buildings at the northern end of Albert Park have large roof areas, are a short distance from Brierly Basin and can be gravity fed to the basin. This presents an opportunity to retrofit centralised roof water harvesting to these buildings. These roofs are currently discharging to stormwater adding to flood issues Russel's Creek and the clubs and school are keen to facilitate a better outcome for re-use of the roof water.

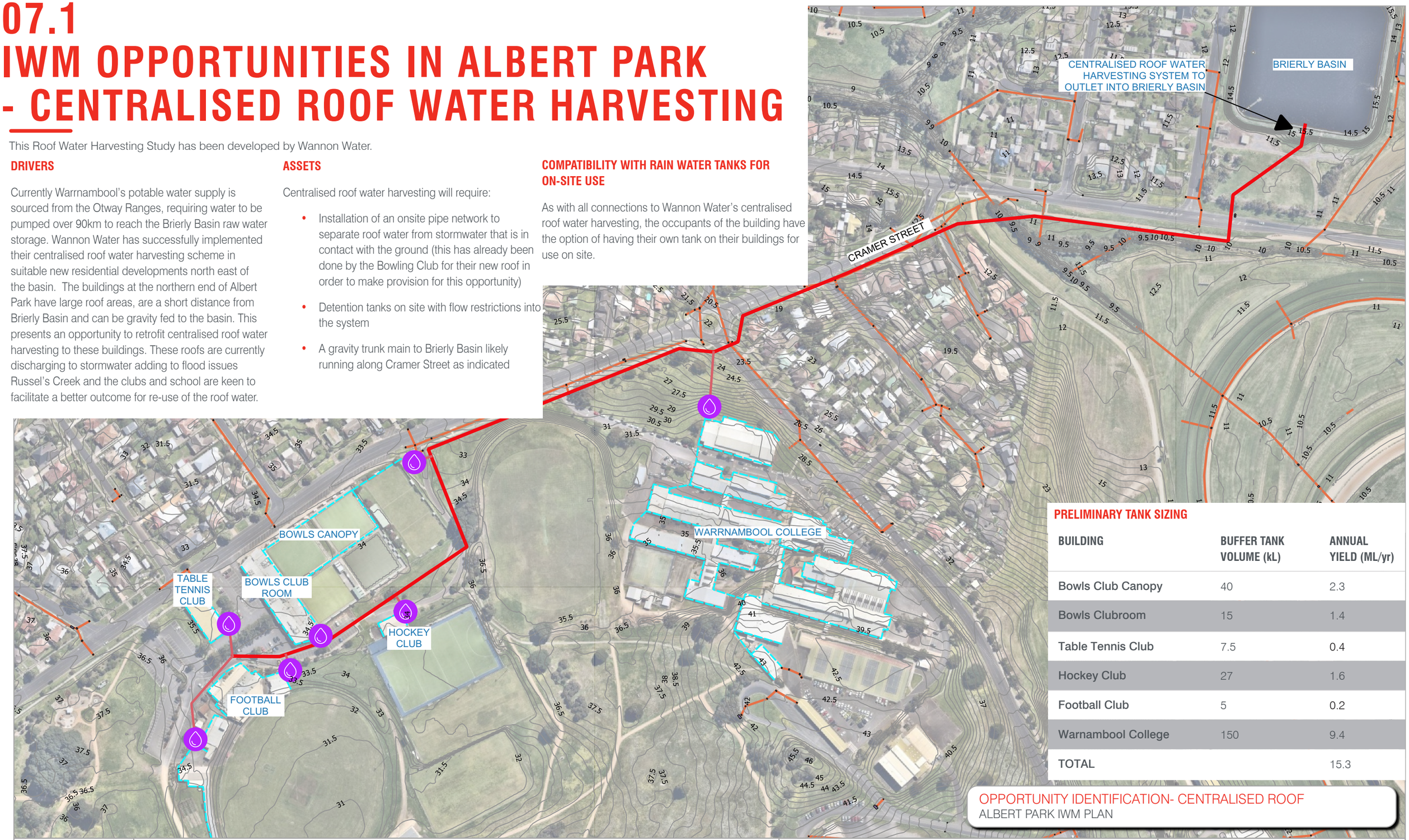
ASSETS

Centralised roof water harvesting will require:

- Installation of an onsite pipe network to separate roof water from stormwater that is in contact with the ground (this has already been done by the Bowling Club for their new roof in order to make provision for this opportunity)
- Detention tanks on site with flow restrictions into the system
- A gravity trunk main to Brierly Basin likely running along Cramer Street as indicated

COMPATIBILITY WITH RAIN WATER TANKS FOR ON-SITE USE

As with all connections to Wannon Water's centralised roof water harvesting, the occupants of the building have the option of having their own tank on their buildings for use on site.



PRELIMINARY TANK SIZING

BUILDING	BUFFER TANK VOLUME (kL)	ANNUAL YIELD (ML/yr)
Bowls Club Canopy	40	2.3
Bowls Clubroom	15	1.4
Table Tennis Club	7.5	0.4
Hockey Club	27	1.6
Football Club	5	0.2
Warnambool College	150	9.4
TOTAL		15.3

OPPORTUNITY IDENTIFICATION- CENTRALISED ROOF
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 05
Rev: E
Date: 31.10.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Existing Drainage
- Roof Drainage Network
- Trunk Main
- Transfer Pipe
- Detention Tank

1:3000

15 0 15 30 45 m

Coordinate System: GDA 1994 MGA Zone 54
Paper size A3 Landscape

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07.2
IWM OPPORTUNITIES IN ALBERT PARK - RAINWATER TANKS AND WATER METERS

RAINWATER TANKS

As an alternative option to the centralised roof water harvesting opportunity developed by Wannon Water, capturing roof runoff and utilising the water within Albert Park for uses such as irrigation or toilets, rather than connecting to the larger system was also investigated. Appropriate tank sizes for each building have been identified based on roof area and estimated uses. For information on the Warrnambool College proposed rainwater tanks refer to Section 6.4 of this IWM plan.

These rainwater tanks have the potential to significantly reduce the potable water usage within Albert Park. Water savings as well as tank size have been calculated however this is an estimate and should be further investigated when implementing each rainwater tank.

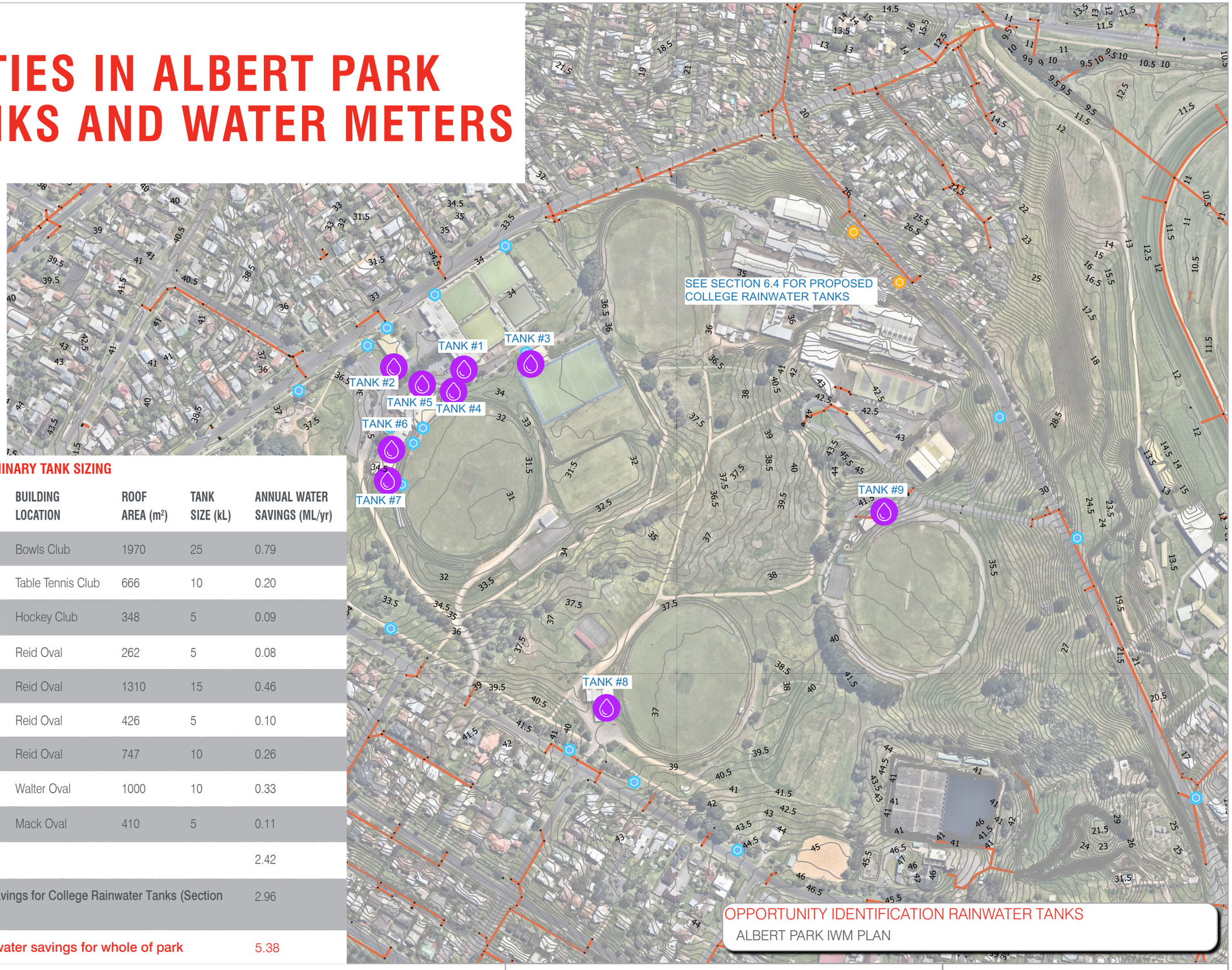
WATER METERS

Water usage within the park was determined based on the numerous water meters within the site. Water usage within each organisation was able to be quantified based on these meters.

Additionally, the two smart water meters at Warrnambool College, allow the school to monitor their water usage in real time. This allows the College to identify high water usage periods as well as any leaks that may occur. The smart meters are also incorporated into the school curriculum, increasing students' awareness of water usage. Future upgrade of other water meters in Albert Park could provide improved information to Council and Albert Park users to better inform and implement Integrated Water Management.

PRELIMINARY TANK SIZING

TANK #	BUILDING LOCATION	ROOF AREA (m²)	TANK SIZE (kL)	ANNUAL WATER SAVINGS (ML/yr)
1	Bowls Club	1970	25	0.79
2	Table Tennis Club	666	10	0.20
3	Hockey Club	348	5	0.09
4	Reid Oval	262	5	0.08
5	Reid Oval	1310	15	0.46
6	Reid Oval	426	5	0.10
7	Reid Oval	747	10	0.26
8	Walter Oval	1000	10	0.33
9	Mack Oval	410	5	0.11
Total				2.42
Total savings for College Rainwater Tanks (Section 6.4)				2.96
Total water savings for whole of park				5.38



OPPORTUNITY IDENTIFICATION RAINWATER TANKS
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 07
Rev: B
Date: 04.07.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Rainwater Tank
- Water Meter
- Smart Water Meter

1:4500

50 0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 54
Paper size A3 Landscape

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08
IWM OPPORTUNITIES IN ALBERT PARK - URBAN GREENING

URBAN GREENING INITIATIVE

A key theme identified in the Opportunity Identification workshop, was to increase the native vegetation and provide a biodiversity link from the park to Russells Creek. Increasing vegetation provides many benefits to the park, including:

- Increase cooling
- Mitigate the urban heat island effect
- Improve amenity
- Improve air quality
- Provide refuge for wildlife to move safely within an urban environment
- Create wildlife habitat, and
- Intercept stormwater runoff.

The potential areas for establishing vegetation are shown on the adjacent plan. The plan highlights increased vegetation in the following areas:

- East of Mack Oval
- At the corner of Grafton Road and Cramer Street, as Warrnambool College has expressed interest in increasing vegetation in this area.
- The middle of Albert Park, creating a link from the existing established vegetation and the native kangaroo grass closer to Russells Creek.
- As a future option, vegetation is proposed to complete the biolink from Albert Park to Russells Creek. This is shown as indicative only as it is not located within the subject site of this study.

OPPORTUNITY IDENTIFICATION- VEGETATION
ALBERT PARK IWM PLAN

NOTATIONS

File Ref: 306133
Plan: W GIS 06
Rev: B
Date: 22.08.2019

Designed: J. VEARY
Checked: J. WARD
Authorised: M. YULE

LEGEND

- Contours
- Existing Native Kangaroo Grass
- Proposed Biolink/Vegetation
- Future Biolink Extension (shown indicatively-not on Council land)

1:5389

50 0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 55
Paper size A3 Landscape

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09
IWM OPPORTUNITIES IN ALBERT PARK - EDUCATION AND INFORMATION

Several educational initiatives are proposed throughout Albert Park for the purpose of spreading awareness of the water cycle and water consumption, and cultural values of water and landscape.

EDUCATION PROGRAM

Warrnambool College has expressed their interest in partnering with Warrnambool City Council and Wannon Water to develop a water education program, which can be incorporated into their curriculum. The aim of this education program would be to increase awareness of the water cycle and educate the students on the importance of reducing water consumption.

Warrnambool College is currently a part of DELWP's Schools Water Efficiency Program (SWEP). The school has two data loggers on the school's water meters allowing staff to monitor and track their water usage, as well as to incorporate the data into the school's curriculum.

The proposed education program would build on the initiatives Warrnambool College has implemented as a part of the SWEP program.

Key themes of the proposed education program could include:

- Water cycle
- Water Sensitive Urban Design
- Managed Aquifer Recharge
- Water saving initiatives
- Water efficiency and best practice irrigation
- Importance of healthy rivers and waterways
- Cultural values of water and landscape
- Biodiversity
- IWM initiatives within Albert Park, and
- Monitoring water usage with smart metres to increase awareness

EDUCATION AROUND THE PARK

In addition to incorporating water education into the Warrnambool College curriculum, it is proposed to implement measures throughout Albert Park for the purpose of increasing awareness of the water cycle and natural environment, and promoting reduction in water consumption and littering to the broader community.

Key initiatives include:

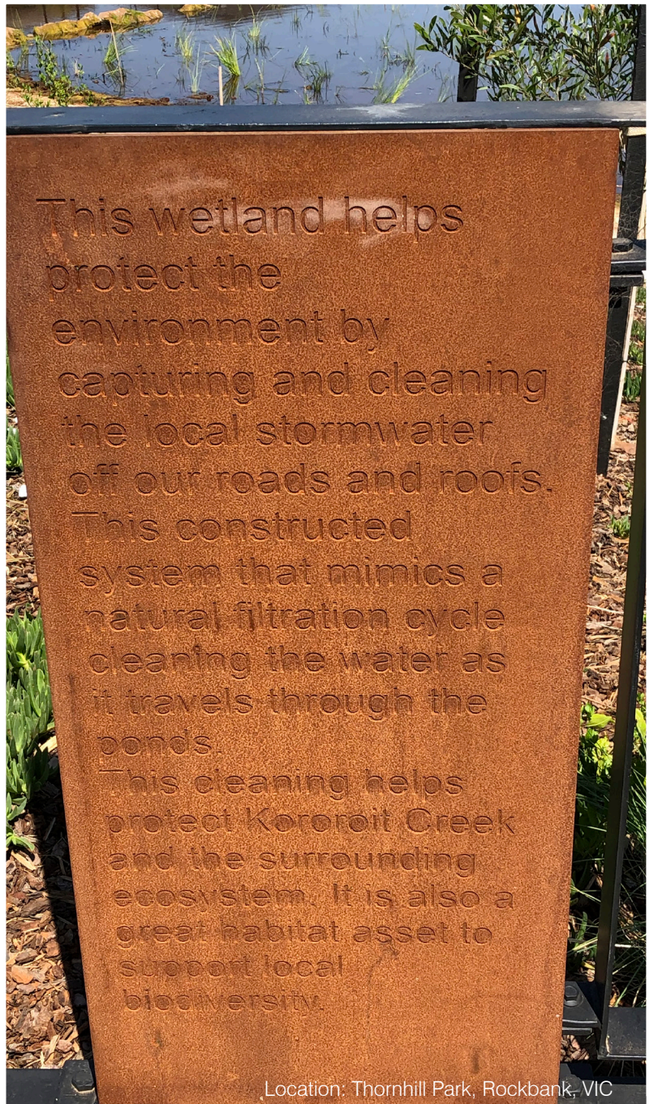
- Signage:
  Signage is proposed throughout Albert Park to provide details on the IWM initiatives (i.e. raingardens, wetland, increased vegetation) throughout Albert Park and to highlight the function and benefit the assets can have on the environment and community.
- Workshops:
  This initiative is proposed to build on the previous "Going Upstream Projects." These projects consisted of two series of educational activities. The first series involved workshops hosted by Warrnambool Community Garden open to the community on promoting water supply information and savings measures. The second series consisted of educational activities in schools on water conservation and river health. A demonstration site with interpretive artwork about the Going Upstream Project and water saving measures can be viewed at the Warrnambool Community Garden.

TRADTIONAL OWNER ENGAGEMENT

Support for the water education program and interest in incorporating the indigenous history within the program has been expressed by traditional owners. Additionally, information boards are proposed to acknowledge the significance. Further investigation and engagement should be considered for confirmation of significate sites within the Park.

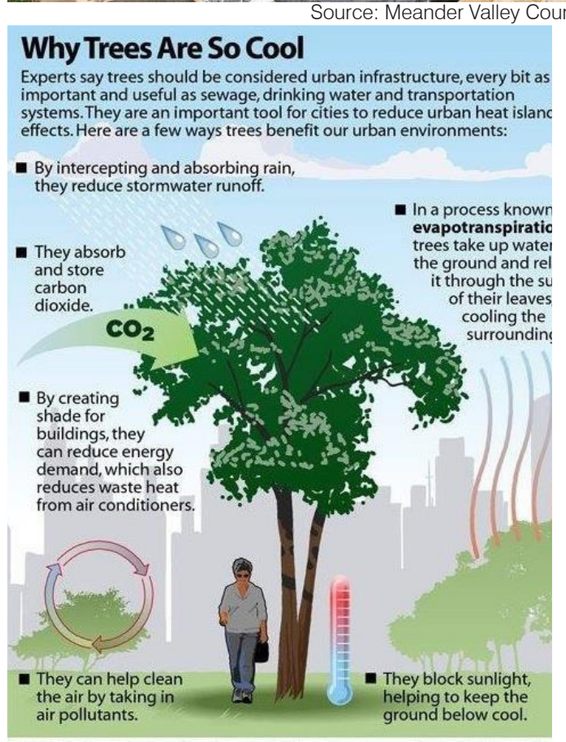
Furthermore, Warrnambool College has expressed their interest in creating a yarning circle within Albert Park. This site is proposed to incorporate a seating area for the students and the broader community that acknowledges the traditional owners of the land. The proposed location of the site is shown in the below plan.

Location: Adelaide Botanic Garden



Location: Thornhill Park, Rockbank, VIC


Source: Meander Valley Council



10
WATER BALANCE: FOLLOWING IWM PLAN

WATER BALANCE

Based on the proposed opportunities, an updated water balance has been modelled.

Implementation of the proposed IWM measures resulted in:

- Increased infiltration
- Decreased volume of water discharging to Russells Creek
- Decreased main water usage
- Increased vegetation, and
- Increased urban cooling across the park

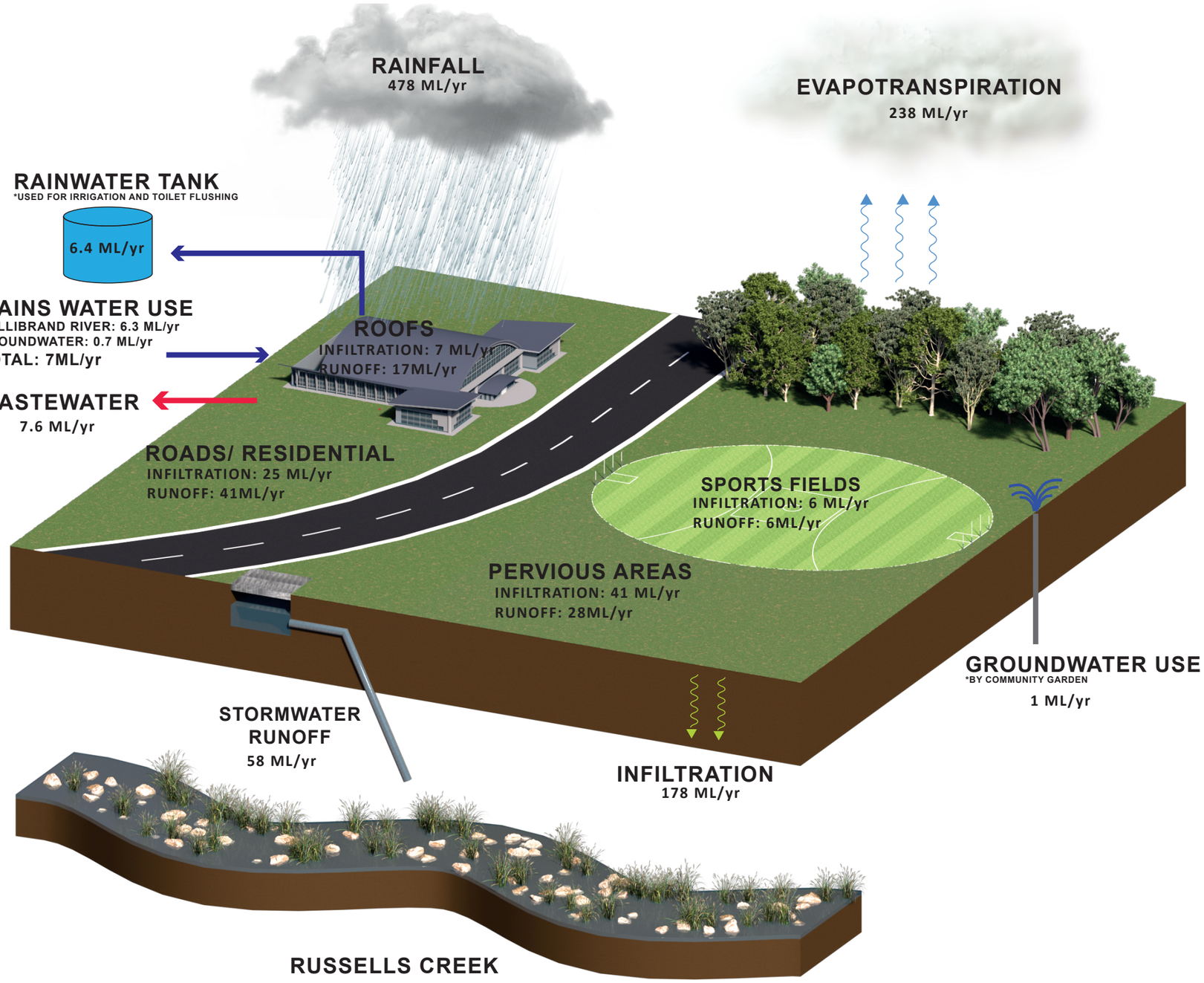
Refer to Figure 3 for the proposed water balance.

POLLUTANT LOAD REDUCTION

Pollutant loads from Albert Park were modelled for existing and proposed conditions. The below table shows the percent reduction of each pollutant in the proposed conditions.

POLLUTANT	ORIGINAL LOAD	RESIDUAL LOAD	% REDUCTION
Total Suspended Solids (kg/yr)	46500	32700	30
Total Phosphorus (kg/yr)	92	69	25
Total Nitrogen (kg/yr)	582	473	19

FIGURE 3: PROPOSED WATER BALANCE FOR ALBERT PARK



*Modelled as if all proposed opportunties are adopted (excluding Japan St catchment)

11
IWM IN PLANNING AND POLICY

ALBERT PARK IWM POLICY

The purpose of this policy is to ensure that the principles of Integrated Water Management is considered within any planning permit or development at Albert Park. The intention of this IWM Plan and future works associated with this policy will allow for Albert Park to be a leader in community led IWM.

Albert Park's IWM approach to planning will promote and consider the water cycle. The collaborative planning and management of water, land and related services will maximise economic and social wellbeing within the Park, while preserving the sustainability of the local ecosystem.

This approach encompasses all development within the Park and should consider the entire water cycle including water supply, sewage management, drainage and flood management, waterways and ecosystems, urban amenity, education and considers the local cultural and community values in the development.

A key outcome of this IWM Policy will be the development of IWM Plans with each planning permit to facilitate a more holistic approach to water management that enables development, while also protecting environmental, cultural and community values and building resilience to climate change.

INTEGRATED WATER MANAGEMENT CONSIDERATIONS

Any development or works within Albert Park should consider the following within the development:

- Consideration of implementing rainwater tanks on buildings, if it doesn't already exist. The rainwater tanks should be connected to internal facilities, such as toilets.
- Collection, treatment, and infiltration of runoff from hardstand and impervious areas should be considered.
- All elements of water cycle management including water supply, sewerage, drainage, waterways and the urban landscape should be considered.
- Vegetation offsets should be considered within any development that increases the impervious area within the Park.
- A minimum of 5 star Green Star rating should be achieved, in accordance with the Green Building Council Australia.

INTEGRATED WATER MANAGEMENT PLAN

As a requirement for any planning permit for development within Albert Park, an Integrated Water Management Plan should be provided. The Plan will document the proposed IWM measures for assessment by Council. The scale of the development does not change the need to manage the water cycle.

Source: Warrnambool Standard

ECONOMIC BENEFITS OF PROPOSED IWM INITIATIVES

BENEFIT	ANNUAL VALUE ($ PV)	ENTITY ATTRIBUTED TO	RATIONAL	REFERENCE	ASSUMPTIONS
Nitrogen Reduction in Russells Creek	$724,305	Glenelg Hopkins CMA	Manager of Russells Creek	Melbourne Water	Melbourne Water nitrogen offset value ($6,645/kg)
Increased Vegetation in Albert Park	$160,000 (once off)	Warrnambool City Council	Double existing vegetation in Albert Park	Thom 2015 Warrnambool City Council	Thom 2015 estimated the value of doubling street trees within a postcode. Based on this assessment a ratio was applied to the existing 450 trees (approx.) within Albert Park compared to the overall number of street trees in Warrnambool.
Community willingness to pay for removal of any water restrictions	$15,200	Community Garden/ Sporting Clubs	Reflects broader societal value	Brent et al 2016	
Flood reduction for McConnell Street	$2,000	Warrnambool City Council	Estimated reduction in damages	Warrnambool Drainage Study Investigation, Water Technology 2018	
Flood reduction for Japan Street	Up to $200,000	Warrnambool City Council	Estimated reduction in damages	Warrnambool Drainage Study Investigation, Water Technology 2018	Potential annual value based on workings with in the Warrnambool Drainage Study Investigation. A feasibility assessment is recommended to confirm potential annual value.
Incorporation of WSUD in the urban environment	$216,000 (once off)	Warrnambool City Council	Estimated value of WSUD within the community	Polyakov et al 2015	
Direct water savings to users of Albert Park	$18,122	Community Garden/ Sporting Clubs	Estimated value of WSUD within the community	Wannon Water	Based on water use over five years
Improved community health and wellbeing	$27,000	Warrnambool City Council	Likelihood of being active when near a green park	Henderson-Wilson et al 2017	Assumed 3,000 users of park per annum, and increase in amenity of 20%
Increase water education and awareness of broader community	$25,100	Wannon Water	Water savings attributed to college water education program		60% of students take up the water education program (960 students), education program results in achieving target water usage (155L/person/day)
Avoided cost of electricity	$2,000	Wannon Water	Estimated reduction in electricity	Wannon Water	
Avoided cost of CO_2 emissions	$340	Wannon Water	Estimated reduction in CO_2 emissions	Department of the Environment and Energy	
Delaying water supply augmentation	Not quantified	Wannon Water	Avoided cost		
Avoided Drainage Maintenance and Replacement	Not quantified	Warrnambool City Council	Avoided cost		
Avoided Water Supply Infrastructure Maintenance and Replacement	Not quantified	Wannon Water	Avoided cost		

REFERENCES:

-Brent, D., Gangadharan, L., Leroux, A., and Rashcy P., 2016, Valuing the multiple benefits of local stormwater management. Mimeo, Monash University Department of Economics.

-Henderson-Wilson, Claire, Sia, Kah-Ling, Veitch, Jenny, Staiger, Petra K., Davidson, Penny and Nicholls, Peter 2017, Perceived health benefits and willingness to pay for parks by park users: quantitative and qualitative research, International journal of environmental research and public health, vol. 14, no. 5, Article number: 529, pp. 1-18.

-Polyakov, M., Fogarty, J., Zhang, F., Pandit, R and Pannell D., 2015, The value of restoring urban drains to living streams, Working Paper 1512, School of Agricultural and Resource Economics, University of Western Australia, Crawley Australia.

-Thom, J., 2015, An Environmental and Economic Analysis of Ecosystems Service Provision by Street Trees in the City of Monash, Honours Thesis, School of Earth , Atmosphere and Environment, Monash University.

-Department of the Environment and Energy, 20, Repealing the Carbon Tax. Australia. https://www.environment.gov.au/climate-change/government/repealing-carbon-tax

12.1

BENEFIT COST COMPARISON- CRAMER STREET

BENEFITS SUMMARY

ALBERT PARK OBJECTIVE	DESCRIPTION	VALUE
REDUCE DEMAND ON POTABLE SUPPLY	• Rainwater tanks within area will decrease potable water demand in facilities • Avoided replacement cost on water supply network	$4,415 per year
REDUCE STORMWATER DISCHARGE	• Potential Flood mitigation in McConnell Street • Reduction in peak flows to Russells Creek • Avoided drainage maintenance and replacement costs	$2,000 per year
REDUCE STORMWATER/ GROUNDWATER POLLUTION	• Reduction of 7.4kg/year of Nitrogen from local waterways	*$49,305 per year*
IMPROVE COMMUNITY AMENTITIES AND WATERWAY HEALTH	• Increased vegetation • Incorporation of WSUD in the urban community	Not Quantified
SUPPORT BROADER COMMUNITY AWARENESS	• Potential for water education through raingarden and rainwater tanks	Not Quantified

COSTS SUMMARY

ITEM		COST
	Raingarden A (5m²)	$5,000
	Soak Pit A (1200x1200 infiltration pit)	$15,000
	Drainage	$13,000
	Landscape (Soak Pit A)	$2,000
	Rainwater tanks (7 tanks)	$65,000
Total Estimated Capital Cost		$100,000
Estimated Operational Cost (per year)		$750

NOTE:
-Capital Cost is based on infrastructure costs only. Modelling and design, cultural heritage, geotechnical, and flora and fauna should be considered for all projects.
-The benefits identified above incorporate both cash and non-cash benefits, with non-cash benefits identified in italics.
REFERENCE:
Costing rates based on:
Melbourne Water, 2013, Water sensitive urban design Life cycle costing data.

12.2

BENEFIT COST COMPARISON- COULSTOCK STREET

BENEFITS SUMMARY

ALBERT PARK OBJECTIVE	BENEFITS	VALUE
REDUCE DEMAND ON POTABLE SUPPLY	• Rainwater tanks within area will decrease potable water demand in facilities • Avoided replacement cost on water supply network	$980 per year
REDUCE STORMWATER DISCHARGE	• Potential Flood mitigation in Japan Street • Reduction in peak flows to Russells Creek • Avoided drainage maintenance and replacement costs	Up to $200,000 per year
REDUCE STORMWATER/ GROUNDWATER POLLUTION	• Reduction of 41.2kg/year of Nitrogen from local waterways	*$273,774 per year*
IMPROVE COMMUNITY AMENTITIES AND WATERWAY HEALTH	• Increased vegetation • Incorporation of WSUD in the urban community • Increased social benefits and attracts wildlife to the park	Not Quantified
SUPPORT BROADER COMMUNITY AWARENESS	• Potential for water education through raingarden and rainwater tanks	Not Quantified

COSTS SUMMARY

ITEM		COST
	Wetland A (1100m^2)	$110,000
	Raingarden B (10m^2)	$10,000
	Swale for Raingarden B	$5,000
	Swale for Wetland A	$5,000
	Rainwater tank (1 tank)	$10,000
	Pump and infrastructure (range)	$300,000-$600,000
Total Estimated Capital Cost		$740,000
Estimated Operational Cost (per year)		$3,700

NOTE:
-Capital Cost is based on infrastructure costs only. Modelling and design, cultural heritage, geotechnical, and flora and fauna should be considered for all projects.
-The benefits identified above incorporate both cash and non-cash benefits, with non-cash benefits identified in italics.
REFERENCE:
Costing rates based on:
Melbourne Water, 2013, Water sensitive urban design Life cycle costing data.

12.3

BENEFIT COST COMPARISON- QUARRY

BENEFITS SUMMARY

ALBERT PARK OBJECTIVE	BENEFITS	VALUE
REDUCE DEMAND ON POTABLE SUPPLY	• Reduction of Potable water use within Warrnambool Community Garden	$6,000 per year
REDUCE STORMWATER DISCHARGE	• Reduced stormwater discharge to Russells Creek	Not Quantified
REDUCE STORMWATER/ GROUNDWATER POLLUTION	• Reduction of 17.7kg/year of Nitrogen from local waterways	*$99,475 per year*
IMPROVE COMMUNITY AMENTITIES AND WATERWAY HEALTH	• Reduction in likelihood of water restrictions affecting operation of Warrnambool Community Garden • Incorporation of WSUD in the urban community	Not Quantified
SUPPORT BROADER COMMUNITY AWARENESS	• Potential for water education through Gellibrand Gully proposal and other water initiatives	Not Quantified

COSTS SUMMARY

ITEM		COST
	Raingarden C (10m^2)	$10,000
	Swale to Raingarden C	$10,000
	Drainage	$10,000
	Groundwater bore	$15,000
	Rainwater tank (1 tank)	$15,000
Total Estimated Capital Cost		$60,000
Estimated Operational Cost (per year)		$1,750

NOTE:
-Capital Cost is based on infrastructure costs only. Modelling and design, cultural heritage, geotechnical, and flora and fauna should be considered for all projects.
-The benefits identified above incorporate both cash and non-cash benefits, with non-cash benefits identified in italics.
REFERENCE:
Costing rates based on:
Melbourne Water, 2013, Water sensitive urban design Life cycle costing data.

12.4

BENEFIT COST COMPARISON- CENTRALISED ROOF WATER HARVESTING

BENEFITS SUMMARY

ALBERT PARK OBJECTIVE	BENEFITS	VALUE
REDUCE DEMAND ON POTABLE SUPPLY	• Reduction in water required to be pumped from the Gellibrand River • Reduction in electricity and CO_2 emitted due to reduction in pumping	$2,340 per year
REDUCE STORMWATER DISCHARGE	• Reduced stormwater discharge to Russells Creek	Not Quantified
REDUCE STORMWATER/ GROUNDWATER POLLUTION	• Reduction of 31.7kg/year of Nitrogen from local waterways	*$210,647 per year*
IMPROVE COMMUNITY AMENTITIES AND WATERWAY HEALTH	• Reduction in ecological stress on the Gellibrand River	Not Quantified
SUPPORT BROADER COMMUNITY AWARENESS	• Potential for water education through centralised roof water harvesting system	Not Quantified

COSTS SUMMARY

ITEM	COST
Drainage	$218,000
Rainwater tanks	$294,000
Total Estimated Capital Cost	$512,000

NOTE:
-Capital Cost is based on infrastructure costs only. Modelling and design, cultural heritage, geotechnical, and flora and fauna should be considered for all projects.
-The benefits identified above incorporate both cash and non-cash benefits, with non-cash benefits identified in italics.
REFERENCE:
Costing values provided by Wannon Water

13
MONITORING, REVIEW AND REPORTING

To ensure the objectives of this document are being met a monitoring, evaluation, reporting, and improvement (MERI) plan is encouraged to be implemented. This plan will aid in assessing the effectiveness and suitability of the proposed opportunities.

The plan will assess the performance of proposed assets/programs and identify opportunities for improvement. The plan could also provide key information and guidance on the direction of future funding.

Recommended monitoring and reporting measures include:

- Annual assessment and reporting on the status and priority of each action within the Implementation Plan.
- Annual monitoring and reporting on the progress towards each objective.
- Establishment of an Implementation Working Group to conduct the above measures.
- Every five years, conduct a strategic review of the implementation plan and consider emerging trends and new policy.

Warrnambool City Council will be responsible for initiating annual review and updates of this IWM Plan with Wannon Water and any other interested stakeholders. Wannon Water and Warrnambool City Council will track and report to each other on actions in the Implementation Plan on an annual basis. The Plan is a live document and will be revised every five years to consider emerging trends and new policy as well as reflect on achievement of objectives and changes to work program priorities.

Unless scheduled otherwise, it is suggested that the review and revision processes should occur immediately before the Warrnambool City Council annual budget cycle so that maximum opportunity can be made of available funding sources and processes in partnership with stakeholder entities.

ALBERT PARK OBJECTIVE	IMPLEMENTATION OF WSUD	INCREASED INFILTRATION AND GROUNDWATER	FLOOD MITIGATION OF LOCAL CATCHMENT	IMPLEMENTATION OF RAINWATER TANKS	DOUBLE VEGETATION IN ALBERT PARK	EDUCATION INITIATIVES THROUGH COMMUNITY AND SCHOOL	IWM POLICY FOR FUTURE DEVELOPMENT
REDUCE DEMAND ON POTABLE SUPPLY	✓	✓✓✓	✓	✓✓✓		✓✓	✓✓
REDUCE STORMWATER DISCHARGE	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓	✓✓
REDUCE STORMWATER/ GROUNDWATER POLLUTION	✓✓✓	✓✓✓	✓✓	✓✓	✓✓✓	✓✓	✓✓
IMPROVE COMMUNITY AMENTITIES AND WATERWAY HEALTH	✓✓	✓✓	✓✓	✓✓	✓✓✓	✓✓	✓✓✓
SUPPORT BROADER COMMUNITY AWARENESS	✓✓	✓	✓✓	✓✓✓	✓	✓✓✓	✓✓✓

CONTRIBUTION TO ALBERT PARK IWM OBJECTIVES

✓✓✓ HIGH ✓✓ MEDIUM ✓ LOW

14
IMPLEMENTATION PLAN

This Implementation Plan was developed for the purpose of establishing actions and associated timeframes for each opportunity. As a part of the monitoring, evaluation, reporting and improvement plan this plan should be reassessed annually.

Council acknowledges the requirement of an investigation on the significance of the site with respect to the tangible and intangible cultural heritage values and will seek opportunities to address it. Additional investigation, including modelling and design, geotechnical, and flora and fauna should also be considered for all projects.

KEY AREA	OPPORTUNITY	ACTION	OWNER	TIME	ESTIMATED INFRASTRUCTURE COST (+/- 50%)
Cramer St	Raingarden A	• Design and construct raingarden	Council	1-3 years	$5,000
	Soak Pit A	• Divert drainage from Bowls Club to a soak pit and provide additional vegetation	Council	Year 1	$30,000
		• Divert drainage from Cramer Street to a soak pit	Council	Year 1	
		• Investigate additional catchment options in McConnell Street, including flood mitigation and pumping options (not included in cost)	Council	5+ years	
Coulstock St	Raingarden B	• Design and construct raingarden and swale	Council	1-3 years	$15,000
	Wetland A	• Design and construct wetland with appropriate amenity considerations, including signage and paths.	Council	3-5 years	$115,000
		• Investigate options and sizes for a wetland within the existing location, based on diverted and potential additional catchments from Japan Street, including flood mitigation and pump arrangements.	Council	3-5 years	$50,000
		• Implement pump and appropriate infrastructure after investigation	Council	3-5 years	$300,000-$600,000*
Quarry and Warrnambool Community Garden	Raingarden C	• Design and construct raingarden and swale	Community Garden	At time of Quarry Redevelopment	$30,000
		• Extend existing drainage north of Quarry to outlet into Quarry	Council	At time of Quarry Redevelopment	
		• Divert water from Wannon Water facility for infiltration in the quarry. Investigate additional catchments to divert additional water for infiltration	Wannon Water	At time of Quarry Redevelopment	
	Groundwater bore/ Tank	• Investigate groundwater bore and rainwater tank options for use by Warrnambool Community Garden, including investigation of water quality and appropriate uses.	Community Garden	At time of Quarry Redevelopment	$30,000
Warrnambool College	Raingarden D	• Investigate options for raingarden catchments from the carpark	Warrnambool College	At time of gym construction	$10,000
		• Design and construct raingarden	Warrnambool College	At time of gym construction	
	Education	• Develop a Water Education Program to incorporate into School curriculum.	Warrnambool College	1-3 years	To be determined
	Rainwater tanks	• Add rainwater tanks to building in school grounds	Warrnambool College	1-3 years	$30,000
Whole of park	Development of signage boards	• Implement appropriate signage at timing of WSUD construction, and educational signage following construction	Council/Wannon Water	1-3 years	To be determined
	Vegetation plan	• Increase the existing amount of vegetation within Albert Park, including determining appropriate location and species of native vegetation.	Council to complete plan	1-3 years	To be determined
		• Engage Landscape Consultant to develop vegetation plan			
	Rainwater tanks	• Implement rainwater tanks on all buildings in Albert Park, including ensuring all tanks are pumped into appropriate facilities to maximise water reuse.	Council and Sports Clubs	1-3 years	$80,000
Northwestern end of park	Centralised Roof Water Harvesting	• Complete business case	Wannon Water	Year 1	$5,000
		• Design and construct roof water harvesting system		2-5 years	$512,000
IWM Planning	Development Controls	• Adopt IWM Controls for all development within Albert Park	Council	Year 1	Nil

*Estimated range of infrastructure. To be determined following further assessment.

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