

# CITY OF ARMADALE

## MINUTES

OF THE TECHNICAL SERVICES COMMITTEE MEETING HELD IN THE  
FUNCTION ROOM, ADMINISTRATION CENTRE, 7 ORCHARD AVENUE,  
ARMADALE ON WEDNESDAY, 9 JUNE 2021 AT 7.00PM.

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**PRESENT:** Cr G Nixon (Chair)  
Cr C Frost (Deputy for Cr M Silver)  
Cr R Butterfield  
Cr E J Flynn  
Cr M S Northcott  
Cr S Peter JP  
Cr G J Smith

**APOLOGIES:** Cr Silver (Leave of Absence)

**OBSERVERS:** Nil.

**IN ATTENDANCE:** Mr J Lyon Executive Director Corporate Services  
Mr T Naude A/Executive Director Technical Services  
Mr N Burbridge A/Manager Parks  
Mr M Tapscott Manager Engineering Design  
Ms E Somers Landscape Architect  
Mrs A Owen-Brown Senior Administration Officer

**PUBLIC:** Nil.

*"For details of Councillor Membership on this Committee, please refer to the City's website  
– [www.armadale.wa.gov.au/your council/councillors](http://www.armadale.wa.gov.au/your council/councillors)."*

## **DISCLAIMER**

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The Disclaimer for protecting Councillors and staff from liability of information and advice given at Committee meetings was not read as there were no members of the public present.

## **DECLARATION OF MEMBERS' INTERESTS**

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Nil.

## **QUESTION TIME**

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Nil.

## **DEPUTATION**

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Nil.

## **CONFIRMATION OF MINUTES**

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### **RECOMMEND**

Minutes of the Technical Services Committee Meeting held on 3 May 2021 be confirmed.

Moved Cr R Butterfield

MOTION CARRIED

(7/0)

## **ITEMS REFERRED FROM INFORMATION BULLETIN**

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*If any of the items listed above require clarification or a report for a decision of Council, this item to be raised for discussion at this juncture.*

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## **TECHNICAL SERVICES COMMITTEE**

**9 JUNE 2021**

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***1.1 - WARTON ROAD DUPLICATION - REQUEST FOR DELEGATED AUTHORITY  
TO APPLY FOR CLEARING PERMIT***

WARD : RANFORD  
FILE No. : M/346/21  
DATE : 18 May 2021  
REF : CO/KB/DH  
RESPONSIBLE MANAGER : Executive Manager Technical Services

**In Brief:**

- The City of Gosnells is applying for a permit to clear native vegetation under the *Environmental Protection Act 1986* for the purpose of duplicating Warton Road in Canning Vale.
- Three land parcels (dedicated road reserve) that fall within the City of Armadale's management authority require vegetation clearing for the purpose of road duplication.
- The City of Armadale previously supported the proposal to clear within two of these parcels (Part A), requesting further information with regard to one parcel (Part B).
- The City has since received the further information requested in respect to Part B as detailed within this report.
- This report recommends that Council authorise the Chief Executive Officer to sign a letter of authorisation for the City of Gosnells to submit an Application to Clear Native Vegetation under the *Environmental Protection Act 1986*, on land parcel (PIN 40797) for the purpose of the duplication of Warton Road.

**Tabled Items**

Nil.

**Decision Type**

- Legislative** The decision relates to general local government legislative functions such as adopting/changing local laws, town planning schemes, rates exemptions, City policies and delegations etc.
- Executive** The decision relates to the direction setting and oversight role of Council.
- Quasi-judicial** The decision directly affects a person's rights or interests and requires Councillors at the time of making the decision to adhere to the principles of natural justice.

### **Officer Interest Declaration**

Nil.

### **Strategic Implications**

The subject of this report has impact on the following objectives of the Strategic Community Plan 2020-2030:

- 2.1 Conservation and restoration of the natural environment
  - 2.1.7 Biodiversity is managed to preserve and improve ecosystem health
- 2.3 Functional, inclusive and sustainable infrastructure

### **Legal Implications**

An assessment of legislative and regulatory requirements that are applicable to the proposed works is summarised below.

State legislation (significant proposals, proposals likely to have an impact of protected matters, clearing proposals):

- *Environmental Protection Act 1986* (EP Act), Section 51 (Clearing of native vegetation).
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

### **Council Policy/Local Law Implications**

Assessment of Policy/Local Law indicates that the following is applicable:

- Council Policy ADM 21 – Authority to Sign Documents

### **Budget/Financial Implications**

The adoption of the recommendation contained in this report has no financial implication.

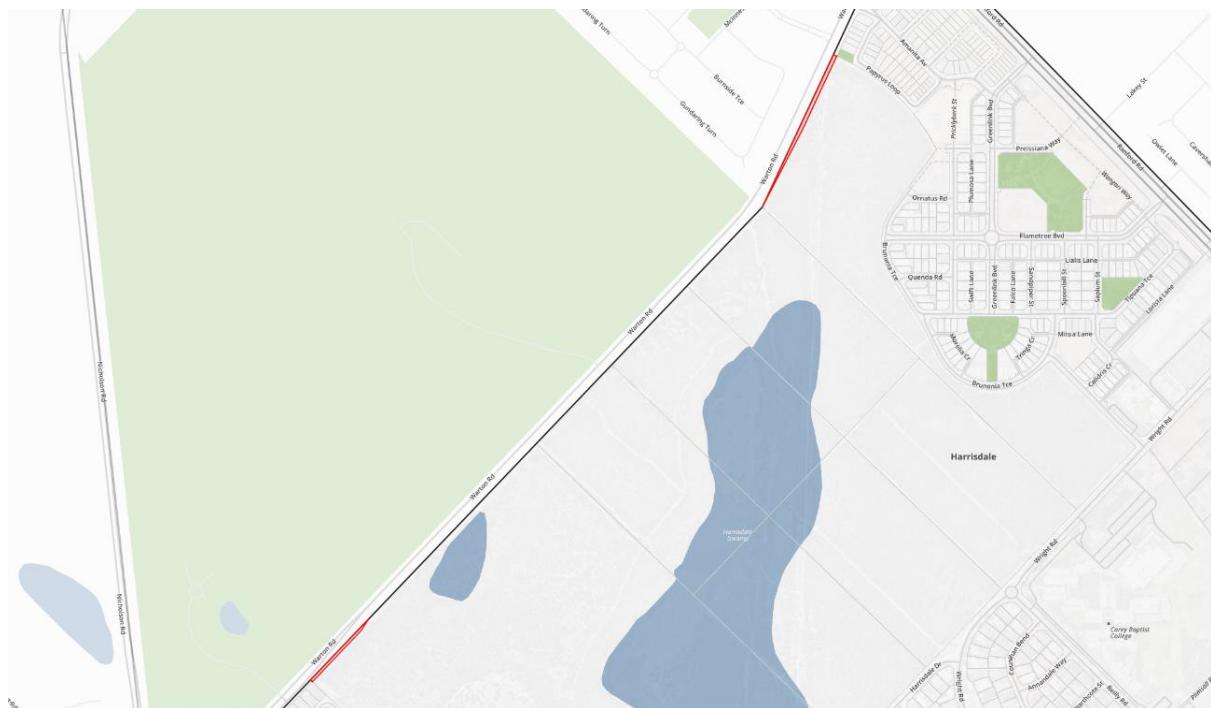
### **Consultation**

- Inter Directorate
- City of Gosnells

## BACKGROUND

Warton Road is proposed to be duplicated between Ranford Road and Nicholson Road and is funded by the Metropolitan Regional Roads Group (MRRG) Road Improvement Program as a joint application by the City of Armadale (CoA) and the City of Gosnells (CoG). Overall project implementation for the design and construction of the Warton Road duplication is being managed by the CoG.

The majority of the Warton Road reserve sits outside of the CoA municipal boundary with the exception of three land parcels. Two of these areas: PIN 12434990 and PIN 12434988 (referred to as Part A) were acquired by the CoG for the purpose of road duplication but vested in the CoA. A proposal to clear native vegetation within Part A was considered and supported by Council in March 2021 (T14/3/21 refers). The location of Part A is shown in Figure 1.



*Figure 1: Location of Part A Clearing works in City managed areas. PIN 12434990 (referred to as the northern land parcel) and PIN 12434988 (referred to as the southern land parcel) that were acquired by the City of Gosnells for the purpose of road duplication but vested in the City of Armadale.*

The location of the third parcel that is vested in the CoA (PIN 40797) is shown in Figure 2 and is referred to in this report as Part B.



Figure 2: Part B (PIN 40797) proposed clearing for the Warton Road duplication proposal.

Whilst all three land parcels fall within the same Warton Road duplication project works, they were separated as Part A and B to ensure a clear distinction of the areas based on the level of environmental information that has been provided to support consideration of the request.

When considering the proposal to clear native vegetation for this project at the March 2021 meeting, Council resolved to support the application for Part A and request further information from the CoG to support the potential future clearing request for Part B.

The CoG have requested that the CoA sign a letter of authorisation for the CoG to submit an Application to Clear Native Vegetation under the *Environmental Protection Act 1986*, on land parcel (PIN 40797) for the purpose of the duplication of Warton Road.

## DETAILS OF PROPOSAL

Part B comprises an area of 186m<sup>2</sup> of native vegetation proposed for clearing (Figure 2). The proposed clearing area is outside (but adjacent to) an area of Public Open Space (POS) generated as part of Subdivision 157228 that, consistent with Condition 14 of the subdivision approval, requires a Bushland Management Plan to ensure the protection of the environmental assets of the site. In the longer term this POS will be managed by the CoA.

Council, when considering the March 2021 report, requested that the CoG give consideration of opportunities to preserve vegetation in the Part B area where possible. The City of Gosnells have provided the following statement with regards to minimisation of the clearing footprint.

*Warton Road immediately adjacent to the uncleared lot has an existing narrow verge which batters down to existing ground level. In order to tie the new duplication works into the existing intersection, a small amount of additional fill is required. If a standard 1 in 3 fill batter slope is used it will create a larger footprint of the road, resulting in further working space for construction, therefore a greater impact to the existing vegetation growing along the existing verge batter slope.*

*In order to minimise the clearing footprint, the design has incorporated a retaining wall to retain the new fill by avoiding the necessity of battering in to the existing ground at a 1 in 3 slope. The City of Gosnells has further considered installing a Twinside retaining wall instead of a limestone block retaining wall. By selecting a Twinside retaining wall, area of construction disturbance is minimized and hence the clearing footprint is minimised. In view of the above, it can be concluded that the City of Gosnells has endeavoured to minimise the clearing footprint to avoid native vegetation clearing as far as possible.*

In addition, the CoG also engaged *Emerge Associates* to complete an environmental assessment report for the area proposed to be cleared under Part B. The environmental report was prepared following a reconnaissance survey of the site in April 2021. A summary of the report findings is provided below.

- The area of plant community within the clearing permit application area was mapped as being in degraded condition, due to limited native species present in the understorey layer, weed invasion and the alteration of the landform.
- As the vegetation within the clearing permit application area is in degraded condition, it is not considered to represent Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) types typical of the area.
- Based on the small extent of vegetation proposed to be cleared, the removal of vegetation within the clearing permit application area is unlikely to have a significant impact on a habitat for fauna indigenous to Western Australia.
- In addition to the understory, three trees occur within the clearing area. This includes two *Allocasuarina fraseriana* trees and one small *Melaleuca preissiana*.

- One individual specimen of the Priority 4 species *Verticordia lindleyi* subsp. *lindleyi* was noted to occur approximately 10m to the east of the clearing permit application area (not within the application area). Absence of this species in the survey area could not be confirmed but is assumed to be absent given the degraded condition of the vegetation.
- The proposal is considered “not in variance” to any of the ten clearing principles of the *Environmental Protection Act 1986* (refer to the detailed summary provided at attachment 1).

An image of the vegetation proposed to be cleared is provided in Figure 3.



**Figure 3:** Image of the vegetation proposed to be cleared. The boundary of the clearing permit application area is from the left hand side of image to the blue flagging tape that is shown at the base of the bund.

As Part B requires the clearing of native vegetation, the proposal will require a clearing permit under the *Environmental Protection Act 1986*. The CoG have requested the landowner (CoA) support this proposal and provide their authority for CoG to sign the C1 Native Vegetation Clearing Permit Application on CoA’s behalf.

## OPTIONS

1. Council could support the application for the clearing of Part B.
2. Council could not support the application for the clearing of Part B.

Option 1 is recommended to allow the duplication project to proceed. Once completed, the duplication of Warton Road will significantly improve traffic flow and movement through the area.

## CONCLUSION

The City has previously supported the proposed widening of Warton Road in Canning Vale and the associated clearing of 248m<sup>2</sup> of vegetation on two City of Armadale vested areas (PIN 12434990 and PIN 12434988).

A further 186m<sup>2</sup> of vegetation clearing within Part B (one parcel PIN 40797) is proposed. The Part B proposal has been subject to an environmental survey and assessed as “not in variance” to any of the ten clearing principles of the *Environmental Protection Act 1986*.

It is recommended that Council support the application to clear native vegetation in Part B for the purpose of upgrades to Warton Road in Canning Vale.

## ATTACHMENTS

1.↓ Assessment of Proposal against Clearing Principles

## RECOMMEND

T39/6/21

**That Council authorise the Chief Executive Officer to sign a letter of authorisation for the City of Gosnells to submit an Application to Clear Native Vegetation under the *Environmental Protection Act 1986*, on one land parcel (PIN 40797), for the purpose of the widening of Warton Road, on behalf of the City of Armadale.**

Moved Cr S Peter

MOTION CARRIED

(7/0)

## **2.1 - PROVISION OF PUBLIC TOILETS AT EXPLORER PARK**

WARD : RANFORD  
FILE No. : M/208/21  
DATE : 22 March 2021  
REF : ES/DH  
RESPONSIBLE MANAGER : Executive Manager Technical Services

### **In Brief:**

- At the Council meeting held on 7 December 2020, the matter of provision of a public toilet at Explorer Park was referred to the Technical Services Committee.
- This report recommends that Council consider the funding of a public toilet at Explorer Park in the 2022/23 long term financial plan.

### **Tabled Items**

Nil.

### **Decision Type**

- Legislative** The decision relates to general local government legislative functions such as adopting/changing local laws, town planning schemes, rates exemptions, City policies and delegations etc.
- Executive** The decision relates to the direction setting and oversight role of Council.
- Quasi-judicial** The decision directly affects a person's rights or interests and requires Councillors at the time of making the decision to adhere to the principles of natural justice.

### **Officer Interest Declaration**

Nil.

### **Strategic Implications**

#### 2.3 Functional, inclusive and sustainable infrastructure

- 2.3.1 The condition of the City's assets are accurately captured, regularly reviewed and the subject of comprehensive management plans in order to assist Council balance the financial cost of asset renewal and replacement with delivery of other community priorities.

### **Legal Implications**

General assessment of relevant legislation (eg *Local Government Act 1995*) has not revealed any restrictions.

### **Council Policy/Local Law Implications**

General assessment has not revealed any applicable Policies/Local Laws.

### **Budget/Financial Implications**

No specific funding has currently been provided for the supply, installation or ongoing cleaning and maintenance costs associated with the installation of a public toilet at Explorer Park.

### **Consultation**

- Intra Directorate
- Public/Community Consultation.

## **BACKGROUND**

At the Council meeting held on 7 December 2020, the following matter was referred to the Technical Services Committee:

*“That the matter of provision of a public toilet at Explorer Park be referred to the Technical Services Committee.”*

The referral item requested that the City investigate whether the developer (who currently manages and maintains the Park) has any plans to install a toilet or if not, that inclusion of a public toilet at Explorer Park be considered in the next five year Long Term Financial Plan (LTFP).

Following consideration of the referral item, Council resolved to receive a report on the provision of public toilets at Explorer Park at a future Technical Services Committee meeting (T67/12/20 refers).

Explorer Park is named Avalanche Park within the City's Intramaps system. For the purposes of consistency with the original referral item, the name Explorer Park will be used in this report.

## DETAILS OF PROPOSAL

Explorer Park is currently under the management of the developer Stockland, with expected handover to occur in December 2021. The landscape plans were approved on 29 November 2018 and there was no requirement for a toilet facility as part of the Technical Services approval process. Stockland have no plans to install a toilet within the reserve and have no obligation to do so under their development conditions.

The City's Parks Facilities Strategy (the Strategy) was adopted on 1 October 2018 (T77/10/18 refers) and is intended to address the diverse community needs and expectations through the appropriate provision of space, form and infrastructure; ensuring parks and facilities are planned and allocated accordingly.

Explorer Park is classified as a Neighbourhood Recreation Park under the Parks Facilities Strategy. In accordance with the City's Parks Facilities Strategy, the City would consider installing public toilets in Neighbourhood Recreation Parks which have extensive recreation spaces or which are sites of frequent sporting activity which invite a longer stay.

The City has a Public Toilet Strategy adopted by Council at its meeting of 13 May 2013 (187/5/13 refers), which further guides the provision of public toilets within the City of Armadale. The Public Toilet Strategy is due to be reviewed during 2021/22 as outlined in the City's Corporate Business Plan. The existing Public Toilet Strategy and the assessment criteria contained within, have been used in assessing the request for a public toilet at Explorer Park.

## COMMENT

The Public Toilet Strategy assessment tool has been applied to assess the request. The extensive playground and informal sporting facilities have resulted in a well utilised park and what is currently an increased length of stay of park users. Construction of this park was completed at the end of 2019 and the extensive use and length of visit currently observed may be due to an initial surge of popularity, being a new park feature in the area. This has been the case with other feature parks such as Robot Park and Shipwreck Park, where the patronage dropped after the initial excessively high usage.

Under the criteria contained within the public toilet assessment strategy tool, Explorer Park has an assessment score of 73%.

The Public Toilet Strategy indicates the following score ranges:

- 80% plus – provision of public toilet recommended
- 60-80% – provision considered but public consultation required
- Below 60% – no consideration.

## ANALYSIS

### Existing Provision

Currently the City has two public toilet facilities scheduled for construction as part of the 2020/21 Budget. One is located at Gwynne Park and one at Don Simmons Reserve. These reserves are within a four minute drive or 27 minute walk and a five minute drive or 30 minute walk respectively from Explorer Park.

In addition there is an existing public toilet facility at Shipwreck Park. This is a three minute drive or 19 minute walk from Explorer Park.

By the end of 2021, there will be three public toilet facilities within 1.5km of Explorer Park. This is a relatively high number of public toilet facilities for the area. Refer to Attachment 1 – Nearby Toilet Facility Map.

### Public Consultation Results

The City undertook an extensive survey which was sent out to 424 residents within a 400m walking catchment of the proposed toilet facility. This survey sought the following comments:

1. How do you rate Explorer Park?
2. Would you support a Universally Accessible Toilet within Explorer Park?
3. If yes, where would you like to see a proposed toilet?
4. Anything else you would like to see or any other comments?

9% of residents who received the survey provided a response, of the 38 responses:

- 7 responded ‘No’ (18%)
- 30 responded ‘Yes’ (79%)
- 1 responded ‘Yes and No’ (3%)

### Budget

The installation of a universally accessible toilet at Explorer Park is not currently included in the Parks Long Term Financial Plan.

The estimated cost to install a toilet at Explorer Park is \$214,500 as detailed in Table 1.

**Table 1: Estimated Cost for Supply and Installation**

<b>Proposed Explorer Park Toilet and Associated Works</b>		
<b>Scope of Works Toilet and Connecting pathways Price ( excl. GST)</b>		
Toilet, lighting, rectification and associated works	Site Works and preliminaries	\$5,000
	Irrigation and turf amendments to accommodate proposed toilet building	\$5,000
	Toilet (incl. plumbing and building)	\$90,000
	Paving to toilet	\$10,000
	Lighting poles and luminaires	\$45,000
	Power connection/fees	\$15,000
	Rectification of existing	\$20,000
	PC inspection and as con data	\$5,000
	Contingency	\$19,500
<b>Total Cost</b>		<b>\$214,500</b>

The cleaning and maintenance of a toilet facility (one cubicle) is estimated at \$25,000 per annum as outlined in Table 2.

**Table 2: Ongoing Cost**

<b>Ongoing Costs after Installation Per Annum</b>		
Cleaning and Maintenance	Annual ongoing costs	\$25,000

## OPTIONS

### Option 1

That capital funding of for the installation of a public toilet at Explorer Park estimated at a cost of \$214,500 and maintenance provisions of \$25,000 pa be considered in the 2022/23 budget and LTFP deliberations.

### Option 2

Not approve the provision of a public toilet at Explorer Park.

## ANALYSIS

From the response to the Community Survey, it is evident that the majority of the respondents are supportive of a toilet being installed at Explorer Park. However, as detailed earlier in this report, it is possible that Explorer Park may currently be experiencing a higher than average level of usage due to being a new facility in the area. There are also two new public toilet facilities at nearby parks coming online this year, which may reduce the demand for a toilet at Explorer Park over the longer term.

Accordingly, and particularly given the Park is currently under the management of the Developer until the end of December 2021, it would be prudent to monitor visitor numbers post handover. Following the upcoming review of the Public Toilet Strategy and pending results of usage, consideration be given for the installation of a public toilet at Explorer Park for inclusion in Council's Long Term Financial Plan with potential implementation in FY 2022/23.

Option 1 is therefore recommended.

## **CONCLUSION**

The City has assessed the provision of a toilet at Explorer Park against the requirements of Council's Toilet Facility Strategy. The outcome of the assessment and the associated community survey was that installation of a toilet at Explorer Park could be considered within the strategy guidelines.

Based on Explorer Park being open for less than 18 months and still under the management of the developer until December 2021; and currently experiencing greater than expected usage which, taking into account usage patterns of other recent feature park facilities, is anticipated to decrease over time. It is recommended that the City review the park usage for another 12 months before considering the installation of a toilet at Explorer Park. This will align with the review of the Public Toilet Strategy during the next financial year.

## **ATTACHMENTS**

1.1      Nearby Toilet Facility Map to Explorer Park

## **RECOMMEND**

**T40/6/21**

**That Council consider in the 2022/23 budget and long term financial plan deliberations, the funding of a public toilet at Explorer Park estimated at a cost of \$214,500 and maintenance provisions of \$25,000 per annum.**

**Moved Cr M S Northcott**

**MOTION CARRIED**

**(7/0)**

## ***2.2 - DRY PARKS STRATEGY***

WARD : ALL  
FILE No. : M/211/21  
DATE : 23 March 2021  
REF : ES/DH  
RESPONSIBLE MANAGER : Executive Manager Technical Services

### **In Brief:**

- As part of the Corporate Business Plan deliberations, a proposal was put forth for the development of a Dry Parks Strategy.
- This report details the City's Dry Parks Strategy and identifies reserves where improvements can be made and implemented.
- This report recommends that Council adopt the City of Armadale Dry Parks Strategy 2021 and allocate funding as detailed in the recommendation.

### **Tabled Items**

Nil.

### **Decision Type**

- Legislative** The decision relates to general local government legislative functions such as adopting/changing local laws, town planning schemes, rates exemptions, City policies and delegations etc.
- Executive** The decision relates to the direction setting and oversight role of Council.
- Quasi-judicial** The decision directly affects a person's rights or interests and requires Councillors at the time of making the decision to adhere to the principles of natural justice.

### **Officer Interest Declaration**

Nil

### **Strategic Implications**

- 2.2 Attractive, inclusive and functional public places  
2.2.4 Develop, improve and maintain quality parks, playgrounds and public open spaces throughout the City.

### **Legal Implications**

General assessment of relevant legislation (eg. *Local Government Act 1995*) has not revealed any restrictions.

### **Council Policy/Local Law Implications**

General assessment has not revealed any applicable Policies/Local Laws.

### **Budget/Financial Implications**

There are currently no funds allocated to the specific improvement of dry parks or the hydrozoning improvement of irrigated parks.

Implementing the recommendations detailed within this report will require the allocation of additional funds to these projects in the 2021/22 Budget and Long Term Financial Plan.

### **Consultation**

- Intra Directorate.

## **BACKGROUND**

As part of the Corporate Business Plan (CBP) deliberations a proposal was put forth for the development of a Dry Parks Strategy during the 2020/21 financial year. This strategy recommends the staged improvement of dry parks over a five year period commencing from financial year 2024/25.

## **DETAILS OF PROPOSAL**

In developing the Dry Parks Strategy (refer Attachment 1), an extensive desktop analysis of every public open space was undertaken with reference to the following criteria:

- Reserve Name
- Parks Facilities Classification
- Reserve Maintenance Classification
- Irrigated (Yes/No)
- Should the reserve be irrigated as per Parks Facilities Strategy classification system (Yes/No)?
- What is the need for improvement (Low, Average, High)?
- Is there a water source available?
- Options for improvement (eg. Recreational improvements, Environmental improvements)
- Are there any other planned improvements for this reserve (Yes/No)?

Through the detailed analysis it became evident that a number of City reserves could benefit from a closer optimisation of water usage. The relevant reserves were analysed against the following criteria:

- Could the irrigation system be further optimised?
- What volume of water could be “saved” from such optimisation
- Are further upgrades to the POS possible to further minimise water usage?
- Can the saved volumes be re-assigned to dry parks for possible further development to an irrigated park standard?

Through ranking the above criteria, the analysis has led to the development of the Dry Park Improvement Framework and Hydrozoning Improvement Framework (refer Attachment 2).

Dry Parks are defined as parks with no irrigation source or irrigation system.

Hydrozoning is the optimisation of an irrigation system to group elements that require similar watering schedules together, to reduce overall water usage.

The Dry Parks Strategy addresses the improvement of the City’s dry parks and the continual improvement of water usage through the establishment of these two frameworks and proposes both frameworks are intended to be implemented concurrently.

The Dry Parks Strategy also outlines a number of options to improve dry parks. One of the options considers irrigation improvements. It is proposed that the City wide audit of passive irrigated reserves is completed during the 2022/23 financial year. This audit will document the existing usage, determine improvements and appropriate water budgeting. This information will be helpful to inform future reserve improvements.

## **COMMENT**

The City of Armadale is one of the fastest growing local authorities in Western Australia with new greenfield and infill development. Purchasers are building larger houses on smaller lots and deciding not to have traditional sized backyards. Larger lots in established areas of Armadale are being subdivided into smaller lots with small houses and no traditional sized backyard.

Both of these development types is resulting in parks, open space facilities and streetscapes being increasingly used for recreation and passive activities. The public open spaces contribute to community health, wellbeing, and support the liveability of our community.

This is putting pressure on local governments to provide and maintain equitable, good quality public open space.

The Dry Parks Strategy highlights that there is an inequitable distribution of irrigated reserves within the City of Armadale. Older Armadale suburbs such as Armadale, Seville Grove, Kelmscott and Brookdale have less irrigated reserves than the newer suburbs of Piara Waters, Harrisdale, Haynes and Hilbert.

The purpose of the Dry Parks Strategy is to outline a framework to improve dry parks and hydrozone others to provide equitable quality open space and implement best practice water usage. In some instances there are no opportunities to irrigate dry parks due to a lack of an available water source and the strategy considers other methods of improvement.

### **Budget**

The improvement of the reserves as outlined in this report have not been included in the Parks 2021/22 budget or Long Term Financial Plan. In addition to any capital improvements, City dry parks receive an average of \$9,500/hectare annually for maintenance. Irrigated reserves receive an average of \$18,500/hectare annually. Any improvements to a dry park would also require the relevant increase in the maintenance budget.

The proposed seven year staged approach is considered prudent to manage financial impacts on the City and the staff resourcing to manage the detailed design, documentation and contract administration of these works.

It is therefore proposed that the Dry Parks and Hydrozoning Improvement Frameworks be implemented as outlined in Table 1.

**Table 1:**

Dry Park Improvement Framework		Proposed Staging and Funding (additional to any proposed LTFP funding) (Subject to further review as detail is obtained regarding water source)							Estimated Increase to the Yearly Maintenance Cost
Reserve Name	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Bavich Reserve	Implementation Planning	D+D	\$ 50,000						\$ 2,130
Robin Park		D+D	\$ 50,000						\$ 2,485
Wilcannia / Toongabbie Park		D + D	\$ 150,000						\$ 7,285
Pelham Reserve				D + D	\$ 150,000				\$ 8,952
Migrant Park				D + D	\$ 150,000				\$ 34,857
Derry Reserve				D + D	\$ 100,000				\$ 18,302
San Jacinta Reserve				D + D	\$ 150,000				\$ 16,172
Dawson Reserve				D + D	\$ 150,000				\$ 11,173
Cam Clay Reserve						D + D	\$ 150,000		\$ 16,920
Hydrozoning Improvement Framework	Proposed Staging and Funding (additional to any proposed LTFP funding) (Subject to further review as detail is obtained regarding water source)							Implementation Planning  No change due to hydrozoning	estimated increase to yearly maintenance cost
Reserve Name	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Ashworth Park	D+D	\$ 30,000							
Batt Park	D+D	\$ 30,000							
Corondale Park		D + D	\$ 200,000						
Don Simmons Reserve			D + D	\$ 100,000					
Teal Brook Park				D+D	\$ 75,000				
Kuhl Park				D + D	\$ 75,000				
Hesketh Park					D+D	\$ 75,000			
Massell Park					D + D	\$ 75,000			
Bronzewing Reserve		D + D	\$ 75,000						
Wallaby Reserve		D + D	\$ 75,000						
<i>NOTE: The estimated costs do not include improvements in the other POS where water may be utilised.</i>									estimated increase to yearly maintenance cost
\$ 160,000 \$ 650,000 \$ 425,000 \$ 450,000 \$ 225,000									\$ 118,275
TOTAL Proposed Dry Park Improvement + Hydrozoning Improvement (excl. GST) \$ 1,910,000									
Irrigation Audit									
Task	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Irrigation Audit	\$ 40,000								

Notes:

1: Westfield Heron ranked 3 in the Dry Park Improvement Framework, however given the extent of upgrade proposed for 2021 no further works are proposed at this stage.

2: D + D = Design and Documentation year

3: All of the parks listed in the Hydrozoning Improvement Framework are located within the City of Armadale sub-area (fully allocated, therefore water sourcing to be reviewed)

## OPTIONS

The options for Council's consideration to proceed with this project are detailed as follows.

### Option 1

Not adopt the proposed Dry Parks Strategy and make no changes to the current Long Term Financial Plan

### Option 2

Adopt the Dry Parks Strategy and give consideration to allocating additional municipal funding for the staged improvements and maintenance requirements outlined the Strategy during future budget deliberations.

### Option 3

Allocate additional municipal funding to the consideration of \$40,000 in the 2022/23 budget for the City wide audit of irrigated passive reserves as described in the Dry Parks Strategy.

Options 2 and 3 are recommended.

## CONCLUSION

The Dry Parks Strategy provides two frameworks, which are intended to be concurrently implemented, to guide:

- The improvement of dry parks
- The hydrozoning improvements of irrigated parks.

These frameworks aim to improve the quality of City parks and allow the City to implement hydrozoning measures to ensure water is being optimally used relative to a park's function.

Currently there are no funds allocated to the specific improvement of dry parks, hydrozoning improvements or irrigation audit of passive reserves within the City of Armadale.

This proposal seeks Council's consideration of a City wide irrigation audit of passive reserves and the implementation of the Dry Parks Improvement Framework and Hydrozoning Improvement Framework over seven years as outlined in Table 1; and the additional ongoing maintenance budget in the year following project completion.

**ATTACHMENTS**

- 1.↓ Draft Dry Parks Strategy
- 2.↓ Dry Park Improvement Framework and Hydrozoning Improvement Framework

**RECOMMEND**

**T41/6/21**

**That Council:**

- 1. Adopt the City of Armadale Dry Parks Strategy 2021.**
- 2. Give consideration to the allocation of additional municipal funding to the consideration of \$40,000 in Council's 2022/23 budget and Long Term Financial Plan deliberations for the City wide audit of irrigated passive reserves as described in the Dry Parks Strategy.**
- 3. Include consideration of the implementation and funding in the Long Term Financial Plan deliberations for capital improvements and maintenance requirements, as detailed in the attached report.**

**Moved Cr R Butterfield**

**MOTION CARRIED**

**(7/0)**

***COUNCILLORS' ITEMS***

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Nil.

**EXECUTIVE DIRECTOR TECHNICAL SERVICES REPORT**

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Nil.

**MEETING DECLARED CLOSED AT 7.27PM**

<b>TECHNICAL SERVICES COMMITTEE</b>		
<b>SUMMARY OF ATTACHMENTS</b>		
9 JUNE 2021		
ATT NO.	SUBJECT	PAGE
<b>1.1 WARTON ROAD DUPLICATION - REQUEST FOR DELEGATED AUTHORITY TO APPLY FOR CLEARING PERMIT</b>		
1.1.1	Assessment of Proposal against Clearing Principles	26
<b>2.1 PROVISION OF PUBLIC TOILETS AT EXPLORER PARK</b>		
2.1.1	Nearby Toilet Facility Map to Explorer Park	30
<b>2.2 DRY PARKS STRATEGY</b>		
2.2.1	Draft Dry Parks Strategy	31
2.2.2	Dry Park Improvement Framework and Hydrozoning Improvement Framework	79

**Attachment 1- Assessment of Proposal against the 10 Clearing Principles of the Environmental Protection act 1986.**

Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity.

The clearing permit application area is located on the Swan Coastal Plain, which is recognised as an area of high biological diversity (EPA 2007). The clearing permit application area contains a total of four native flora species. The plant community **MpAfAc** was considered to be representative of FCT 21c. FCT 21c is included within the ‘banksia woodlands of the Swan Coastal Plain’ Commonwealth Threatened Ecological Community (TEC) and the State Priority Ecological Community (PEC) (P3). FCT 21c is also separately listed at the State level as a PEC. As the clearing permit area does not meet the diagnostic characteristic of containing any *Banksia* spp. it is not considered to represent the banksia woodlands of the Swan Coastal Plain TEC or PEC.

Conservation advice for PECs is less specific than that for TECs, but it is likely that only the areas of vegetation in good or better condition would be considered to represent this PEC. As the clearing permit area is in degraded condition, it is not considered to represent this PEC. As such, the clearing permit area contains no TECs or PECs.

The clearing permit application area does not support a high level of biological diversity. The proposed clearing is therefore not considered to be at variance with Principle (a).

Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Fauna values within the clearing permit application area are limited due to the historical clearing, vegetation degradation, and the presence of weeds. It is unlikely that the clearing permit application area would provide important fauna habitat to conservation significant fauna species given the smallsize of the clearing permit application area, and its highly modified and fragmented environment.

There are also areas of better-quality contiguous vegetation located to the south and east of the clearing permit application area, which are likely to be preferred by native fauna.

Based on the small extent of vegetation proposed to be cleared, the removal of vegetation within the clearing permit application area is unlikely to have a significant impact on a habitat for fauna indigenous to Western Australia. Therefore, clearing within the clearing permit application area is not considered to be at variance with Principle (b).

Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

No occurrences of rare flora were recorded within the clearing permit application area. Whilst the reconnaissance survey was undertaken in April, and thus there is the possibility that rare flora species would not have been discernible at the time of the survey. Most of the conservation significant species likely to occur in the wider area occur in low-lying habitats. The clearing permit area consists of a steep sandy bund with Warton Road to the west and a low-lying area of vegetationto the east. As such, should such species be present, they are considerably more likely to occur to the east of the works area. One exception is the threatened species *Caladenia huegelii*, which occurs in ‘well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels’ (Emerge 2021). Despite this, the species is highly unlikely to occur in a weedy bund close to a main road.

The proposed clearing is therefore not at variance with Principle (c).

Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

No TECs are present within the clearing permit area. Thus the proposed clearing is not considered to be at variance with Principle (d).

Principle (e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Vegetation complex mapping for the Swan Coastal Plain undertaken by Heddle *et al.* (1980) indicates that the clearing permit application area occurs within an area mapped as the 'Southern River complex'. This is described as 'open woodland of *Corymbia calophylla* - *Eucalyptus marginata* - *Banksia* species with fringing woodland of *Eucalyptus rudis* - *Melaleuca rhaphiophylla* along creek beds'.

The Southern River complex has 18.43% of its pre-European extent remaining on the Swan Coastal Plan with 1.18% under formal protection (Government of Western Australia 2018). Within the City of Gosnells, 8.23% of the original extent of the Southern River complex is remaining (Government of Western Australia 2018).

The Environmental Protection Authority's (EPA) (2006) *Guidance Statement No. 10. Guidance for the Assessment of Environmental Factors – Level of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region* identified a standard level of native vegetation retention of at least 10% of the pre-clearing extent of the vegetation complex in 'constrained areas' such as the Swan Coastal Plain portion of the Perth Metropolitan Region.

It is acknowledged that whilst over 10% of the Southern River complex remains on the Swan Coastal Plain, there is currently very low levels of this complex retained in formal protection.

The vegetation within the clearing permit application area has been assessed as being in a 'degraded' condition. Thus the vegetation within the clearing permit area is not considered to represent significant vegetation of the Southern River complex.

Thus, the proposed clearing is not considered to be at variance with Principle (e).

Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

As the vegetation within the clearing permit application area is not directly associated with a wetland, the proposed clearing is not considered to be at variance with Principle (f).

Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

An examination of broad scale mapping places the clearing permit application area within the Southern River association (Churchward and McArthur 1980). The Southern River association comprises 'sandplain with low dunes and many intervening swamps; iron and humus podzols, peats and clays.' Soil landscape mapping indicates that the majority of the clearing permit application area is identified as sand (DPIRD 2019). Due to the features of these soils, the key risk for land degradation is wind erosion.

The proposed clearing of vegetation is unlikely to cause substantial wind erosion within the clearing permit application area, given the small amount of vegetation to be cleared, and mitigation measures to be employed during clearing, including dust suppression and surface

stabilisation where required. Exposed surfaces within the clearing permit application area will be sealed post-clearing.

The proposed clearing is therefore not at variance to Principle (g).

Principle (h) – Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

No conservation reserves are adjacent to the clearing permit application area. The measures for avoiding and mitigating any potential impacts to the portion of Jandakot Regional Park close to Warton Road were detailed in the previous clearing application and comprise a three-year maintenance and monitoring program as outlined in the *Flora and Vegetation and Monitoring Report* including weed control and rubbish removal every 6 weeks within the first 20 m of the regional park. The details of the post-construction monitoring program is outlined in **Section 5.7** of the *Flora and Vegetation and Monitoring Report*. This will allow the applicant to implement additional management measures should the condition of the portion of the Jandakot Regional Park directly adjoining Warton Road showing signs of decline.

Given the management measures proposed by the applicant and that the small area of vegetation within the clearing permit application area is in degraded condition with weed species currently present, the proposed clearing is not considered to be at variance to Principle (h).

Principle (i) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Deterioration in quality of surface water or underground water can occur as a result of activities that result in sedimentation, increased nutrient levels, changes to pH (through acid sulphate soils), salinity or changes in water regimes of groundwater dependent ecosystems. As outlined above, given the small amount of vegetation to be cleared; mitigation measures to be employed during clearing (dust suppression and surface stabilisation where required); and the long-term management of exposed surfaces post-clearing (surface sealing and the installation of linear biofiltration drains to treat road run-off), clearing is not likely to cause a deterioration in water quality.

Acid sulphate soil (ASS) risk mapping prepared by DWER (2021) indicates that the entire clearing permit application area has been identified as having a moderate to low risk of ASS occurring within 3 m of the natural soil surface.

It is unlikely that the proposed clearing will cause ASS or other issues that could cause a deterioration in water quality within or surrounding the clearing permit application area, and therefore the proposed clearing is not at variance with Principle (i).

Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

The clearing permit application area is located within an area that is mapped as having predominantly sandy, free-draining soils.

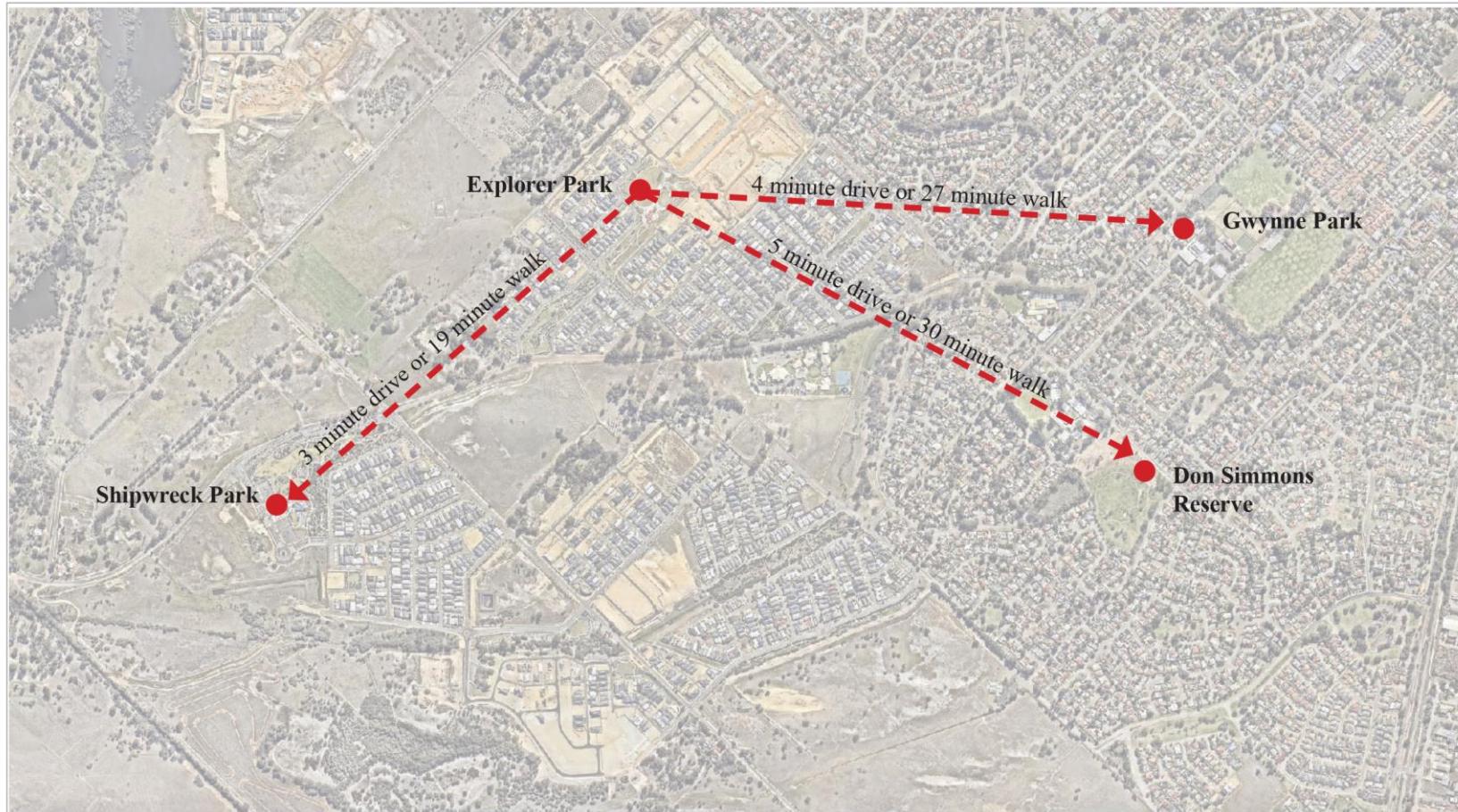
A review of publicly available data and site-specific investigations did not identify any environmental factors that would increase the incidence of flooding, as discussed below:

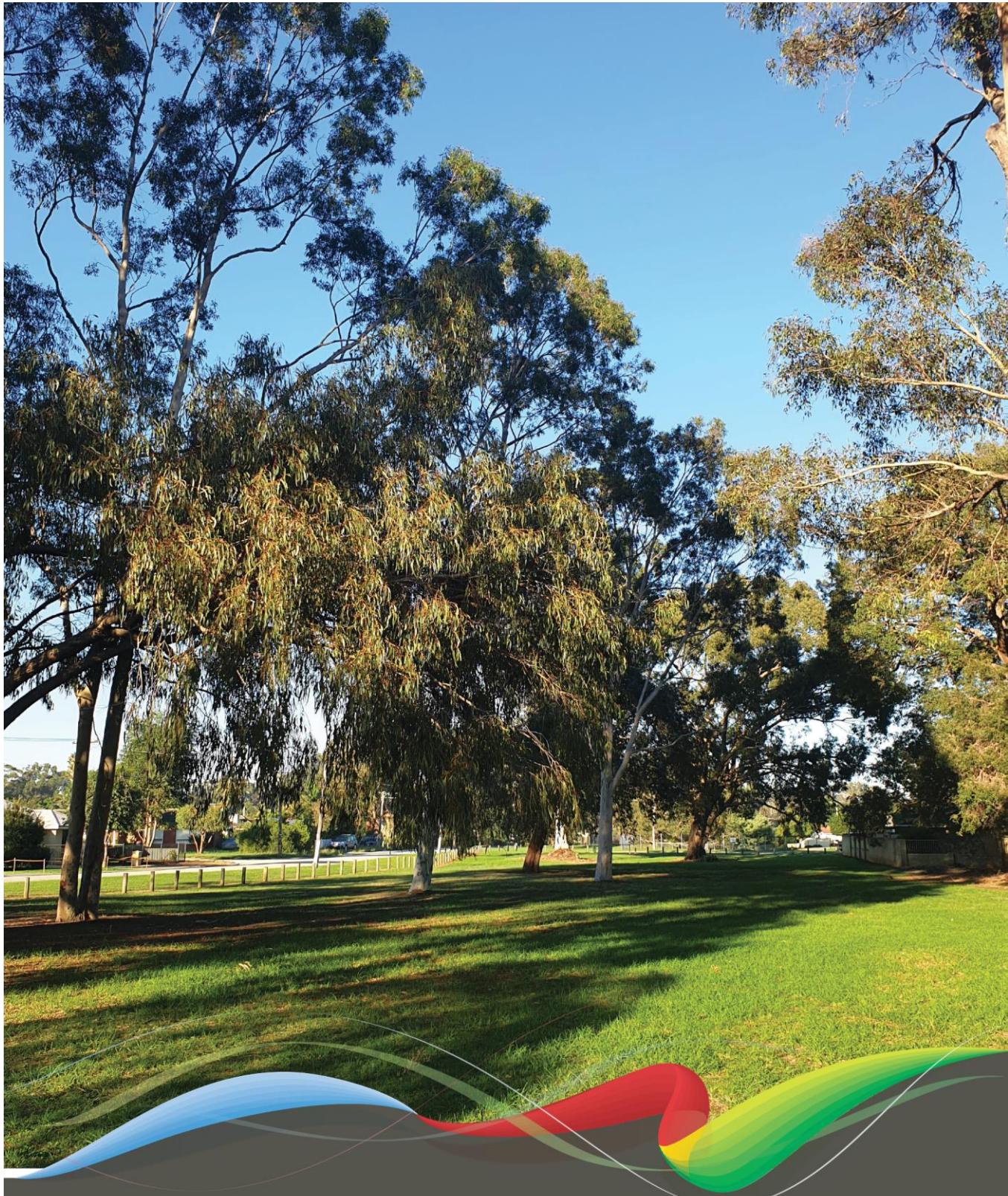
- The water table below the clearing permit application area is between approximately 3.5 to 4 m below the natural surface level (DWER 2021).
- The clearing permit application area is not mapped as occurring within a floodplain area (DWER 2020).

Based on the above factors, the proposed removal of native vegetation within the clearing permit application area will not cause or exacerbate an incidence of flooding. The proposed clearing is not considered to be at variance with Principle (j).

**Attachment 1 – Nearby Toilet Facilities**

Note: Don Simmons and Gwynne Park toilet facilities are scheduled for construction during 2021/2022.





# Dry Parks Strategy

2021





Inside Cover Image: Pelham Reserve, Armadale  
Cover Image: Dawson Reserve, Armadale



# Dry Park Strategy Overview

The Dry Parks Strategy will provide guidance to ensure that the needs and open space expectations of the community, are met through the continual and programmed improvement of the City's dry parks.

## Overview

The Dry Parks Strategy analyses the City's reserves, with particular focus on the dry reserves, and considers various methods of improvement.

Improvement options range from various water sourcing methods, irrigation improvements, recreation or environmental improvements or no improvements.

This Strategy addresses the improvement of the City's dry parks through the establishment of a Dry Parks Improvement Framework (DPIF) and Hydrozoning Improvement Framework (HIF). Refer Attachment C.

This strategy and associated frameworks will provide guidance for the next five years to ensure that the needs and open space expectations of the community, are met through the continual and programmed improvement of the City's dry parks.



Image: Bungendore Park



## Relevant City Documents

The Dry Parks Strategy has impact on the following objectives of the Strategic Community Plan 2020-2030:

**2.2 Attractive, inclusive and functional public places**

- 2.2.4 Develop, improve and maintain quality parks, playgrounds and public open spaces throughout the City.

The Dry Parks Strategy aligns with the following Action in the Corporate Business Plan:

- 1.2.3 Investigate a program for the improvement of the City's dry parks. Develop a dry parks strategy for staged improvement.

This document shall be read and used in conjunction with the following documents:

Document Name	Prepared by	Relevance
City of Armadale Water Position Paper 2021	Sports Turf Technology 2021 on behalf of the City	Provides information regarding irrigation water sources
City of Armadale Citywide Annual Groundwater Monitoring Summary 2019-2020	Sports Turf Technology 2020 on behalf of the City	Provides detail on the City's groundwater licences and annual usage
City of Armadale Parks Facilities Strategy 2018	City of Armadale (Parks)	Provides a comprehensive strategy outlining minimum requirements within a detailed POS classification system
City of Armadale Standard Specification Irrigation System Design and Installation	City of Armadale (Parks)	Specification outlining the City's minimum specifications for an irrigation system
City of Armadale Standard Specification for Bores, Pumps, Headworks and Electrical Cubicles (REV 7 - April 2021)	City of Armadale (Parks)	Specification outlining the City's minimum specifications for irrigation infrastructure
Water Sensitive Cities Benchmarking and Assessment	Prepared by Urbaqua 2020 on behalf of the City	Provides a summary of the City's journey towards becoming a Water Sensitive City
City of Armadale Waterwise Council Action Plan 2020	Water Corporation	Outlines the CoA Waterwise goals and summarises the City groundwater licences
City of Armadale ENG 14 - Landscaping	City of Armadale	Policy relating to the standards of landscaping within the City of Armadale (parks, streetscapes)
Verge Treatment and Management Policy (Under Review)	City of Armadale	Under Review



Image: Corondale Park, Seville Grove



Draft

Date	Revision	Comments
2021	A	Issue for June Council Report
2021	B	Issue for June Council Report - Updated DPIF and HIF
2021	C	Issue for June Council Report - Updated DPIF and HIF (Rev C)
2021	D	Issue for June Council Report - Updated DPIF and HIF (REV D)



# Dry Parks Strategy

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- Attachment C- Improvement Frameworks	

Image: Blackburne Reserve, Kelmscott



## Acronyms

CoA	City of Armadale
DPIF	Dry Parks Improvement Frameworks
MAR	Managed Aquifer Recharge
PFS	Parks Facilities Strategy (City of Armadale)
POS	Public Open Space
DWER	Department of Water and Environment Regulation
PIP	Parks Improvement Plan
WAPC	Western Australian Planning Commission



# Introduction

## What is a Dry Park?

In the context of this report 'Dry Parks' are defined as parks with no irrigation source and irrigation system.

## Process for this Strategy

The outcome of this strategy is the:

- Dry Park Improvement Framework (DPIF)
- Hydrozoning Improvement Framework (HIF).

The process of determining these frameworks is outlined below:

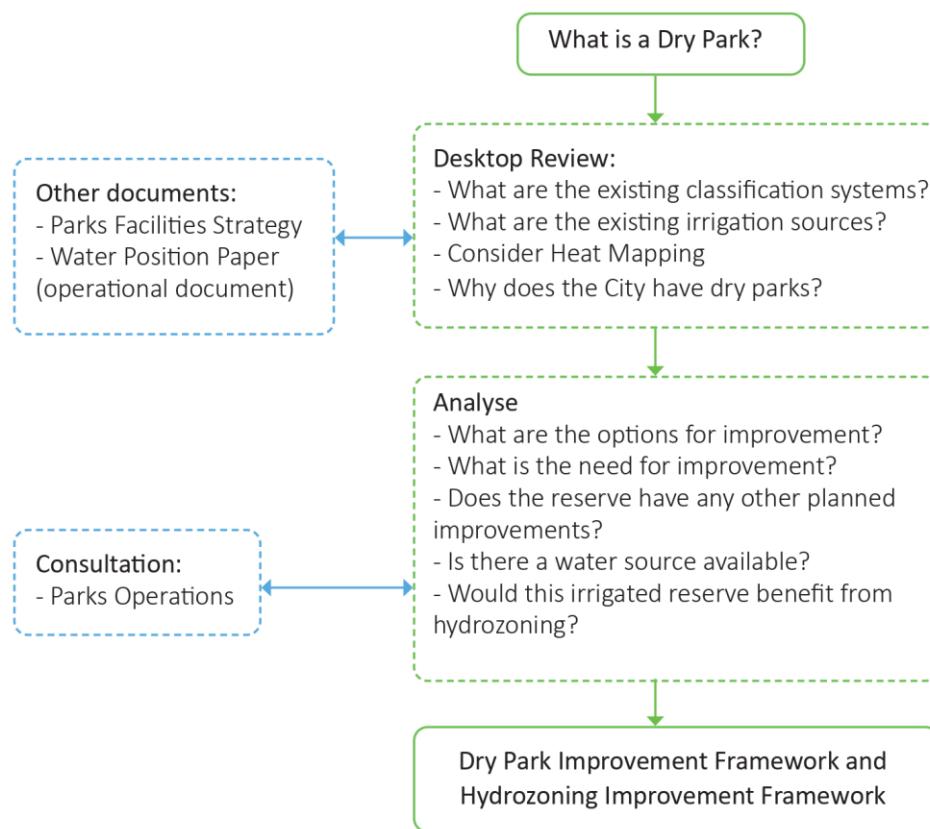


Image 1: Dry Park Strategy Process



## Context

The City is located on the urban fringe of the Perth Metropolitan area and is one of a number of outer metropolitan growth councils.

The City is experiencing sustained rapid growth with the population expected to double between 2010 and 2030;

- 2010 the population was estimated at 61,900\* residents
- May 2021 the population is estimated at 93,928\* residents
- By 2030 the population is expected to be 124,900\* residents

*\*estimates have been extracted from the Id.Consulting webpage May 2021. (<https://forecast.id.com.au/armadale>)*

This growth is predominantly medium to high density housing where the house occupies the majority of the lot, with little to no 'green' space in the front or back yard.

The desire to maximize the built form on the private lot has increased pressure on the City's open spaces to perform the open space function that a 'typical' backyard used to perform – a space to kick the ball, a space to relax and a space to use with your family and friends.

These functions are often associated with 'green' irrigated spaces.



Image: Ticklie Park, Seville Grove



## Parks Classification System

The City has a park classification system based on the following:

- Park size; Local, Neighbourhood, District
- Park function (predominate); Nature, Recreation, Sport.

This classification system allows the City, Developers and other consultants to understand typical ‘facility types’ a park of a certain size and certain function will contain (acknowledging that there are always site specific anomalies).

A ‘facility type’ will have a maximum score of 1, 5 or 10 as listed in Table 1.

To ascertain if a reserve meets the requirements of its particular classification, the reserve is scored against each facility type and an overall facility score is obtained.

Irrigation is a typical ‘facility type’ of the following park classifications:

- District Sport
- District Recreation
- Neighbourhood Sport
- Neighbourhood Recreation
- Local Recreation

In these categories, if a reserve is irrigated, it receives a score of 10.

		Facility Type																																		
		POS Classification	Pathways	Bridges	Signage	Car Parking	Access Control	Lighting	Play	Bin	Dog Bin	Seating	Shelter	Public Toilet	BBQ	Drink Fountain	Shade Sails	Art	Hard Courts	Fitness	Youth	Community Garden	Men's Shed	Dog Park	Irrigation	Trees	Planting	Scheduled Sports	Passive Turf	WSUD	Max Score	Percentage				
DOS	NOS	Sport	1	1	1	10	1	10	10	1	1	1	1	10	10	10	5	1	1	1	5	1	1	1	1	1	10	5	5	10	5	1	120			
		Recreation	1	1	1	10	1	10	10	1	1	1	1	10	10	10	5	1	1	1	1	1	1	1	1	1	10	5	0	5	1	106				
		Nature	1	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	1	18			
LOS	NOS	Sport	1	1	1	10	1	10	10	1	1	1	1	5	1	1	5	1	1	1	1	1	1	1	1	1	10	5	5	10	5	1	93			
		Recreation	1	1	1	1	1	1	10	1	1	1	1	10	1	10	5	1	1	1	1	1	1	1	1	0	0	0	10	5	5	0	5	1	76	
		Nature	1	1	1	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	1	19			
LOS	NOS	Recreation	1	1	1	0	1	0	10	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	10	5	5	0	5	1	45				
		Nature	1	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0	0	1	17				

Table 1: Parks Facilities Strategy - Facility Type



## Parks Classification System v 'Need'

For a Local Recreation reserve where the total possible score is 45, irrigation with a score of 10, is 22% of the total score making it a relatively high and important facility type for Local Recreation reserves.

For the other POS classifications, irrigation makes up the following percentage of the max score for that classification:

- Neighbourhood Recreation 13%
- Neighbourhood Sport 11%
- District Recreation 9%
- District Sport 8%

Irrigation has a relatively high score, particularly in the neighbourhood and local levels on the basis that the provision of irrigation is a basic amenity that enhances a park visually, but importantly provides a level of amenity that allows year round usage, for people of all ages and abilities.

Irrigation cools a park, reduces dust / sand drift and enhances the year round usability of the park.

In determining the Dry Park Improvement Framework we ascertained the 'Need' for improvement and this relates directly to the irrigation 'facility type'.

The City reviewed all of the reserves and noted if they were unirrigated. If a reserve was unirrigated and classified Local Recreation, Neighbourhood Recreation, Neighbourhood Sport, District Recreation and District Sport, their 'Need' score was High (max score of 10).

Not all of the dry parks will need to be considered for improvement as they may already meet the needs of their particular park classification system or other factors may limit improvement.



Image: Barry Poad Reserve, Seville Grove



## Parks Maintenance Classification

The following maintenance classifications include non-irrigated and irrigated reserves:

- Passive Reserve Level 4 Dry (18)
- Passive Reserve Level 3 Low (130)
- Passive Reserve Level 2 Moderate (54)
- Natural Area Wet (205)
- Natural Area Dry (180)

The following maintenance classifications include irrigated reserves only:

- Passive Reserve Level 1 High (3)
- Active Sport (23)

(Note: the above figures include, where known, 'future' reserves which have been mapped)

City dry parks receive an average of \$9,500/hectare annually for maintenance. Irrigated reserves receive an average of \$18,500/hectare annually.

Any improvements to a dry park will result in the appropriate increase in the maintenance budget (the costs indicated are 2019 figures).



Image: Newhaven, Piara Waters



## New Developments and Western Australian Planning Commission

A very simplistic review of the City Asset data shows irrigation infrastructure is less common within the central band of the City; Armadale, Camillo, Brookdale, Seville Grove, Champion Lakes. Refer Image 2. A number of areas within these suburbs were developed before Western Australian Planning Commission (WAPC) conditioned the requirement for developers to provide Public Open Space landscaping and establishment maintenance.

For any new development the following condition(s) generally applies:

*"R4 - Arrangements being made for the proposed public open space to be developed by the landowner/applicant to a minimum standard and maintained for two summers through the implementation of an approved landscape plan providing for the development and maintenance of the proposed public open space in accordance with the requirements of Liveable Neighbourhoods and/or dark sky principles [DELETE AS APPLICABLE] and to the specifications of the local government. (Local Government) Ra2 - With regard to Condition [INSERT VALUE], the development is to include full earthworks, reticulation, grassing of key areas, and pathways that form part of the overall pedestrian and/or cycle network."*

The requirement for Developers to provide basic landscaping and reticulation (irrigation) ensures that reserves provide year round amenity and reduces the burden on Local Government Areas to outlay funds for capital works. This WAPC condition is relatively new (post year 2000) and older developments were not required to provide this level of amenity.

The City of Armadale has a number of reserves that were simply ceded free of cost with minimal landscape treatments provided.



Image 2; City of Armadale – Irrigation Infrastructure. Irrigation infrastructure as shown by blue dot. There is a higher concentration of irrigation infrastructure in the newer suburbs Piara Waters and Harrisdale compared to the established suburbs of Camillo, Seville Grove, Champion Lakes and Kelmscott



Image: Barry Poad, Seville Grove



# Internal Benchmarking

## How are our Parks irrigated?

The City of Armadale irrigates reserves using the following sources:

### A) Groundwater

The majority of the City's reserves are irrigated from groundwater extracted from bores. The groundwater is sourced from the Superficial Aquifer or Leederville Aquifer. Both of these aquifers are currently fully allocated in the 'City of Armadale' sub-area. The 'City of Armadale' sub-area is where a large portion of the City's dry parks are located.

To accommodate any new irrigated parks within the 'City of Armadale' sub-area, the City will need to consider hydrozoning other parks (in the same sub-area) to balance the total water usage, or consider other improvements.

There is allocation available in the 'Wright' sub-area (Superficial aquifer) which covers Piara Waters. The majority of parks are sufficiently irrigated in this area as they have been developed over the past 10 years, and the minimum standard has been achieved through the application of the WAPC condition previously mentioned.

The City is not able to trade between sub-areas.

Refer Attachment A for groundwater aquifer boundaries.

In addition to the allocation issues described above, there are additional issues relating to the use of groundwater that need to be considered and monitored, including but not limited to:

- Salinity
- Iron (Fe)
- Abnormal pH
- Flow
- Long term viability
- DWER allocation (7,500kL/hect/yr to 6,500kL/hect/yr)

### B) Irrigation Scheme connections

The City has a limited number of parks irrigated via a scheme water connections. This option was selected if there were no other options available and the irrigated area is extremely limited.

Borello Park (Roleystone), Tredale Field (Mount Richon) and Erica Park (Kelmescott) are irrigated via scheme water. In all instances no other irrigation sources were available and given the lack of irrigated space in the areas, it was deemed a reasonable option.

Irrigating via scheme water has economic and environmental issues, and is a last resort option.

### C) Irrigation tanks

There are 13 reserves which require tanks due to insufficient yield to feed the irrigation system.

These tanks are filled from the nearby groundwater bore, and in some instances (for example Cross Park), the City is forced to supplement with scheme water to meet the demands of the particular reserve.



## Heat Mapping

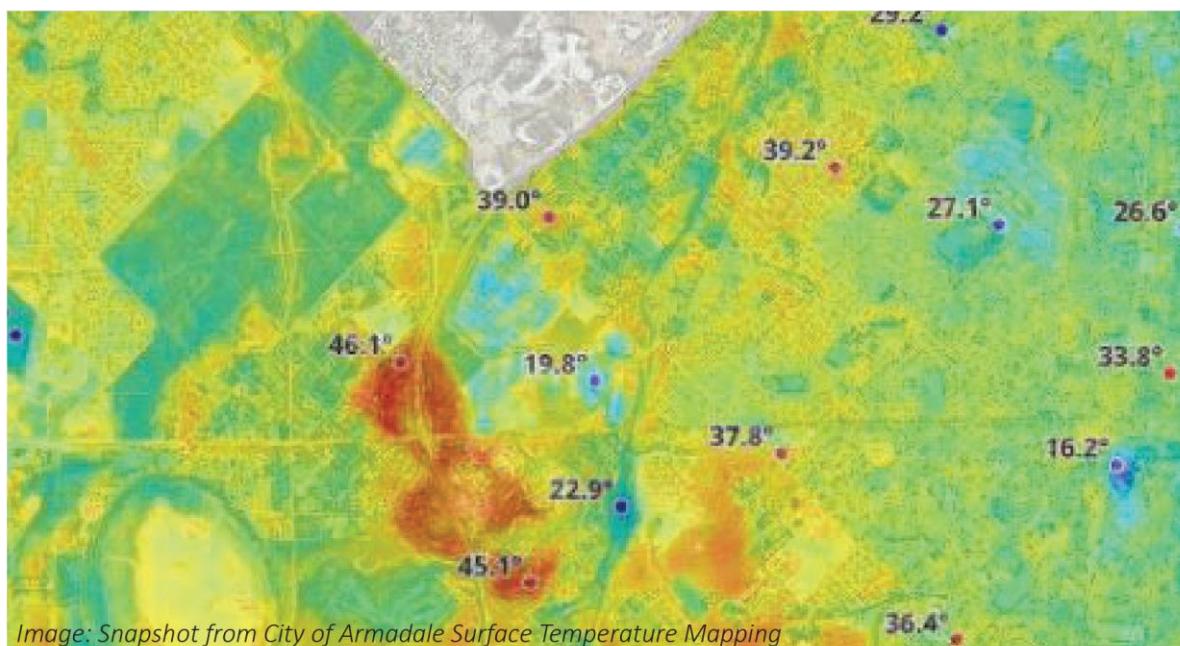
The City of Armadale engaged a specialist in 2019/2020 to complete and analyse near-infrared data (year 2020) and capture thermal imagery using satellite images. The analysis identified the extent of the City's existing tree canopy and vegetation cover, and identified hot spots within the City. It is intended to be a benchmark against which the City can measure the success and impact of the City's Urban Forest Strategy.

From a dry park perspective and a very high level review of the heat mapping, it has been identified that there is a 2 to 8 degree difference between dry and irrigated parks. (Refer table 2- Surface Temperature Dry Park v Irrigated Park).

The heat mapping has clearly outlined the local temperature reduction trees provide, and at a closer surface level it also identifies irrigated reserves are lower in temperature. The lower temperature contributes to their overall appeal and usability to the community.

*Table 2:  
Surface Temperature Dry Park v Irrigated Park*

PARK NAME	SUBURB	SURFACE TEMP	IRRIGATED (YES / NO)
TICKLIE RESERVE	SEVILLE GROVE	35.70	NO
PELHAM RESERVE	ARMADALE	34.00	NO
DAMERHAM PARK	KELMSCOTT	33.10	NO
WESTFIELD HERON	CAMILLO	38.50	NO
MINNAWARA	ARMADALE	27.70	YES
ASPIRI PARK	PIARA WATERS	31.00	YES
WILLIAM LOCKARD RESERVE	HARRISDALE	30.60	YES





## The Benefits of Irrigation

Water is not an infinite resource and its usage needs to be carefully considered and monitored, however it is also important to consider the benefits of an irrigated reserve.

Irrigation supports the health and longevity of trees, shrubs and turf, and is vital to provide optimal green infrastructure. The Western Australian climate is hot, dry and windy. This is a harsh environment in which planting and turf has to thrive, particularly if it is not irrigated.

Irrigation of turf allows for optimal growth and ensures the turf can be used year round for recreational activities. Turf that is not irrigated dies off during the summer months, is hard, spiky and the area is often dusty. This prevents year round usage.

The majority of planting within the City of Armadale is native (Endemic, Western Australian or Australian natives), which require less water than exotic alternatives, however irrigation does support initial growth and maintains a quality that presents well to the community.

## Hydrozoning Benefits

Hydrozoning is the optimizing of an irrigation system, to group elements that require similar watering schedules to reduce overall water usage.

Hydrozoning is also the reduction of water usage through the removal of irrigation and associated landscape treatment, and replacing with an alternative landscape surface, such as winter (non-irrigated) planting that requires less water. This shall only occur where the function of the reserve and the extent of irrigation do not align.

For example; Ashworth Park which is predominantly a turfed swale. Turf is not an appropriate surface treatment for a drainage swale and the reserve and broader drainage system would benefit from this reserve being planted with non-irrigated planting.

Hydrozoning irrigated reserves provides opportunity to utilize 'saved' water in other reserves which require water for irrigation purposes. This is quite critical in the 'City of Armadale' sub-area which is fully allocated (as described in the 'How are our Parks irrigated? section). Any existing dry parks within the City of Armadale sub-area will more than likely require water allocation from hydrozoning projects.



Image : Pelham Reserve, Armadale



# Analysis

## City of Armadale Parks Analysis - Dry Parks

To develop the improvement frameworks, a review and analysis of the City's reserves was undertaken in relation to the below criteria and the Detailed Parks Analysis Table is attached (refer Attachment B).

- Reserve Name
- Parks Facilities Classification
- Reserve Maintenance Classification
- Is the reserve currently irrigated? (Yes or No)

If the answer was 'No'; the reserve is not irrigated, and the following factors were assessed (per reserve) to refine the Dry Park Improvement Framework.

Are there any other planned improvements for this reserve?

*This was determined by reviewing any recent (last year) or proposed upcoming works in the reserve. It is preferable to align park improvements as this provides greater visual impact for the community, improves the usage for the community and optimizes project funding by combining project upgrades.*

- If 'Yes' – Score of 5
- If 'No' – Score of 0

### What is the 'Need' for improvement?

*This was determined by reviewing the reserves Park Classification and if the reserve was in a classification that requires irrigation.*

- Reserve is classified for irrigation – High 'Need' score of 10
- Reserve is classified for irrigation but the existing reserve function reduces the requirement for irrigation – Medium score of 5
- Reserve is not classified for irrigation – Low 'Need' score of 1

### Is there a water source available?

*This was determined by the following rationale:*

- No water source available – Low score of 1
- Water source may be available or further investigation required – Medium score of 5
- Water source and water available – High score of 10



Image: Ashworth Park, Brookdale



## City of Armadale Parks Analysis - Dry Parks and Hydrozoning

**Will other improvements increase the quality of the reserve?**

*This was a visual review and assessment of the reserve:*

- Environmental improvements such as drainage planting or bushland revegetation – High score of 10
- Recreational improvements such as playgrounds, park furniture and paths- Medium/High score of 7
- Planting improvements such as street tree planting – Medium score of 5

Refer to the 'Options for Improvement' section in this strategy for further information on Hydrozoning.

This review is intended to firstly identify the dry parks and then assess them against the above criteria. The reserves are then ranked in order of priority (highest score to lowest score) to identify the priority reserves for Dry Park improvements.

As part of the detailed parks analysis, hydrozoning existing irrigated reserves was also considered. To consider hydrozoning the following scenarios were considered:

- Are there irrigated reserves with irrigated turf, but the turf is not necessarily performing a suitable recreation function?
- Are there irrigated reserves where the water is 'spread too thin' and not providing a quality surface?
- Are there any dry parks that may benefit from the water saved through hydrozoning?

In the Parks Analysis review, if the answer was 'Yes' to 'Is the reserve currently irrigated?'; the reserve was visually reviewed and assessed if it were appropriate for Hydrozoning.



Image: Paterson Park, Kelmscott



## City of Armadale Parks Analysis- Hydrozoning

The following factors were assessed per reserve to refine the Hydrozoning Improvement Framework.

Are there any other planned improvements for this reserve?

*This was determined by reviewing any recent (last year) or proposed upcoming works in the reserve. It is preferable to align park improvements as this provides greater impact and aligns*

- If 'Yes' – Score of 5
- If 'No' – Score of 0

What is the 'Need' for water saving (ie. is water not being optimally used)?

*This was determined by visually reviewing the irrigated area, considering what surface was being irrigated and what the overall function of the reserve was.*

- Low need- score of 1
- Medium need- score of 5
- High need- score of 10

Is the reserve is hydrozoned, would there be any water savings?

- The hydrozoning will result in improvements in the POS only (no water saving) – Low score of 1
- The hydrozoning will result in water saving, further investigation required to ascertain where the water can be used – Medium score of 5
- The hydrozoning will result in water saving that can be utilized in reserves currently scheduled for improvement (through the Dry Parks Improvement Framework or other scheduled improvements)- High score of 10



Image: Bernice Hargraves Reserve, Kelmscott



## Options for Improvement

The analysis of the City reserves (Attachment B) considered 'Options for Improvement'.

Given the precious nature of water, it is not simply appropriate to irrigate all dry reserves from groundwater or scheme water. Alternative options needed to be considered.

All options for improvement are summarized below:

### A. Irrigate the reserve via groundwater bore

#### Description

Where there is an available allocation, consider installing a new bore or connecting into an existing near-by bore to irrigate the dry reserve.

#### Application

This option will need to consider the relevant ground water licenses, existing bores and potential new bore locations. The new irrigation system will connect into the new or existing bore and use water abstracted from the relevant aquifer.

#### Cost

The cost of this option will vary greatly depending on site specific requirements.

- The cost of a new bore and associated headworks etc is between \$40k and \$80k
- The cost of the irrigation system will vary depending on the irrigated area

### B. Hydrozoning (Hydrozoning of reserve to better use water on the same reserve)

#### Description

Re-prioritise the area of irrigation. *For example – reduce the area of irrigated turf to improve the quality of the turf in a specific area. Focusing more water on the smaller turf area. The other area may be planted with native plants and trees where water usage can be scaled back.*

#### Application

This option is limited to the irrigated reserve itself (ie. Will not benefit a nearby dry park), but will improve the quality of reserve by better using the water in a reduced area.

#### Cost

The cost of this option will vary greatly depending on site specific requirements. This option is not a suitable option for dry park improvements, but should be considered for ongoing water usage improvements across the City.

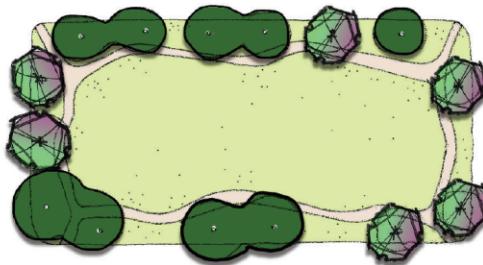


Image 3a – Example Reserve Before

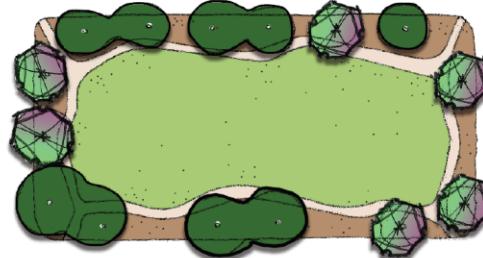


Image 3b - Example Reserve After Hydrozoning



## Options for Improvement continued

### C. Hydrozoning (Hydrozoning a reserve to save water and use elsewhere)

#### Description

Reduce the irrigated area on an existing irrigated reserve. The water allocation saved on this reserve can be utilised on a nearby dry park.

#### Application

This option will require the following:

- Rectification works on the irrigated reserve (eg. irrigation adjustments, tree planting / native shrub planting and mulch to the area of reduced irrigation)
- Installation of irrigation infrastructure between the irrigated reserve and the dry park (eg. mainlines, upgrades to source)
- New works to dry reserve (eg. irrigation system and new surface treatments – turf and planting), along with other improvements if required.

#### Cost

The cost of this option will vary greatly depending on site specific requirements.

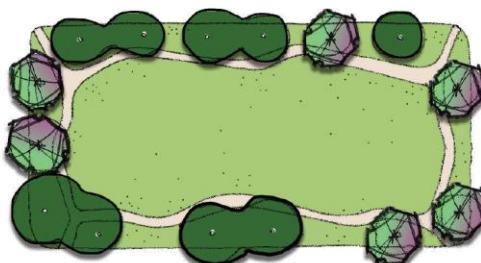


Image 4a – Example Irrigated Reserve Before

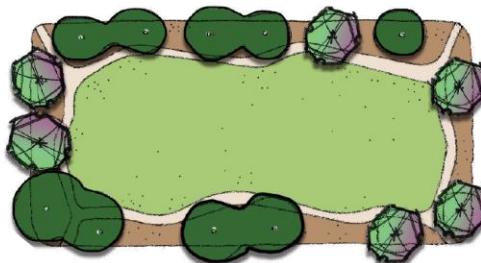


Image 4b – Example Irrigated Reserve After Hydrozone

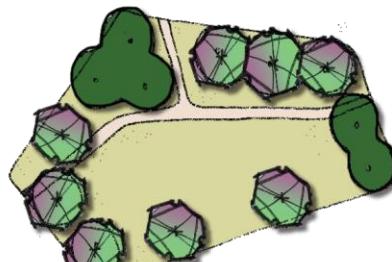


Image 4c – Example Dry Park Before Hydrozone

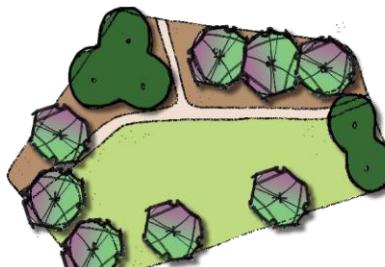


Image 4d – Example Hydrozoned Park After



## Options for Improvement continued

### D. Irrigation System Improvements

#### **Description**

Review and audit existing irrigation systems to determine improvements and appropriate water budgeting that may reduce water usage. The water saved through irrigation system improvements may be used on the reserve itself as per B – Hydrozoning (Irrigated Park based) or C – Hydrozoning (Irrigated Park to Dry Park).

Improvements to be considered in the audit include centralised control systems, water budgeting, irrigation scheduling, soil moisture monitoring, irrigation design standards and turf maintenance.

#### **Application**

This option is wide and varied in its application.

#### **Cost**

It is recommended that a separate audit is completed of the City's passive reserve irrigation systems to understand usage, determine improvements and appropriate water budgeting.

### E. Scheme Water connection

#### **Description**

If all other viable water source options are exhausted, the proposed irrigated area is limited and the need for irrigated space is high, the option to connect to scheme water may be considered.

This option is not preferred and is limited in its application.

#### **Application**

This option will require the site to be fitted with a suitable water connection through the Water Corporation. The proposed irrigation system will connect into this water connection and usage will be monitored, recorded and charged by the Water Corporation. The City of Armadale will be required to pay for this cost on an ongoing basis.

#### **Cost**

- Scheme water connection costs to the Water Corporation can vary up to \$10,000 per application (meter box, application fee, service activation and water contribution)
- Ongoing water usage charges will be charged to the City direct.
- The cost of the irrigation system will vary depending on the irrigated area.



## Options for Improvement continued

### F. Treated Waste Water\*

#### **Description**

Utilisation of treated waste water (non-drinking) to irrigate public open space.

#### **Application**

This requires the installation of treatment system(s) and 'Third Pipe' system to capture grey water, treat grey water and supply water to public open space irrigation systems.

#### **Cost**

This option requires more investigation and is not a suitable option for implementation in the short-term. It may be an option for future improvements following a capital investment into a Treated Waste Water Study.

### G. Managed Aquifer Recharge (MAR)\*

#### **Description**

Managed aquifer recharge is the process by which water is taken from surface sources such as stormwater drains, and is used to either actively or passively recharge the aquifer. This water is then available for future use.

#### **Application**

This option will require identification of a surface source. This source will need to be studied prior to any harvesting to ensure that any water taken from the surface and recharged into the aquifer is not contributing to any negative effects on the surface.

#### **Cost**

This option requires more investigation and is not a suitable option for implementation in the short-term.

The City has engaged Water West Pty Ltd to complete a feasibility of a waste water / managed aquifer recharge system for the Wungong Masterplan Area. This project is ongoing.

### H. Stormwater Harvesting\*

#### **Description**

Runoff from urban infrastructure or existing stormwater drains can be collected for irrigation, however, storage of the water for use in the drier months can be expensive due to the need for large tanks or underground storage cells.

#### **Application**

This option requires the installation of storage cells / tanks to store the run-off water for irrigation purposes. The size of the tanks is generally extremely large, and the cost/benefit is not feasible.

#### **Cost**

This option is currently cost prohibitive but shall remain an option should infrastructure costs lower.

### I. Subsurface drainage harvesting\*

#### **Description**

A potential water source for developments on low-lying land is harvesting water from subsurface drainage that has been installed to control rising groundwater levels. Research has shown that subsurface flows are sufficient for direct diversion for POS irrigation without the need for off-season storage at certain sites on the Swan Coastal Plain.

#### **Application**

This option requires site specific monitoring and modelling to ensure a reliable source in the drier months when it is most required (Davies et al., 2016).

#### **Cost**

This option requires more site specific monitoring and modelling, and is not a suitable option for implementation in the short-term.



## Options for Improvement continued

### J. Non-irrigated planting enhancements

#### **Description**

This option may be used to environmentally improve a dry park, but will not require the ongoing water for irrigation purposes.

#### **Application**

This option will need to be undertaken at the appropriate time of the year, and will provide environmental benefits to the reserve. The planting shall be endemic and may be completed with advice from City Environmental Services and City Bushcare Supervisor.

#### **Cost**

- Soil improvement, if required, is approximately \$4/sq.m
- Tubestock (supply and installed) is approximately \$3.50 each
- Ideally any non-irrigated planting will be completed after the first rains (May / June) and will benefit from the cooler winter months after installation. Supplementary truck / hand watering may be required to provide optimal growth in the first and/or second
- There may be costs associated with additional site works, watering and maintenance. These are site specific costs.

### K. Other Enhancement Options

#### **Description**

This option considers other improvements that may improve the recreational value of the park, without using irrigation.

#### **Application**

This option is highly varied and site specific, but may include pathways, fencing, furniture, playground, exercise equipment and/or signage.

#### **Cost**

The cost of this option will vary greatly depending on site specific requirements

\*Information regarding Treated Waste Water, Managed Aquifer Recharge, Stormwater Harvesting and Sub-surface Drainage Harvesting has been extracted from the City's internal operational document 'Position Paper on Water Management for Parks Irrigation 2021'.



## Options for Improvement Summary

The options for immediate improvement of dry parks and for inclusion in the Dry Park Improvement Frameworks includes:

- A- Irrigate the reserve via groundwater bore
- B- Hydrozoning (Hydrozoning of a reserve to better use water on the same reserve)
- C- Hydrozoning (Hydrozoning of irrigated reserve to save water for use elsewhere)
- E- Scheme Water connection
- J- Non-irrigated planting enhancements
- K- Other Enhancement Options

Further study, investigation and capital investment is required prior to the following options being considered:

- D – Irrigation system improvements
- F - Treated Waste Water,
- G- Managed Aquifer Recharge (MAR)
- H- Stormwater Harvesting
- I- Subsurface drainage harvesting



Image: Massell Park, Brookdale



## Improvement Frameworks

The frameworks identify the following as priority projects:

- 9 x Dry Park Improvement Projects
- 10 x Hydrozoning Improvement Projects

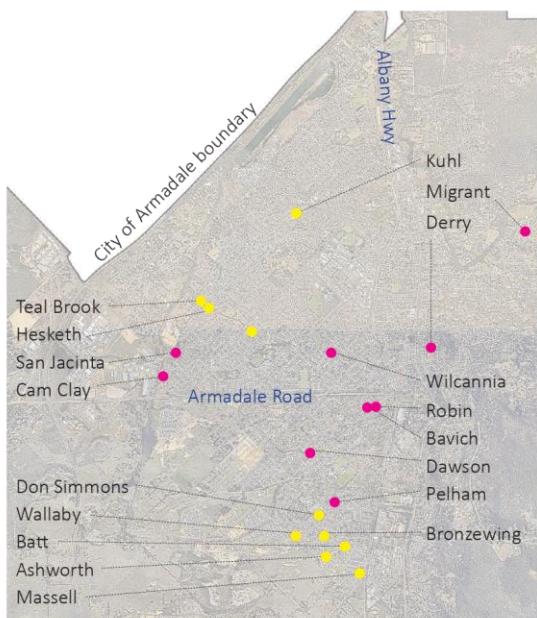
As the high level review indicated, the majority of the dry parks are located in the central band of the City and the priority Dry Park Improvement projects are located in this band. Refer Image 5- Project Mapping.

The ranking system prioritised projects with existing improvements scheduled or projects where works have just been completed. This enables improvements to be focused and concentrated.

The projects have been staged across 5 financial years to balance capital expenditure, allow appropriate time for design, documentation and pricing, and stage any increased maintenance budgets.

The projects and estimated budgets have been summarised on *Table 3 - Dry Park Improvement Framework and Hydrozoning Improvement Framework*

Refer Attachment C – Improvement Frameworks for additional details.



*Image 5 – Project mapping for project locations (DPIF - PINK / HIP - YELLOW)*

## Dry Park Improvement and Hydrozoning Improvement Frameworks

Dry Park Improvement Framework		Proposed Staging and Funding (additional to any proposed LTFP funding) (Subject to further review as detail is obtained regarding water source)							Estimated Increase to the Yearly Maintenance Cost
Reserve Name		2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029	
Bavich Reserve	Implementation Planning	D+D	\$ 50,000						\$ 2,130
Robin Park		D+D	\$ 50,000						\$ 2,485
Wilcannia / Toongabbie Park			D + D	\$ 150,000					\$ 7,285
Pelham Reserve					D + D	\$ 150,000			\$ 8,952
Migrant Park					D + D	\$ 150,000			\$ 34,857
Derry Reserve					D + D	\$ 150,000			\$ 18,302
San Jacinta Reserve					D + D	\$ 100,000			\$ 16,172
Dawson Reserve					D + D	\$ 150,000			\$ 11,173
Cam Clay Reserve							D + D	\$ 150,000	\$ 16,920
Hydrozoning Improvement Framework		Proposed Staging and Funding (additional to any proposed LTFP funding) (Subject to further review as detail is obtained regarding water source)							No change due to hydrozoning
Reserve Name		2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029	
Ashworth Park	Implementation Planning	D+D	\$ 30,000						
Batt Park		D+D	\$ 30,000						
Corondale Park			D + D	\$ 200,000					
Don Simmons Reserve				D + D	\$ 100,000				
Teal Brook Park					D + D	\$ 75,000			
Kuhl Park					D + D	\$ 75,000			
Hesketh Park					D + D	\$ 75,000			
Massell Park							D + D	\$ 75,000	
Bronzewing Reserve				D + D	\$ 75,000				
Wallaby Reserve			D + D	\$ 75,000					

NOTE: The estimated costs do not include improvements in the other POS where water may be utilised.

\$ 160,000	\$ 650,000	\$ 425,000	\$ 450,000	\$ 225,000	\$ 118,275
TOTAL Proposed Dry Park Improvement + Hydrozoning Improvement (excl. GST)					\$ 1,910,000

### Irrigation Audit

Task	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029	
Irrigation Audit	\$ 40,000							

Notes:

1: Westfield Heron ranked 3 in the Dry Park Improvement Framework, however given the extent of upgrade proposed for 2021 no further works are proposed at this stage

2: D + D = Design and Documentation year

3: All of the parks listed in the Hydrozoning Improvement Framework are located within the City of Armadale sub-area (fully allocated, therefore water sourcing to be reviewed)



# Conclusion

## Conclusion

This Strategy has analysed the City's reserves, with particular focus on the dry reserves, and considered various methods of improvement.

Improvement options ranged from various water sourcing methods, irrigation improvements, recreation or environmental improvements or no improvements.

It was determined the appropriate methods of improvement as part of this strategy are:

- Recreational or environmental improvements
- Irrigation installation (pending investigation of water source and water availability)
- Hydrozoning

Hydrozoning an existing irrigated reserve allows for water to be saved, and additional water allocation to be utilized in other reserves that are either dry or do not receive sufficient water allocation to optimally irrigate.

Through a scoring and ranking system the Dry Park Improvement Framework and Hydrozoning Improvement Framework have been established. These frameworks are intended to guide the improvement of the top ranked parks over a five year period commencing from 2024/25. The next two years will be used for planning, design and documentation.

In addition to the Improvement Frameworks, a City wide audit of the existing irrigation systems in passive reserves is required and proposed to be completed during the 2022/23 financial year. This audit shall document the existing usage, determine improvements and appropriate water budgeting. This information will inform future reserve improvements.

It is important that the Dry Parks Strategy is reviewed and updated every five years to address potential improvements in technology, standards and practices.



Image: Skeet Memorial, Forrestdale



Image : Newhaven, Piara Waters



# Appendix 1

## Example A- Need

### Example A - How is 'Need' determined in the Dry Park Framework?

In determining the Dry Park Improvement Framework we ascertained the 'Need' for improvement and this relates directly to the irrigation 'facility type'.

The City reviewed all of the reserves and noted if they were unirrigated. If a reserve was unirrigated and classified Local Recreation, Neighbourhood Recreation, Neighbourhood Sport, District Recreation and District Sport, their 'Need' score was High (max score of 10).

*For example, Bavich Reserve is a Local Recreation Reserve that is not irrigated. As a Local Recreation Reserve, it is recommended to be irrigated and therefore received a High 'Need' score of 10.*

Not all of the dry parks will need to be considered for improvement as they may already meet the needs of their particular park classification system or other factors may limit improvement.

*For example, Gemsarna Reserve is a Local Recreation Reserve that is not irrigated. As a Local Recreation it is recommended to be irrigated, however it is highly landlocked reserve, provides no other facilities (eg. playground, seating, paths) and is located in close proximity to Migrant Park (also a dry park) which does have other facilities and where irrigation would be better focused. Gemsarna Reserve therefore received a Low 'Need' score of 1.*

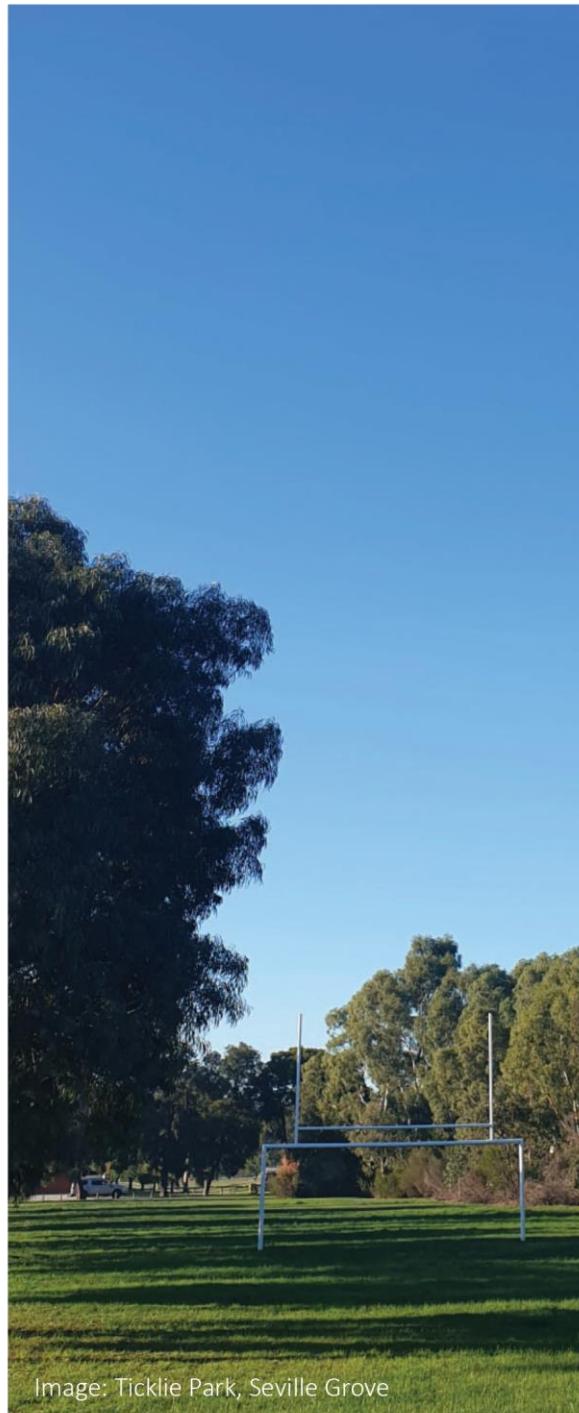


Image: Ticklie Park, Seville Grove



# Appendix 1

## Example B- Dry Park Improvement

### Example B – How a Park was assessed as part of the Dry Park Improvement?

An example of a reserve assessed for Dry Park Improvement:

Damerham Park is a Local Recreation reserve that is not irrigated. It has a small playground and is located in Kelmscott in close proximity to the train line. Damerham Park was assessed against the Dry Park categories as outlined below:

*1. Is this reserve included in the PIP or Next Priorities?  
Yes (score of 5)*

*2. Is this reserve part of other recent or upcoming projects, upgrades or renewals?  
No (score of 0)*

*3. What is the Need for Improvement?  
High, as a local recreation reserve, irrigation is a highly recommended facility (score of 10)*

*4. Is there an available Water Source?  
Further investigation of a water source is required, based on a desktop review there is limited availability (score of 5)*

*5. Will other improvements increase the quality of this reserve?  
Yes Damerham will benefit from environmental improvements and recreation improvements (score of 17)*

Based on the analysis, Damerham Park receives a score of 37, and is ranked 3 in the priority of improvement for Dry Parks.



Image: Newhaven, Piara Waters



# Appendix 1

## Example- Hydrozoning

### Example C – How a Park was assessed as part of the Hydrozoning Improvement?

An example of a reserve assessed for Hydrozoning Improvement:

Ashworth Park is a Local Recreation reserve located in Brookdale. Local Recreation areas are deemed suitable for irrigation, however this reserve is mainly an irrigated, turfed drainage swale. The City has a preference to treat stormwater through vegetated treatment swales. The planting is typically native sedges and rushes with an overstorey of tree planting. Based on this visual assessment, Ashworth Park is deemed suitable for hydrozoning and therefore the following categories were assessed:

*1. Are there any planned improvements for this reserve?*

*Yes (score of 5) Ashworth Park is part of the Park Improvement Plan and is scheduled for improvement in 2021/2022 (pending budget approvals)*

*2. What is the need for water saving? The ‘Need’ is High (score of 10) on the basis that the reserve has a mainly drainage function and the surface should be landscaped according to this function.*

*3. Will there be any water saved if hydrozoned?*

*Yes, water can be utilized at the nearby Harber Park which is scheduled for improvement in 2020 (score of 10).*

Based on the analysis, Ashworth Park receives a score of 25, and is ranked 1 in the priority of improvement for Hydrozoning.



Image: Ashworth Park, Brookdale

Image: Rossiter Playing Field playground, Piara Waters





# Attachments

## Attachments

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### Attachment A

#### Groundwater Aquifer Mapping

- City of Armadale sub-area
- Wright sub-area
- Perth confined sub-area
- Karri

### Attachment B

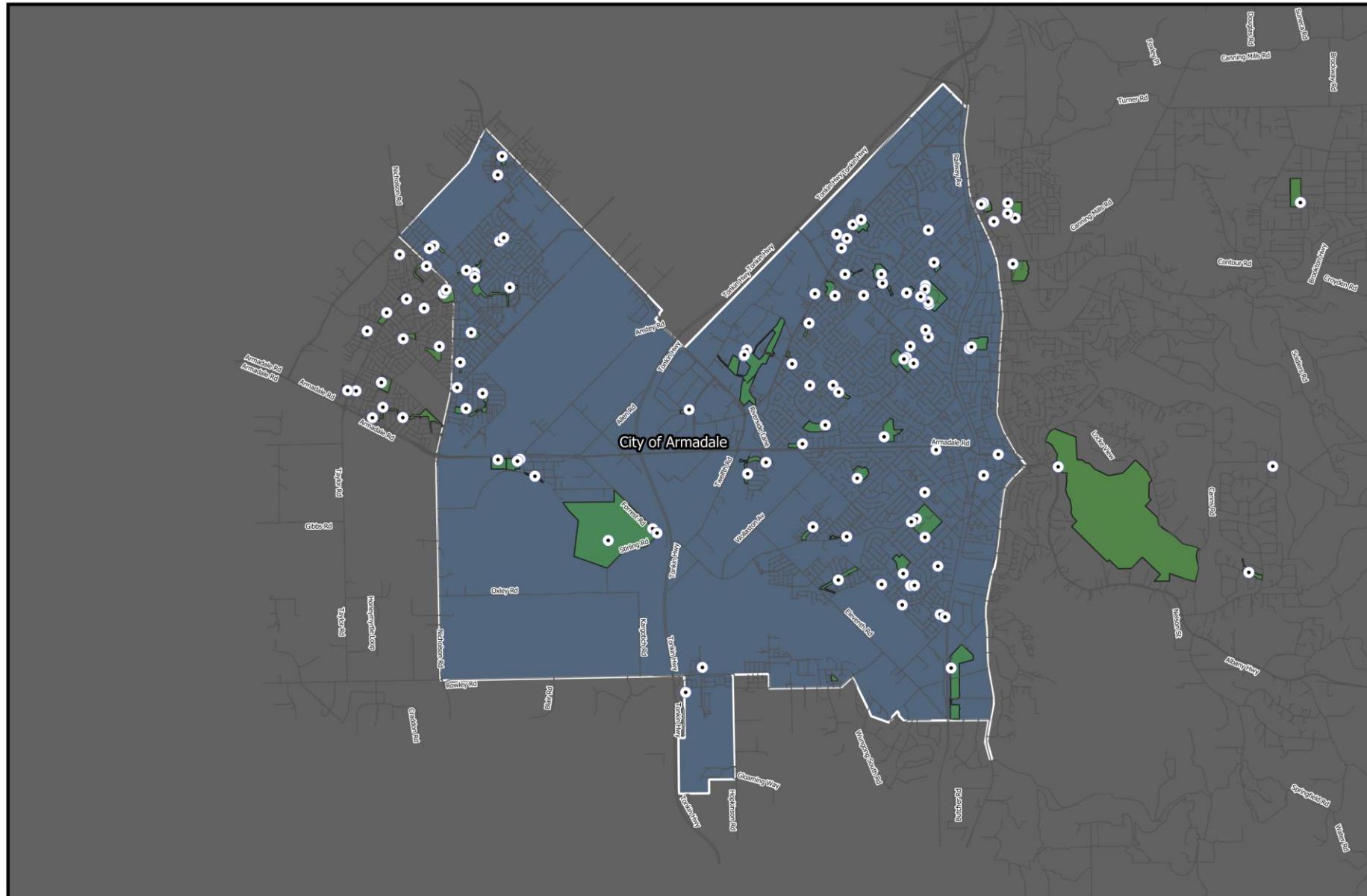
#### City of Armadale Detailed Parks Analysis Table

### Attachment C

#### Improvement Frameworks (detailed)

- Dry Park Improvement Framework
- Hydrozoming Improvement Framework

Attachment A - Groundwater Aquifer Mapping



City of Armadale - Bore Locations  
DWER - Groundwater Sub-Areas (Used under permission from DWER, not to be reproduced or copied without prior approval)



The City of Armadale takes no responsibility for inaccuracies within this drawing.

Scale 1:75000 @ A4 Landscape

12/02/2021

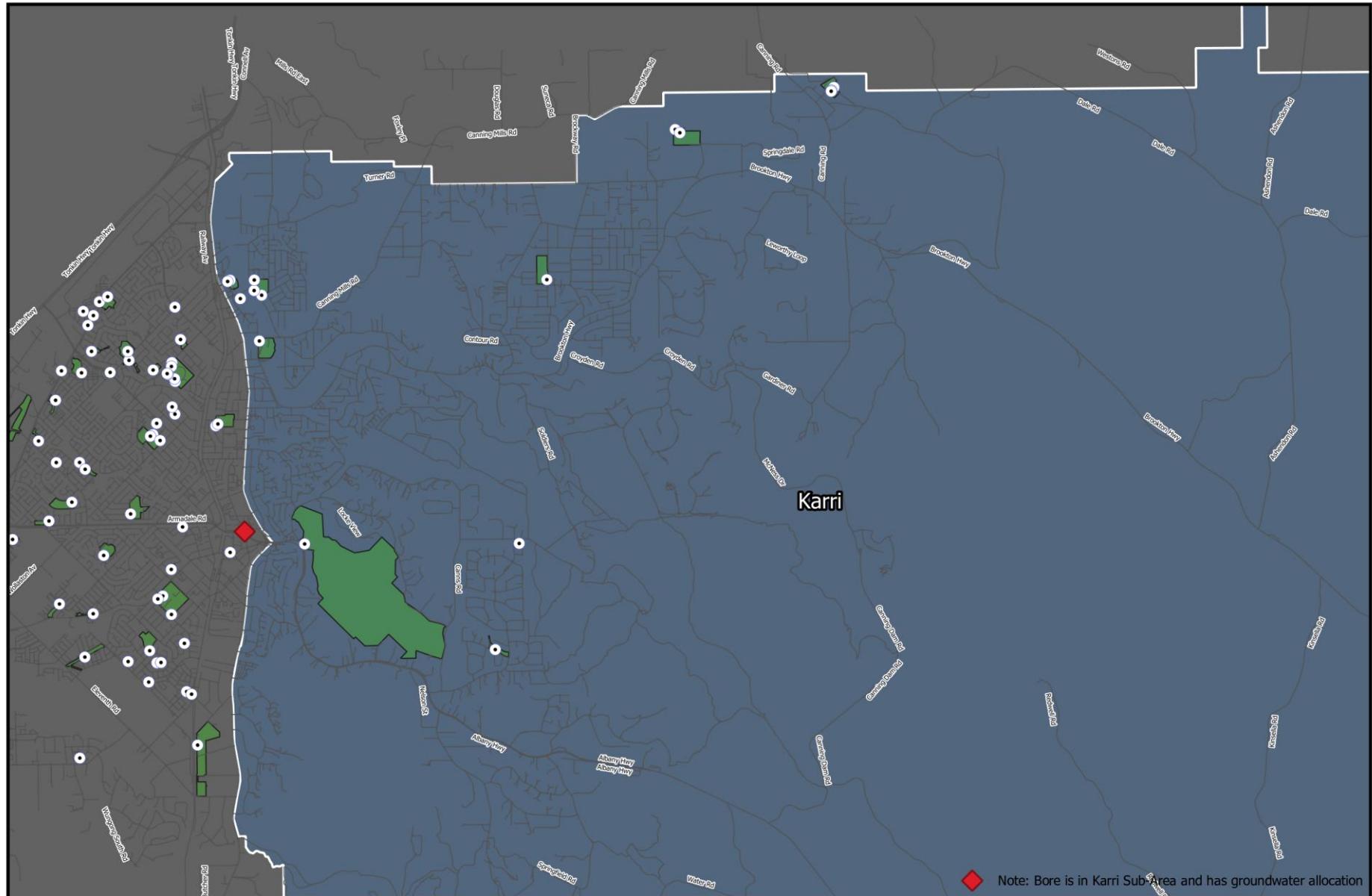
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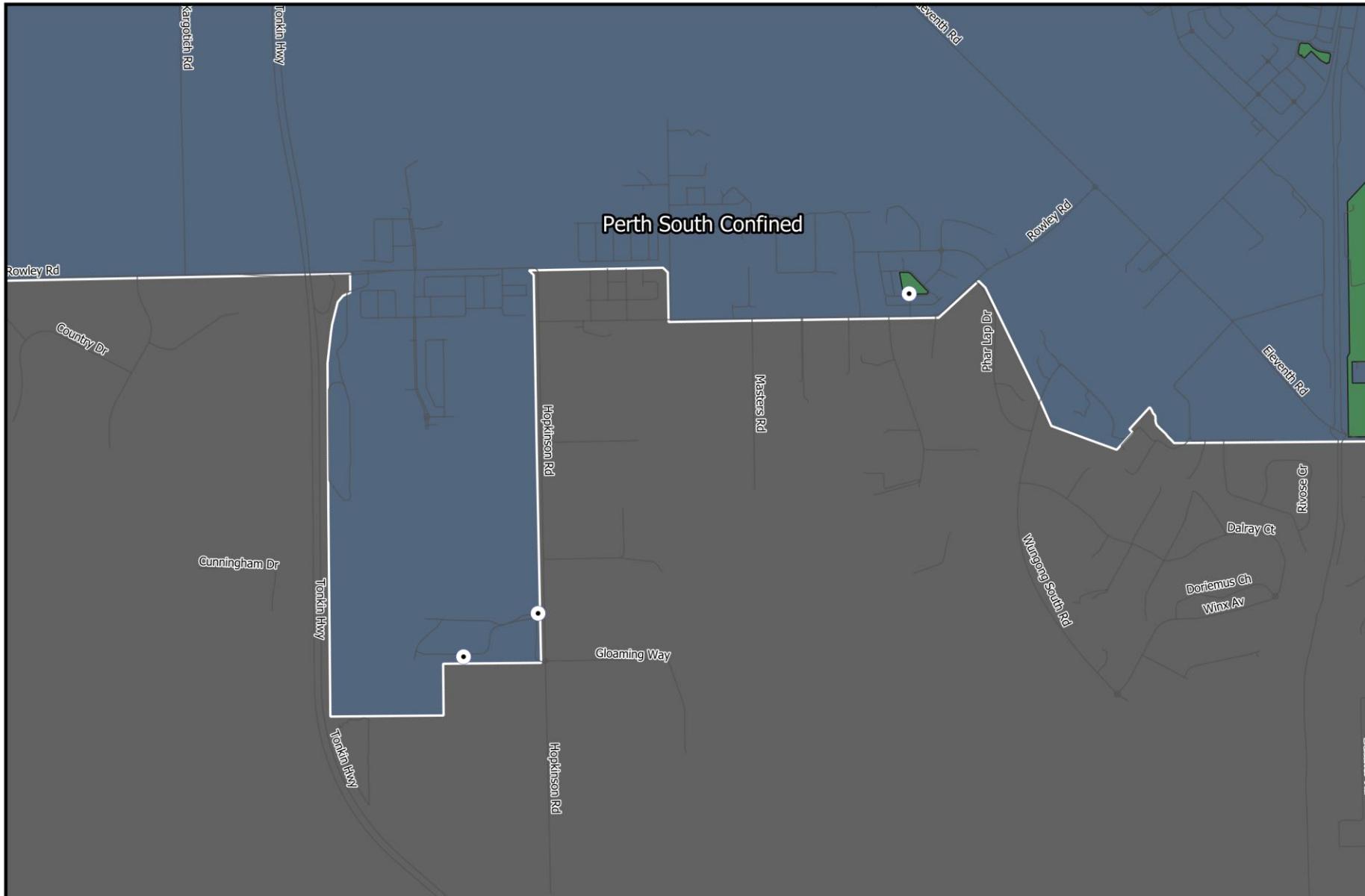
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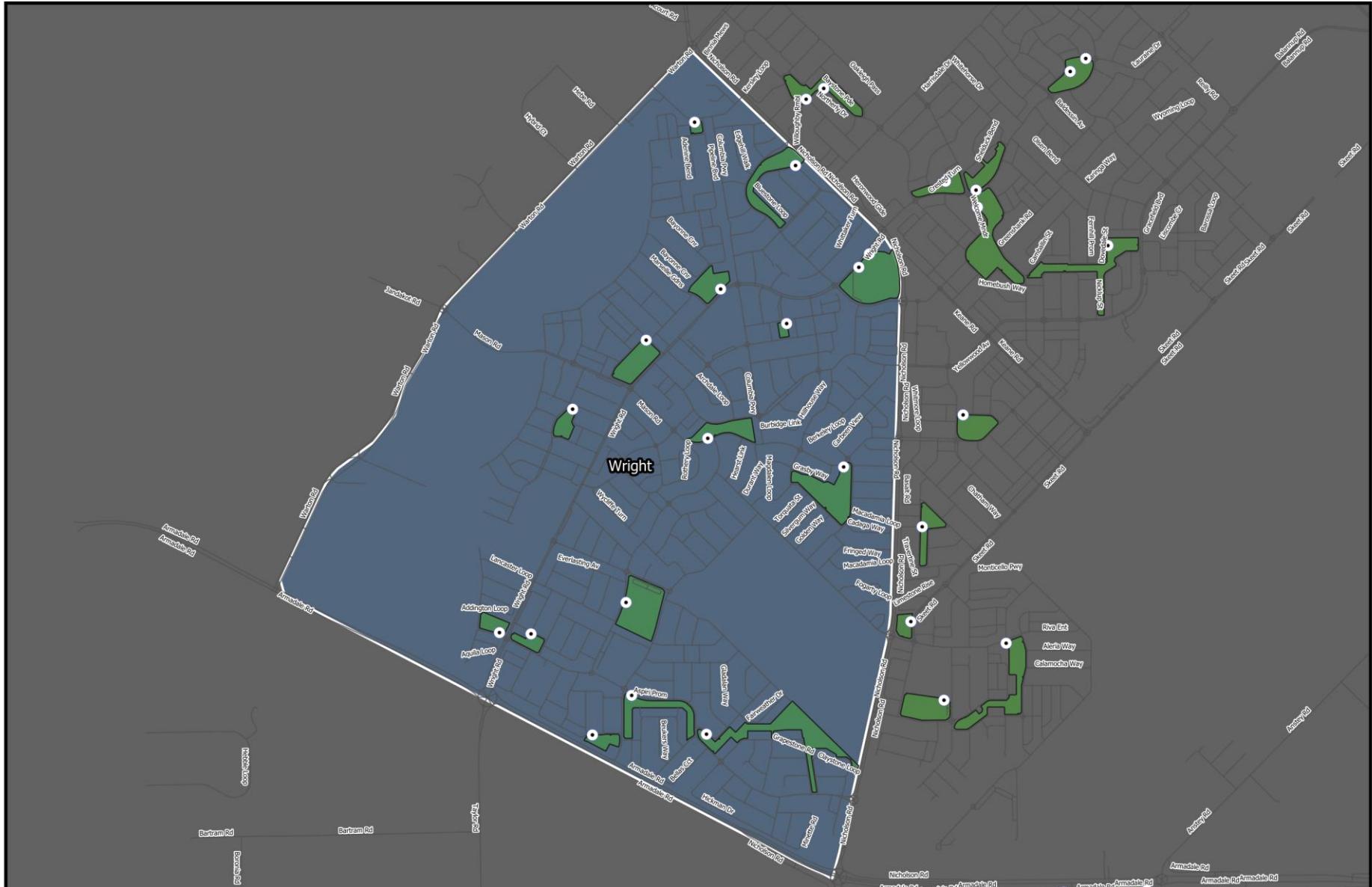
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City of Armadale - Bore Locations  
DWER - Groundwater Sub-Areas (Used under permission from DWER, not to be reproduced or copied without prior approval)



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Page 1 of 4

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Attachment B – City of Armadale Details Parks Analysis Table



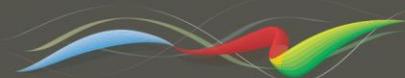


Attachment C – Dry Park Improvement Framework and Hydrozoning  
Improvement Framework

Dry Park Improvement Framework								Proposed Staging and Funding (in addition to any proposed LTIP funding) (Subject to further review as detail is obtained regarding water source)								Implementation Rating	Estimated Increase in the Yearly Maintenance Cost
Reserve Name	Reserve Number	Rank	PFS Classification	Maintenance Classification	Recent or upcoming other works	Current Proposed LTIP funding	Irrigation water source available or investigation required	Proposed Improvements	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Bavich Reserve	31596	1	Local Recreation	Passive Reserve Level 4 Dry	Yes in progress - 2021	Existing budget	Available	Irrigation and turf to enhance upcoming works	D+D	\$ 50,000						\$ 2,130	
Robin Park	34901	1	Local Recreation	Passive Reserve Level 4 Dry	Yes in progress - 2021	Existing budget	Available		D+D	\$ 50,000						\$ 2,485	
Wilamina / Tongabbie Park	31566	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 202/2023	\$50,000	Investigation required		D+D	\$ 150,000						\$ 7,285	
Pelham Reserve	36673	3	Neighbourhood Recreation	Passive Reserve Level 4 Dry	No works scheduled	\$0	Investigation required				D + D	\$ 150,000					\$ 8,952
Migrant Park	2121	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Yes completed - 2019	\$0	Investigation required				D + D	\$ 150,000					\$ 34,857
Derry Reserve	25699	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 202/2024	\$100,000	Investigation required				D + D	\$ 150,000					\$ 18,302
San Jacinta Reserve	41640	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 202/2024	\$150,000	Investigation required				D + D	\$ 100,000					\$ 16,172
Dawson Reserve	30165	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 202/2023	\$100,000	Investigation required				D + D	\$ 150,000					\$ 11,173
Cam Clay Reserve	51071	3	Regional Nature	Natural Area Wet	Wungong Walk Trail (part)	\$0	Investigation required				D + D	\$ 150,000					\$ 16,920
Hydrozoning Improvement Framework								Proposed Staging and Funding (in addition to any proposed LTIP funding) (Subject to further review as detail is obtained regarding water source)								Implementation Rating	No change due to hydrozoning
Reserve Name	Reserve Number	Rank	PFS Classification	Maintenance Classification	Recent or upcoming other works	Current Proposed LTIP funding	Where can water saved by utilised?	Proposed Hydrozoning	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Ashworth Park	43910	1	Local Recreation	Passive Reserve Level 3 Low	Proposed 2021/2022	\$100,000			D+D	\$ 30,000							
Batt Park	43920	1	Local Nature	Natural Area Dry	Proposed 2021/2022	\$50,000	Harber Park (requires additional allocation)	Reduce turf and increase swale planting	D+D	\$ 30,000							
Corondale Park	44185	3	Local Nature	Natural Area Dry	Proposed 2021	Existing budget			D+D	\$ 200,000							
Don Simmons Reserve	41611	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Yes - 2021	Existing budget				D + D	\$ 100,000						
Teal Brook Park	46675	6	Local Recreation	Passive Reserve Level 3 Low	No works scheduled	\$0	Barry Pool (currently a dry reserve with proposed improvements)	Reduce turf and increase tree planting/mulch areas			D + D	\$ 75,000					
Kuli Park	35636	6	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	No works scheduled	\$0	Water to be better utilised in Kuli	Potentially improvements in POS only			D + D	\$ 75,000					
Hesketh Park	46675	6	Local Nature	Natural Area Dry	No works scheduled	\$0	Barry Pool (currently a dry reserve with proposed improvements)	Reduce turf and increase planting			D + D	\$ 75,000					
Massell Park	49872	6	Local Recreation	Passive Reserve Level 3 Low	No works scheduled	\$0	Harber / Horrie Hill / Flematti	Reduce turf and increase basin planting			D + D	\$ 75,000					
Bronzewing Reserve	41316	6	Local Recreation	Passive Reserve Level 3 Low	Proposed 2022/2023	\$75,000	Harber / Horrie Hill / Flematti	Prioritise turf improvements			D + D	\$ 75,000					
Wallaby Reserve	41325	6	Local Recreation	Passive Reserve Level 3 Low	Proposed 2022/2023	\$75,000	Harber / Horrie Hill / Flematti	Prioritise turf improvements			D + D	\$ 75,000					
<small>NOTE: The estimated costs do not include improvements in the other POS where water may be utilized.</small>								<small>estimated increase in yearly maintenance cost</small>									
								<small>TOTAL Proposed Dry Park Improvement + Hydrozoning Improvement (excl GST) \$ 1,930,000</small>									
Irrigation Audit																	
Task	Reserve Number	Rank	PFS Classification	Maintenance Classification	Recent or upcoming other works	Current Proposed LTIP funding	Where can water saved by utilised?	Proposed Hydrozoning	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Irrigation Audit								\$ 40,000									

Notes:  
1: Westfield Heron ranked 3 in the Dry Park Improvement Framework, however given the extent of upgrade proposed for 2021 no further works are proposed at this stage  
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3: All of the parks listed in the Hydrozoning Improvement Framework are located within the City of Armadale sub-area (fully allocated), therefore water sourcing to be reviewed

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Dry Park Improvement Framework								Proposed Staging and Funding (in addition to any proposed LTIP funding) (Subject to further review as detail is obtained regarding water source)								Implementation Rating	Estimated Increase in the Yearly Maintenance Cost
Reserve Name	Reserve Number	Rank	PFS Classification	Maintenance Classification	Recent or upcoming other works	Current Proposed LTIP funding	Irrigation water source available or investigation required	Proposed Improvements	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Bavich Reserve	31596	1	Local Recreation	Passive Reserve Level 4 Dry	Yes in progress - 2021	Existing budget	Available	Irrigation and turf to enhance upcoming works	D+D	\$ 50,000						\$ 2,130	
Robin Park	34901	1	Local Recreation	Passive Reserve Level 4 Dry	Yes in progress - 2021	Existing budget	Available		D+D	\$ 50,000						\$ 2,485	
Wilamina / Tongabbie Park	31566	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 2022/2023	\$50,000	Investigation required		D+D	\$ 150,000						\$ 7,285	
Pelham Reserve	36673	3	Neighbourhood Recreation	Passive Reserve Level 4 Dry	No works scheduled	\$0	Investigation required				D+D	\$ 150,000					\$ 8,952
Migrant Park	2121	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Yes completed - 2019	\$0	Investigation required				D+D	\$ 150,000					\$ 34,857
Derry Reserve	25699	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 2023/2024	\$100,000	Investigation required				D+D	\$ 150,000					\$ 18,302
San Jacinta Reserve	41640	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 2023/2024	\$150,000	Investigation required				D+D	\$ 100,000					\$ 16,172
Dawson Reserve	30165	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Proposed - 2022/2023	\$100,000	Investigation required				D+D	\$ 150,000					\$ 11,173
Cam Clay Reserve	51071	3	Regional Nature	Natural Area Wet	Wungong Walk Trail (part)	\$0	Investigation required				D+D	\$ 150,000					\$ 16,920
Hydrozoning Improvement Framework								Proposed Staging and Funding (in addition to any proposed LTIP funding) (Subject to further review as detail is obtained regarding water source)								Implementation Rating No change due to hydrozoning	Estimated increase in yearly maintenance cost \$ 136,275
Reserve Name	Reserve Number	Rank	PFS Classification	Maintenance Classification	Recent or upcoming other works	Current Proposed LTIP funding	Where can water saved by utilised?	Proposed Hydrozoning	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
Ashworth Park	43910	1	Local Recreation	Passive Reserve Level 3 Low	Proposed 2021/2022	\$100,000	Harber Park (requires additional allocation)	Reduce turf and increase swale planting	D+D	\$ 30,000							
Batt Park	43920	1	Local Nature	Natural Area Dry	Proposed 2021/2022	\$50,000			D+D	\$ 30,000							
Corondale Park	44185	3	Local Nature	Natural Area Dry	Proposed 2021	Existing budget		Tickle Park (currently a dry reserve with proposed irrigation - requires additional allocation)	D+D	\$ 200,000							
Don Simmons Reserve	41611	3	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	Yes - 2021	Existing budget		Deerson Park / Pelham Reserve (dry reserve)	D+D	\$ 100,000							
Teal Brook Park	46675	6	Local Recreation	Passive Reserve Level 3 Low	No works scheduled	\$0	Barry Pool (currently a dry reserve with proposed improvements)	Reduce turf and increase tree planting/mulch areas			D+D	\$ 75,000					
Kuli Park	35636	6	Neighbourhood Recreation	Passive Reserve Level 2 Moderate	No works scheduled	\$0	Water to be better utilised in Kuli	Potentially improvements in POS only			D+D	\$ 75,000					
Hesketh Park	46675	6	Local Nature	Natural Area Dry	No works scheduled	\$0	Barry Pool (currently a dry reserve with proposed improvements)	Reduce turf and increase planting			D+D	\$ 75,000					
Massell Park	49872	6	Local Recreation	Passive Reserve Level 3 Low	No works scheduled	\$0	Harber / Horrie Hill / Flematti	Reduce turf and increase basin planting			D+D	\$ 75,000					
Bronzewing Reserve	41316	6	Local Recreation	Passive Reserve Level 3 Low	Proposed 2022/2023	\$75,000	Harber / Horrie Hill / Flematti	Prioritise turf improvements			D+D	\$ 75,000					
Wallaby Reserve	41325	6	Local Recreation	Passive Reserve Level 3 Low	Proposed 2022/2023	\$75,000	Harber / Horrie Hill / Flematti	Prioritise turf improvements			D+D	\$ 75,000					
<b>NOTE:</b> The estimated costs do not include improvements in the other POS where water may be utilized.																estimated increase in yearly maintenance cost \$ 136,275	
																TOTAL Proposed Dry Park Improvement + Hydrozoning Improvement (excl GST) \$ 1,930,000	
Irrigation Audit																	
Task	Reserve Number	Rank	PFS Classification	Maintenance Classification	Recent or upcoming other works	Current Proposed LTIP funding	Where can water saved by utilised?	Proposed Hydrozoning	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029		
<b>Irrigation Audit</b>																\$ 40,000	

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