Shire of Dardanup

Sustainable Development Directorate

APPENDICES

Item 12.2.1 – 12.2.2

ORDINARY COUNCIL MEETING

To Be Held

Wednesday, 23rd July 2025
Commencing at 5.00pm

At

Shire of Dardanup
ADMINISTRATION CENTRE EATON
1 Council Drive - EATON

This document is available in alternative formats such as:
~ Large Print
~ Electronic Format [disk or emailed]
Upon request.

RISK ASSESSMENT TOOL

OVERALL RISK EVENT: Place and Community Update (Events, Programs and YAG)

RISK THEME PROFILE:

6 - Community Engagement
Choose an item.

RISK ASSESSMENT CONTEXT: Operational

CONSEQUENCE CATEGORY	RISK EVENT	PRIOR TO TREATMENT OR CONTROL			RISK ACTION PLAN (Treatment or controls proposed)	AFTER TREATEMENT OR CONTROL		
		CONSEQUENCE	LIKELIHOOD	INHERENT RISK RATING		CONSEQUENCE	LIKELIHOOD	RESIDUAL RISK RATING
HEALTH	No risk event identified for this category.	Not Required - No Risk Identified	N/A	N/A	Not required.	Not required.	Not required.	Not required.
FINANCIAL IMPACT	No risk event identified for this category.	Not Required - No Risk Identified	N/A	N/A	Not required.	Not required.	Not required.	Not required.
SERVICE INTERRUPTION	No risk event identified for this category.	Not Required - No Risk Identified	N/A	N/A	Not required.	Not required.	Not required.	Not required.
LEGAL AND COMPLIANCE	No risk event identified for this category.	Not Required - No Risk Identified	N/A	N/A	Not required.	Not required.	Not required.	Not required.
REPUTATIONAL	Some community members may be unhappy with the change of event program.	Minor (2)	Possible (3)	Moderate (5 - 11)	Not required.	Minor (2)	Unlikely (2)	Low (1 - 4)
ENVIRONMENT	No risk event identified for this category.	Not Required - No Risk Identified	N/A	N/A	Not required.	Not required.	Not required.	Not required.
PROPERTY	No risk event identified for this category.	Not Required - No Risk Identified	N/A	N/A	Not required.	Not required.	Not required.	Not required.

Shire of Dardanup

SPRING EVENTS WORKING GROUP
2025/2026

INSTRUMENT OF APPOINTMENT
&
TERMS OF REFERENCE
2025

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1 AIMS

The Working Group will take a seasonal approach to enhancing event visibility, encouraging collaboration, and strengthening community engagement. This will apply to events delivered by both the Shire of Dardanup and external organisers, promoting a more connected and coordinated calendar of activities across the region.

2 OBJECTIVES

2.1 The Objectives of the Spring Events Working Group is to:
Act in an advisory capacity on matters relating to events taking place within the Shire of Dardanup during Spring 2025. This includes events delivered by both the Shire and external organisers.

3 MEMBERSHIP

3.1 The term of appointment for membership will be a period of Spring 2025 (3 months: September, October and November).

3.2 Community Representation:
Membership will be sought from the Shire of Dardanup Community. A maximum of eight (8) community representatives will be appointed from across the Shire.
Membership will be sought from the following Organisations:

- Ferguson Valley Marketing
- Bull & Barrel Festival Committee
- Ferguson Valley Visitors Centre
- Drive & Jive South West
- Other Groups may be added

3.3 Youth Advisory Group (YAG) Representation:
Membership will be sought from the Shire of Dardanup Youth Advisory Group. A maximum of two (2) YAG members will be appointed to join the Spring Events Working Group.

3.4 Shire Officers:
The Chief Executive Officer shall appoint an officer to liaise and manage the Working Group. It has been identified that this role will fall to Manager Community Development. Shire staff attending the Working Group will table papers for discussion and participate in the discussion. Shire Officers are not members of the Working Group and shall not vote.

3.5 Chair and Deputy Chair:
The members of the Working Group will elect a Chair and another as the Deputy Chair of the Working Group. The Chairperson shall ensure that the Working Group operates in accordance with the Terms of Reference at all times. Assistance will be provided to the Chair and Deputy Chair by the Manager Community Development and the Place & Community Team.

4 MEETINGS

4.1 Working Groups will meet on an ad hoc basis as required to progress with the Spring Season of events. Meetings may be called by the Chair in consultation with the relevant Director or Chief Executive Officer.

4.2 As there are no powers or duty delegated to the Working Group the meetings are not open to the public.

4.3 Notice of meetings including an agenda shall be given to members at least 5 days prior to each meeting.

4.4 The Director shall ensure that detailed meeting notes of all meetings are kept and shall, not later than twenty one (21) days after each meeting, provide the members with a copy of such meeting notes.

4.5 All members of the Working Group shall have one vote. If the vote of the members present are equally divided, the Chairperson is to cast a second vote.

4.6 Working Group members may list matters for consideration by tabling matters at least ten (10) days prior to the next meeting with the relevant Director. The Director will be responsible for preparing the Working Group Agenda, researching and reporting on those matters tabled for discussion. It is at the discretion of the Director or the Chief Executive Officer as to whether a matter will be included in the Agenda.

4.7 Meeting notes will form a record for the Shire of Dardanup, but will not require endorsement by Council. Matters requiring Council consideration will be subject to a separate specific report to be prepared by the appropriate Officer and taken to the next Council meeting. The meeting notes will be presented to Council through the Information Bulletin.

5 QUORUM

5.1 As there is no delegation, there will be no quorum for the working group.

6 DELEGATIONS

6.1 The Working Group performs an advisory function and does not have any delegated authority.

7 CONFLICTS OF INTEREST

7.1 All members need to be aware that any conflict of interest needs to be disclosed in writing, to ensure probity is maintained at all times. All previous disclosures of interest will remain listed in the Agenda and will be acknowledged at the start of a meeting, thereby negating to disclose it in writing again.

7.2 If a Member discloses a financial or proximity interest in a matter under consideration by the Group, the member should disclose the nature of their interest, and also the extent of that interest.

7.3 If a Member discloses a financial or proximity interest in a matter under consideration by the Group and wishes to remain and participate in the meeting, the Member is to inform the Chairperson that the Member intends to remain and participate in the meeting.

7.4 The meeting notes shall record the members' disclosure of interests and the extent of the interests. They shall also record the times a Disclosing Member has departed and/or re-entered the meeting and/or is absent from the meeting during the item of interest, or whether they remained and participated in the meeting when considering the matter to which an interest was declared.

7.5 If a member is unsure whether they have an interest in a matter, they are encouraged to raise the issue with the relevant Director in attendance at the meeting.

8 CONFIDENTIALITY AND PRIVACY

8.1 Members of the Working Group may have exposure to confidential or personal information and if so they are required to maintain the security of any confidential information and not access, use or remove any information, unless the member is authorised to do so.

8.2 At the first meeting of the Working Group, a Confidential Agreement will be provided to members for their review and execution.

8.3 Members of the Working Group will be advised when matters are deemed Confidential by the Chair. Documents provided at the meeting will be identified as Confidential and all confidential documents will be returned to the Chair following the meeting.

8.4 Should a member become aware of any unauthorised release or misuse of confidential or personal information, they are advised to contact the relevant Director.

8.5 Should a breach of Confidentially be made by an Working Group member, the Chief Executive Officer will remove the respective member from the Working Group.

8.6 Members are not to speak to the media in their capacity as Working Group Members and any comments on social media are to be in their personal capacity and not in their capacity as a Working Group Member.

9 CODE OF CONDUCT

9.1 The relevant Shire of Dardanup Code of Conduct applies to members of the Working Group and shall be adhered to during meetings and interactions with other Working Group members.

(Appendix ORD: 12.2.1C)

Shire of Dardanup

SUMMER EVENTS WORKING GROUP
2025/2026

INSTRUMENT OF APPOINTMENT
&
TERMS OF REFERENCE
2025/2026

(Appendix ORD: 12.2.1C)

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1 AIMS

The Working Group will take a seasonal approach to enhancing event visibility, encouraging collaboration, and strengthening community engagement. This will apply to events delivered by both the Shire of Dardanup and external organisers, promoting a more connected and coordinated calendar of activities across the region.

2 OBJECTIVES

2.1 The Objectives of the Summer Events Working Group is to:
Act in an advisory capacity on matters relating to events taking place within the Shire of Dardanup during Summer 2026. This includes events delivered by both the Shire and external organisers.

3 MEMBERSHIP

3.1 The term of appointment for membership will be a period of Summer 2026 (3 months: December, January and February).

3.2 Community Representation:
Membership will be sought from the Shire of Dardanup Community. A maximum of eight (8) community representatives will be appointed from across the Shire.
Membership will be sought from the following Organisations:

- Eaton Lions Club
- Dardanup Lions Club
- Dardanup & Districts Residents Association
- Burekup & Districts Country Club
- Other Groups may be added

3.3 Youth Advisory Group (YAG) Representation:
Membership will be sought from the Shire of Dardanup Youth Advisory Group. A maximum of two (2) YAG members will be appointed to join the Summer Events Working Group.

3.4 Shire Officers:
The Chief Executive Officer shall appoint an officer to liaise and manage the Working Group. It has been identified that this role will fall to Manager Community Development. Shire staff attending the Working Group will table papers for discussion and participate in the discussion. Shire Officers are not members of the Working Group and shall not vote.

3.5 Chair and Deputy Chair:
The members of the Working Group will elect a Chair and another as the Deputy Chair of the Working Group. The Chairperson shall ensure that the Working Group operates in accordance with the Terms of Reference at all times. Assistance will be provided to the Chair and Deputy Chair by the Manager Community Development and the Place & Community Team.

4 MEETINGS

4.1 Working Groups will meet on an ad hoc basis as required to progress with the Summer Season of events. Meetings may be called by the Chair in consultation with the relevant Director or Chief Executive Officer.

4.2 As there are no powers or duty delegated to the Working Group the meetings are not open to the public.

4.3 Notice of meetings including an agenda shall be given to members at least 5 days prior to each meeting.

4.4 The Director shall ensure that detailed meeting notes of all meetings are kept and shall, not later than twenty one (21) days after each meeting, provide the members with a copy of such meeting notes.

4.5 All members of the Working Group shall have one vote. If the vote of the members present are equally divided, the Chairperson is to cast a second vote.

4.6 Working Group members may list matters for consideration by tabling matters at least ten (10) days prior to the next meeting with the relevant Director. The Director will be responsible for preparing the Working Group Agenda, researching and reporting on those matters tabled for discussion. It is at the discretion of the Director or the Chief Executive Officer as to whether a matter will be included in the Agenda.

4.7 Meeting notes will form a record for the Shire of Dardanup, but will not require endorsement by Council. Matters requiring Council consideration will be subject to a separate specific report to be prepared by the appropriate Officer and taken to the next Council meeting. The meeting notes will be presented to Council through the Information Bulletin.

5 QUORUM

5.1 As there is no delegation, there will be no quorum for the working group.

6 DELEGATIONS

6.1 The Working Group performs an advisory function and does not have any delegated authority.

7 CONFLICTS OF INTEREST

7.1 All members need to be aware that any conflict of interest needs to be disclosed in writing, to ensure probity is maintained at all times. All previous disclosures of interest will remain listed in the Agenda and will be acknowledged at the start of a meeting, thereby negating to disclose it in writing again.

7.2 If a Member discloses a financial or proximity interest in a matter under consideration by the Group, the member should disclose the nature of their interest, and also the extent of that interest.

7.3 If a Member discloses a financial or proximity interest in a matter under consideration by the Group and wishes to remain and participate in the meeting, the Member is to inform the Chairperson that the Member intends to remain and participate in the meeting.

7.4 The meeting notes shall record the members' disclosure of interests and the extent of the interests. They shall also record the times a Disclosing Member has departed and/or re-entered the meeting and/or is absent from the meeting during the item of interest, or whether they remained and participated in the meeting when considering the matter to which an interest was declared.

7.5 If a member is unsure whether they have an interest in a matter, they are encouraged to raise the issue with the relevant Director in attendance at the meeting.

8 CONFIDENTIALITY AND PRIVACY

8.1 Members of the Working Group may have exposure to confidential or personal information and if so they are required to maintain the security of any confidential information and not access, use or remove any information, unless the member is authorised to do so.

8.2 At the first meeting of the Working Group, a Confidential Agreement will be provided to members for their review and execution.

8.3 Members of the Working Group will be advised when matters are deemed Confidential by the Chair. Documents provided at the meeting will be identified as Confidential and all confidential documents will be returned to the Chair following the meeting.

8.4 Should a member become aware of any unauthorised release or misuse of confidential or personal information, they are advised to contact the relevant Director.

8.5 Should a breach of Confidentially be made by an Working Group member, the Chief Executive Officer will remove the respective member from the Working Group.

8.6 Members are not to speak to the media in their capacity as Working Group Members and any comments on social media are to be in their personal capacity and not in their capacity as a Working Group Member.

9 CODE OF CONDUCT

9.1 The relevant Shire of Dardanup Code of Conduct applies to members of the Working Group and shall be adhered to during meetings and interactions with other Working Group members.

Shire of Dardanup

AUTUMN EVENTS WORKING GROUP
2025/2026

INSTRUMENT OF APPOINTMENT
&
TERMS OF REFERENCE
2025

(Appendix ORD: 12.2.1D)

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1 AIMS

The Working Group will take a seasonal approach to enhancing event visibility, encouraging collaboration, and strengthening community engagement. This will apply to events delivered by both the Shire of Dardanup and external organisers, promoting a more connected and coordinated calendar of activities across the region.

2 OBJECTIVES

2.1 The Objectives of the Autumn Events Working Group is to:
Act in an advisory capacity on matters relating to events taking place within the Shire of Dardanup during Autumn 2026. This includes events delivered by both the Shire and external organisers.

3 MEMBERSHIP

3.1 The term of appointment for membership will be a period of Autumn 2026 (3 months: March, April and May).

3.2 Community Representation:
Membership will be sought from the Shire of Dardanup Community. A maximum of eight (8) community representatives will be appointed from across the Shire.
Membership will be sought from the following Organisations:

- Eaton Foreshore Festival Committee
- Ferguson Valley Marketing
- Dardanup Art Spectacular Committee
- Dardanup & Districts Residents Association
- Other Groups may be added

3.3 Youth Advisory Group (YAG) Representation:
Membership will be sought from the Shire of Dardanup Youth Advisory Group. A maximum of two (2) YAG members will be appointed to join the Autumn Events Working Group.

3.4 Shire Officers:
The Chief Executive Officer shall appoint an officer to liaise and manage the Working Group. It has been identified that this role will fall to Manager Community Development. Shire staff attending the Working Group will table papers for discussion and participate in the discussion. Shire Officers are not members of the Working Group and shall not vote.

3.5 Chair and Deputy Chair:
The members of the Working Group will elect a Chair and another as the Deputy Chair of the Working Group. The Chairperson shall ensure that the Working Group operates in accordance with the Terms of Reference at all times. Assistance will be provided to the Chair and Deputy Chair by the Manager Community Development and the Place & Community Team.

4 MEETINGS

4.1 Working Groups will meet on an ad hoc basis as required to progress with the Autumn Season of events. Meetings may be called by the Chair in consultation with the relevant Director or Chief Executive Officer.

4.2 As there are no powers or duty delegated to the Working Group the meetings are not open to the public.

4.3 Notice of meetings including an agenda shall be given to members at least 5 days prior to each meeting.

4.4 The Director shall ensure that detailed meeting notes of all meetings are kept and shall, not later than twenty one (21) days after each meeting, provide the members with a copy of such meeting notes.

4.5 All members of the Working Group shall have one vote. If the vote of the members present are equally divided, the Chairperson is to cast a second vote.

4.6 Working Group members may list matters for consideration by tabling matters at least ten (10) days prior to the next meeting with the relevant Director. The Director will be responsible for preparing the Working Group Agenda, researching and reporting on those matters tabled for discussion. It is at the discretion of the Director or the Chief Executive Officer as to whether a matter will be included in the Agenda.

4.7 Meeting notes will form a record for the Shire of Dardanup, but will not require endorsement by Council. Matters requiring Council consideration will be subject to a separate specific report to be prepared by the appropriate Officer and taken to the next Council meeting. The meeting notes will be presented to Council through the Information Bulletin.

5 QUORUM

5.1 As there is no delegation, there will be no quorum for the working group.

6 DELEGATIONS

6.1 The Working Group performs an advisory function and does not have any delegated authority.

7 CONFLICTS OF INTEREST

7.1 All members need to be aware that any conflict of interest needs to be disclosed in writing, to ensure probity is maintained at all times. All previous disclosures of interest will remain listed in the Agenda and will be acknowledged at the start of a meeting, thereby negating to disclose it in writing again.

7.2 If a Member discloses a financial or proximity interest in a matter under consideration by the Group, the member should disclose the nature of their interest, and also the extent of that interest.

7.3 If a Member discloses a financial or proximity interest in a matter under consideration by the Group and wishes to remain and participate in the meeting, the Member is to inform the Chairperson that the Member intends to remain and participate in the meeting.

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7.5 If a member is unsure whether they have an interest in a matter, they are encouraged to raise the issue with the relevant Director in attendance at the meeting.

8 CONFIDENTIALITY AND PRIVACY

8.1 Members of the Working Group may have exposure to confidential or personal information and if so they are required to maintain the security of any confidential information and not access, use or remove any information, unless the member is authorised to do so.

8.2 At the first meeting of the Working Group, a Confidential Agreement will be provided to members for their review and execution.

8.3 Members of the Working Group will be advised when matters are deemed Confidential by the Chair. Documents provided at the meeting will be identified as Confidential and all confidential documents will be returned to the Chair following the meeting.

8.4 Should a member become aware of any unauthorised release or misuse of confidential or personal information, they are advised to contact the relevant Director.

8.5 Should a breach of Confidentially be made by an Working Group member, the Chief Executive Officer will remove the respective member from the Working Group.

8.6 Members are not to speak to the media in their capacity as Working Group Members and any comments on social media are to be in their personal capacity and not in their capacity as a Working Group Member.

9 CODE OF CONDUCT

9.1 The relevant Shire of Dardanup Code of Conduct applies to members of the Working Group and shall be adhered to during meetings and interactions with other Working Group members.

YOUTH ADVISORY GROUP

INSTRUMENT OF APPOINTMENT
&
TERMS OF REFERENCE

2025/2026

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1 AIMS

The Youth Advisory Group aims to provide advice on developing and implementing youth-related programs, events and activities that achieves the outcomes of the Council Plan 2022-2032. Along with empowering and supporting young people to develop leadership and advocacy skills that assist youth to be actively involved in their communities.

2 OBJECTIVES

The Objectives of the Youth Advisory Group (YAG) are to:

2.1 Act in an advisory capacity on matters relating to youth, with a specific focus on:

- Youth Events and Festivals;
- Community Events delivered by the Shire of Dardanup and external event organisers (specific representation on the Spring, Summer and Autumn Event Working Groups)
- Youth Programs;
- Youth Art projects;
  - Performing Art
  - Public Art
  - Events
- Youth Engagement and Inclusion
- Youth Connection
- Youth Health and Wellbeing
- Planning for Youth in the Community (example; public open spaces, place plans etc)

2.2 Provide advice and make recommendations relating to:

2.2.1 The formulation of a community and Council vision with regards to youth development and empowerment, along with youth events and activities; and

2.2.2 The development and implementation of relevant youth initiatives, programs and events.

2.3 Empower youth to develop leadership and advocacy skills that assist them to be actively involved in their communities.

3 MEMBERSHIP

3.1 *Youth Representation*:
Membership will be sought from young people aged 12-25 who reside within the Shire of Dardanup.
There will be no maximum number of youth representatives on the group.

3.4 Elected Members:
No elected members will be part of the youth advisory group.

3.5 Shire Officers:

The Chief Executive Officer shall appoint an officer to manage the Advisory Group. In normal circumstances, this is the Place and Community Officer who holds the youth portfolio. Shire Officers are not members of the Advisory Group and shall not vote.

3.6 *Chair:*
The position of the Chair will be shared on a rotational basis amongst the young people on the YAG.

3.7 *Advisory Group Support*:
The relevant Director will arrange for administrative support. Such support will include the preparation and distribution of the agenda, notice of meetings, and recording and distribution of meeting notes. The Advisory Group secretariat is also responsible for arranging the meeting venue, refreshments and coordinating any presentations.

3.8 Specialist Advice:
Individuals and groups may be invited to attend Advisory Group meetings to provide specialist advice. They must not be involved in the decision-making process and cannot vote on any issue.

4 MEETINGS

4.1 Youth Advisory Group will meet monthly rotating meeting locations between Eaton, Dardanup and Burekup. Extraordinary meetings may be called by the Place and Community Officer or Manager Community Development.

4.2 As there are no powers or duty delegated to the Advisory Group the meetings are not open to the public.

4.3 Notice of meetings including an agenda shall be given to members at least 5 days prior to each meeting.

4.4 The Place and Community Officer shall ensure that detailed meeting notes of all meetings are kept and shall, not later than 5 days after each meeting, provide the members with a copy of such meeting notes.

4.5 All members of the Advisory Group shall have one vote. If the vote of the members present is equally divided, a coin will be flipped.

4.6 Advisory Group members may list matters for consideration by tabling matters at least ten (10) days prior to the next meeting with the relevant Place and Community Officer. The Place and Community will be responsible for preparing the Advisory Group Agenda, researching and reporting on those matters tabled for discussion. It is at the discretion of the Place and Community Engagement Manager as to whether a matter will be included in the Agenda.

4.7 Meeting notes will form a record for the Shire of Dardanup, but will not require endorsement by Council. Matters requiring Council consideration will be subject to a separate specific report to be prepared by the appropriate Officer and taken to the next Council meeting. The meeting notes will be presented to Council through the Information Bulletin.

5 QUORUM

5.1 There will be no quorum as no decisions will be made by the YAG; only recommendations to the Shire.

6 DELEGATIONS

6.1 The Advisory Group performs an advisory function and does not have any delegated authority.

7 CONFLICTS OF INTEREST

7.1 All members need to be aware that any conflict of interest needs to be disclosed in writing, to ensure probity is maintained at all times. All previous disclosures of interest will remain listed in the Agenda and will be acknowledged at the start of a meeting, thereby negating to disclose it in writing again.

7.2 If a Member discloses a financial or proximity interest in a matter under consideration by the Group, the member should disclose the nature of their interest, and also the extent of that interest.

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7.5 If a member is unsure whether they have an interest in a matter, they are encouraged to raise the issue with the relevant Director in attendance at the meeting.

8 CONFIDENTIALITY AND PRIVACY

8.1 Members of the Advisory Group may have exposure to confidential or personal information and if so they are required to maintain the security of any confidential information and not access, use or remove any information, unless the member is authorised to do so.

8.2 At the first meeting of the Advisory Group, a Confidential Agreement will be provided to members for their review and execution.

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8.6 Members are not to speak to the media in their capacity as Advisory Group Members and any comments on social media are to be in their personal capacity and not in their capacity as an Advisory Group Member.

9 CODE OF CONDUCT

9.1 The relevant Shire of Dardanup Code of Conduct applies to members of the Advisory Group and shall be adhered to during meetings and interactions with Elected Members, staff and the community when acting in the capacity of an Advisory Group member.

(Appendix ORD: 12.2.2A)

Shire of Dardanup

Administration Centre Eaton
P.O. Box 7016 - 1 Council Drive
EATON WA 6232
Tel: 9724 0000 Fax: 9724 0091
www.dardanup.wa.gov.au
ABN: 57 305 829 653

Records No. 12-90736
File No. PL113177

Our Ref: AMDA177/10
Your Ref:
Enquiries: 9724 0087
elizabethe@dardanup.wa.gov.au

31 July 2012

The Secretary
Western Australian Planning Commission
6th Floor Bunbury Tower
61 Victoria Street
BUNBURY WA 6230

Dear Sir/Madam

TOWN PLANNING SCHEME NO. 3, AMENDMENT NO. A177/10

Further to your letter dated 12 October 2011, requesting modifications to the above Amendment, I wish to advise that in accordance with Section 83 of the Planning and Development Act 2005 (as amended), the Amendment and the relevant Development Contribution Plan Report was re-advertised for public comment.

No submissions were received and in accordance with Section 87(1) of the Planning and Development Act 2005 (as amended), Council resolved, at its meeting of 26 July 2012, to adopt the Amendment with the requested modifications and request the Hon. Minister for Planning and Infrastructure grant final approval.

Three (3) copies of the signed and sealed Amendment documents are enclosed along with three (3) copies of the DCP Report.

If you have any queries concerning the above, please contact me on 9724 0087.

Yours faithfully

ELIZABETH EDWARDS
Principal Planning Officer

Enc: Council Minutes
Scheme Amendment Documents x 3
Development Contribution Plan Report x 3

SHIRE OF DARDANUP

Town Planning Scheme No. 3

Amendment No. 177
Special Control Area

Prepared by:
Shire of Dardanup
1 Council Drive
Eaton 6232

Ph: 9724 0000
Fx: 9724 0091

Revised April 2012

PLANNING AND DEVELOPMENT ACT, 2005

RESOLUTION DECIDING TO AMEND A TOWN PLANNING SCHEME

SHIRE OF DARDANUP
TOWN PLANNING SCHEME NO. 3

AMENDMENT NO. 177

RESOLVED that the local government, in pursuance of Section 75 of the Planning and Development Act, 2005 amend the above Town Planning Scheme by:

1. Inserting a new 'Part IX – Special Control Areas'.
2. Inserting a new 'Appendix XI – Development Contribution Areas'.
3. Including the Dardanup and Burekup Expansion Strategy Areas as Development Contribution Areas.

Dated.....27.....day of.....July.....2012

.....
CHIEF EXECUTIVE OFFICER

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1.0 Background

State Planning Policy No. 3.6 (SPP 3.6) Development Contributions for Infrastructure was gazetted in November 2009. SPP 3.6 provides Model Scheme Text provisions for the creation of Development Contribution Plans in order for contributions for common infrastructure and community costs to be collected from developers.

The Shire has a need to have the ability to coordinate the equitable and timely provision of common infrastructure and community facilities for its expanding townsites and upcoming industrial developments. Therefore, this Amendment proposes to introduce the Model Scheme Text for Developer Contributions into the Shire of Dardanup Town Planning Scheme No. 3 (TPS No. 3).

2.0 Planning Framework

2.1 Planning and Development Act 2005

Section 75 of the Planning and Development Act 2005 gives a Local Government the power to amend a Local Planning Scheme. Section 81 requires an amendment to a Local Planning Scheme to be referred to the EPA for consideration and Section 83 requires the amendment to be advertised.

2.2 Town Planning Regulations 1967

Sections 15 to 18 set out the procedures to be followed by the Local Government when preparing and processing a Scheme Amendment. Appendix B of the Regulations provides the Model Scheme Text.

2.3 State Planning Policy 3.6 – Developer Contributions

This SPP sets out the principles and considerations that apply to development contributions for the provision of infrastructure in new and established urban areas. The objectives of the Policy are:

- *to promote the efficient and effective provision of public infrastructure and facilities to meet the demands arising from new growth and development;*

- *to ensure that development contributions are necessary and relevant to the development to be permitted and are charged equitably among those benefiting from the infrastructure and facilities to be provided;*

- *to ensure consistency and transparency in the system for apportioning, collecting and spending development contributions;*

- *to ensure the social well-being of communities arising from, or affected by, development.*

The SPP sets out principles underlying development contributions which must be levied in accordance with the following principles:

- *The need and the nexus for the infrastructure;*

- *Transparency of the method for calculating the contribution and the manner in which it is applied;*

- *Contributions being equitable;*

- *Provides certainty for landowners and developers;*

- *Efficiency of contributions on a whole of life capital cost basis;*

- *Consistency across development contribution area;*

- *Provides a right of consultation and arbitration for landowners and developers;*

- *Provides accountability in the manner in which contributions are determined and expended.*

2.4 Shire of Dardanup Town Planning Scheme No. 3

The relevant objectives of the Scheme as contained in Clause 1.3 are:-

- *to secure the amenity, health and convenience of the Scheme Area and the inhabitants thereof; and*

- *to make provision for other matters necessary or incidental to town planning and housing.*

3.0 Proposal Details

3.1 Scheme Text Changes

This Amendment proposes to insert the model scheme text provided in SPP 3.6 as Part XI – Special Control Area. The new Scheme text is also proposed to be included in the Scheme under Amendment No. 174 but has been included in the Amendment in the event this Amendment is finalised before Amendment No. 174.

3.2 Scheme Map Changes

The Amendment also proposes to include the 'Special Control Area' and 'Development Contribution Area' on the Scheme map legend and include the Dardanup Townsite Expansion Strategy Area as DCA2 and the Burekup Townsite Expansion Strategy Area as DCA3. DCA1 is proposed to be included in the Scheme under a separate amendment that proposes to rezone Lot 105 Columbas Drive, Picton East to Development Zone (Amendment No. 174).

The Dardanup Townsite Expansion Strategy Area (DCA2) will require cost contributions towards the provision of improved community facilities to cater for the increased population. Similarly, the Burekup Townsite Expansion Strategy Area (DCA3) will also require cost contributions towards the provision of improved community facilities for the increase in population. Shire officers are currently in the process of preparing these cost contribution plans.

3.3 Development Contribution Plans

Shire officers have completed the Development Contribution Plan (DCP) for DCA2 (Dardanup Townsite Expansion Strategy Area). This amendment proposes to insert this DCP as Appendix XII. A Development Contribution Plan Report has also been prepared for DCA2 which provides the details and justification for the DCP and also includes the Cost Apportionment Schedule.

Shire officers have not yet commenced the preparation of a Development Contribution Plan for DCA3 (Burekup Townsite Expansion Strategy Area).

4.0 Conclusion

Amendment No. 177 proposes to amend the Shire of Dardanup TPS No. 3 to insert the model scheme text contained within SPP 3.6 – Development Contributions for Infrastructure, including associated appendices.

Amendment No. 177 also proposes to include the Dardanup and Burekup Townsite Expansion Areas in the Scheme text and map as Development Contribution Areas.

After considering the proposed changes and reasons for these changes, the Shire respectfully requests that the Minister for Planning approve Amendment No. 177 to the Shire of Dardanup TPS No. 3.

PLANNING AND DEVELOPMENT ACT 2005

SHIRE OF DARDANUP
TOWN PLANNING SCHEME NO. 3

AMENDMENT NO. 177

The Shire of Dardanup under and by virtue of the powers conferred upon it in that behalf by the Planning and Development Act, 2005 (as amended) hereby amends the above Town Planning Scheme by:

1. Inserting a new 'Part IX – Special Control Areas' into the Scheme text as follows:

PART IX – SPECIAL CONTROL AREAS

9.1 Operation of special control areas

9.1.1 The following special control areas are shown on the scheme map—

(a) Development contribution areas shown on the scheme map as DCA with a number and included in Appendix XI.

9.1.2 In respect of a special control area shown on a scheme map, the provisions applying to the special control area apply in addition to the provisions applying to any underlying zone or reserve and any general provisions of the scheme.

9.2 Development contribution areas

9.2.1 Interpretation

In clause 9.2, unless the context otherwise requires—

'Administrative costs' means such costs as are reasonably incurred for the preparation and (with respect to standard infrastructure items) implementation of the development contribution plan.

'Administrative items' means the administrative matters required to be carried out by or on behalf of the local government in order to prepare and (with respect to standard infrastructure items) implement the development contribution plan, including legal, accounting, planning engineering, and other professional advice.

'Cost apportionment schedule' means a schedule prepared and distributed in accordance with clause 9.2.10.

'Cost contribution' means the contribution to the cost of infrastructure and administrative costs.

'Development contribution area' means shown on the scheme map as DCA with a number and included in Appendix XI.

'Development contribution plan' means a development contribution plan prepared in accordance with the provisions of State Planning Policy 3.6 Development Contributions for Infrastructure and the provisions of this clause 9 of the Scheme.

'Development contribution plan report' means a report prepared and distributed in accordance with clause 9.2.10.

'Infrastructure' means the standard infrastructure items and community infrastructure, including recreational facilities; community centres; child care and after school centres; libraries and cultural facilities and such other services and facilities for which development contributions may reasonably be requested having regard to the objectives, scope and provisions of State Planning Policy 3.6 Development Contributions.

'Infrastructure costs' means such costs as are reasonably incurred for the acquisition and construction of infrastructure.

'Local government' means the local government or local governments in which the development contribution area is located or through which the services and facilities are provided.

'Owner' means an owner of land that is located within a development contribution area.

9.2.2 Purpose

The purpose of having development contribution areas is to—

(a) provide for the equitable sharing of the costs of infrastructure and administrative costs between owners;

(b) ensure that cost contributions are reasonably required as a result of the subdivision and development of land in the development contribution area; and

(c) coordinate the timely provision of Infrastructure.

9.2.3 Development contribution plan required

9.2.3.1 A development contribution plan is required to be prepared and adopted for each development contribution area.

9.2.3.2 The local government shall, within 28 days of adopting a development contribution plan, forward a copy of the adopted development contribution plan to the Commission.

9.2.4 Development contribution plan part of Scheme

The development contribution plan is incorporated in Appendix XII as part of this Scheme.

9.2.5 Subdivision, strata subdivision and development

9.2.5.1 The local government shall not withhold its support for subdivision, strata subdivision or refuse to approve a development solely for the reason that a development contribution plan is not in effect, there is no approval to advertise a development contribution plan, or that there is no other arrangement with respect to an owner's and/or subdivider's contribution towards the provision of community infrastructure.

9.2.5.2 The Commission may impose a condition requiring the preparation and implementation of a development contribution plan on subdivision approvals which relate to land included in a development contribution area.

9.2.5.3 The local government shall impose a condition for development requiring the owner to make a cost contribution payment in accordance with the cost apportionment schedule prepared as part of the development contribution plan required under clause 9.2.

9.2.6 Guiding principles for development contribution plans

The development contribution plan for any development contribution area is to be prepared in accordance with the following principles—

a) Need and the nexus
The need for the infrastructure included in the plan must be clearly demonstrated (need) and the connection between the development and the demand created should be clearly established (nexus).

b) Transparency
Both the method for calculating the development contribution and the manner in which it is applied should be clear, transparent and simple to understand and administer.

c) Equity
Development contributions should be levied from all developments within a development contribution area, based on their relative contribution to need.

d) Certainty
All development contributions should be clearly identified and methods of accounting for cost adjustments determined at the commencement of a development.

e) Efficiency
Development contributions should be justified on a whole of life capital cost basis consistent with maintaining financial discipline on service providers by precluding over recovery of costs.

f) Consistency
Development contributions should be applied uniformly across a development contribution area and the methodology for applying contributions should be consistent.

g) Right of consultation and review
Owners and/or subdividers have the right to be consulted on the manner in which development contributions are determined. They also have the opportunity to seek a review by an independent third party if they believe the calculation of the costs of the contributions is not reasonable.

h) Accountable
There must be accountability in the manner in which development contributions are determined and expended.

9.2.7 Content of development contribution plans

9.2.7.1 The development contribution plan is to specify—

(a) the development contribution area to which the development contribution plan applies;

(b) the infrastructure and administrative items to be funded through the development contribution plan;

(c) the method of determining the cost contribution of each owner and or subdivider; and

(d) the priority and indicative timing for the provision of infrastructure.

9.2.7.2 A development contribution plan may take the form of a voluntary agreement between the local government and owner and/or subdivider in a development contribution area.

9.2.8 Period of development contribution plan

A development contribution plan shall specify the period during which it is to operate.

9.2.9 Land excluded

In calculating both the area of an owner's and/or subdivider's land and the total area of land in a development contribution area, the area of land provided in that development contribution area for—

(a) roads designated under the Greater Bunbury Region Scheme as primary regional roads and other regional roads;

(b) existing public open space;

(c) existing government primary and secondary schools; and

(d) such other land as is set out as excluded in the development contribution plan, is to be excluded.

9.2.10 Development contribution plan report and cost apportionment schedule

9.2.10.1 Within 90 days of the development contribution plan coming into effect, the local government is to adopt and make available a development contribution plan report and cost apportionment schedule to all owners and/or subdividers in the development contribution area.

9.2.10.2 The development contribution plan report and the cost apportionment schedule shall set out in detail the calculation of the cost contribution for each owner and or subdivider in the development contribution area, based on the methodology provided in the development contribution plan, and shall take into account any proposed staging of the development.

9.2.10.3 The development contribution plan report and the cost apportionment schedule do not form part of the scheme, but once adopted by the local government they are subject to review as provided under clause 9.2.11.

9.2.11 Cost contributions based on estimates

9.2.11.1 The determination of Infrastructure costs and administrative costs is to be based on amounts expended, but when expenditure has not occurred, it is to be based on the best and latest estimated costs available to the local government and adjusted accordingly, if necessary.

9.2.11.2 Where a cost apportionment schedule contains estimated costs, such estimated costs are to be reviewed at least annually by the local government—

(a) in the case of land to be acquired, in accordance with clause 9.2.12; and

(b) in all other cases, in accordance with the best and latest information available to the local government, until the expenditure on the relevant item of infrastructure or administrative costs has occurred.

9.2.11.3 The local government may have such estimated costs independently certified by appropriate qualified persons and must provide such independent certification to an owner and or subdivider when requested to do so.

9.2.11.4 Where any cost contribution has been calculated on the basis of an estimated cost, the local government—

(a) is to adjust the cost contribution of any owner and or subdivider in accordance with the revised estimated costs; and

(b) may accept a cost contribution, based upon estimated costs, as a final cost contribution and enter into an agreement with the owner and or subdivider accordingly.

9.2.11.5 Where an owner's and/or subdivider's cost contribution is adjusted under clause 9.2.11.4, the local government, on receiving a request in writing from an owner and/or subdivider, is to provide the owner and/or subdivider with a copy of estimated costs and the calculation of adjustments.

9.2.11.6 If an owner and/or subdivider objects to the amount of a cost contribution, the owner and/or subdivider may give notice to the local government requesting a review of the amount of the cost contribution by an appropriate qualified person ('independent expert') agreed by the local government and the owner and/or subdivider at the owner's and/or subdivider's expense, within 28 days after being informed of the cost contribution.

9.2.11.7 If the independent expert does not change the cost contribution to a figure acceptable to the owner and/or subdivider, the cost contribution is to be determined—

(a) by any method agreed between the local government and the owner and/or subdivider; or

(b) if the local government and the owner and/or subdivider cannot agree on a method pursuant to (a) or on an independent expert, by arbitration in accordance with the Commercial Arbitration Act 1985, with the costs to be shared equally between the local government and owner and/or subdivider.

9.2.12 Valuation

9.2.12.1 Clause 9.2.12 applies in order to determine the value of land to be acquired for the purpose of providing Infrastructure.

9.2.12.2 In clause 9.2.12—

'Value' means the fair market value of land, at a specified date, which is defined as the capital sum that would be negotiated in an arms length transaction in an open and unrestricted market, assuming the highest and best use of the land with all its potential and limitations (other than the limitation arising from the transaction for which the land is being valued), wherein the parties act knowledgeably, prudently and without compulsion to buy or sell.

'Valuer' means a licensed valuer or the Valuer-General as determined by the local government.

9.2.12.3 If an owner and/or subdivider objects to a valuation made by the valuer, the owner and/or subdivider may give notice to the local government requesting a review of the amount of the value, at the owner's and/or subdivider's expense, within 28 days after being informed of the value.

9.2.12.4 If, following a review, the valuer's determination of the value of the land is still not a figure acceptable to the owner and/or subdivider, the value is to be determined—

(a) by any method agreed between the local government and the owner and/or subdivider; or

(b) if the local government and the owner and/or subdivider cannot agree, the owner and/or subdivider may apply to the State Administrative Tribunal for a review of the matter under part 14 of the Planning and Development Act 2005.

9.2.13 Liability for cost contributions

9.2.13.1 An owner and/or subdivider must make a cost contribution in accordance with the applicable development contribution plan and the provisions of clause 9.2.

9.2.13.2 The Commission shall impose a condition for subdivision requiring the owner and/or subdivider to make a cost contribution payment in accordance with the cost apportionment schedule prepared as part of the development contribution plan required under clause 9.2.

9.2.13.3 An owner and/or subdivider shall pay the owner's and/or subdivider's cost contribution payment to the local government on the earlier of—

(a) a proponent seeking clearance of conditions of subdivision from the local government;

(b) the Western Australian Planning Commission endorsing its approval on the deposited plan or survey strata plan of the subdivision of the owner's and/or subdivider's land within the development contribution area;

(c) the commencement of any development on the owner's and/or subdivider's land within the development contribution area;

(d) the approval of any strata plan by the local government or Western Australian Planning Commission on the owner's and/or subdivider's land within the development contribution area; or

(e) the approval of a change or extension of use by the local government on the owner's and/or subdivider's land within the development contribution area.

The liability to pay the cost contribution payment arises only once upon the earliest of the above listed events.

9.2.13.4 Notwithstanding clause 9.2.13.3, an owner's and/or subdivider's liability to pay the owner's and/or subdivider's cost contribution does not arise if the owner and/or subdivider commences development of the first single house or outbuildings associated with that first single house on an existing lot which has not been subdivided or strata subdivided since the coming into effect of the development contribution plan.

9.2.13.5 Where a development contribution plan expires in accordance with clause 9.2.8, an owner's and/or subdivider's liability to pay the owner's and/or subdivider's cost contribution under that

development contribution plan shall be deemed to continue in effect and be carried over into any subsequent development contribution plan which includes the owner's and/or subdivider's land, subject to such liability.

9.2.14 Payment of cost contribution

9.2.14.1 The owner and/or subdivider, with the agreement of the local government, is to pay the owner's and/or subdivider's cost contribution by—

(a) cheque or cash;

(b) transferring to the local government or a public authority land in satisfaction of the cost contribution;

(c) the provision of physical infrastructure;

(d) some other method acceptable to the local government; or

(e) any combination of these methods.

9.2.14.2 The owner and/or subdivider, with the agreement of the local government, may pay the owner's and/or subdivider's cost contribution in a lump sum, by instalments or in such other manner acceptable to the local government.

9.2.14.3 Payment by an owner and/or subdivider of the cost contribution, including a cost contribution based upon estimated costs in a manner acceptable to the local government, constitutes full and final discharge of the owner's and/or subdivider's liability for the portion of land subject to the contribution under the development contribution plan and the local government shall provide certification in writing to the owner and/or subdivider of such discharge if requested by the owner and/or subdivider.

9.2.15 Charge on land

9.2.15.1 The amount of any cost contribution for which an owner and/or subdivider is liable under clause 9.2.13, but has not paid, is a charge on the owner's and/or subdivider's land to which the cost contribution relates, and the local government may lodge a caveat, at the owner's and/or subdivider's expense, against the owner's and/or subdivider's certificate of title to that land.

9.2.15.2 The local government, at the owner's and/or subdivider's expense and subject to such other conditions as the local government thinks fit, can withdraw a caveat lodged under clause 9.2.15.1 to permit a dealing and may then re-lodge the caveat to prevent further dealings.

9.2.15.3 If the cost contribution is paid in full, the local government, if requested to do so by the owner and/or subdivider and at the expense of the owner and/or subdivider, is to withdraw any caveat lodged under clause 9.2.15.

9.2.16 Administration of funds

9.2.16.1 The local government is to establish and maintain a reserve account in accordance with the Local Government Act 1995 for each development contribution area into which cost contributions for that development contribution area will be credited and from which all payments for the infrastructure costs and administrative costs within that development contribution area will be paid. The purpose of such a reserve account or the use of money in such a reserve account is limited to the application of funds for that development contribution area.

9.2.16.2 Interest earned on cost contributions credited to a reserve account in accordance with clause 9.2.16.1 is to be applied in the development contribution area to which the reserve account relates.

9.2.17 Shortfall or excess in cost contributions

9.2.17.1 If there is a shortfall in the total of cost contributions when all cost contributions have been made or accounted for in a particular development contribution area, the local government may—

(a) make good the shortfall;

(b) enter into agreements with owners and/or subdividers to fund the shortfall; or

(c) raise loans or borrow from a financial institution,

but nothing in paragraph 9.2.17.1(a) restricts the right or power of the local government to impose a differential rate to a specified development contribution area in that regard.

9.2.17.2 If there is an excess in funds available to the development contribution area when all cost contributions have been made or accounted for in a particular development contribution area, the local government is to refund the excess funds to contributing owners and/or subdividers for that development contribution area. To the extent, if any, that it is not reasonably practicable to identify owners and/or subdividers and/or their entitled amount of refund, any excess in funds shall be applied, to the provision of additional facilities or improvements in that development contribution area.

9.2.18 Powers of the local government

The local government in implementing the development contribution plan has the power to—

(a) acquire any land or buildings within the scheme area under the provisions of the Planning and Development Act 2005; and

(b) deal with or dispose of any land which it has acquired under the provisions of the Planning and Development Act 2005 in accordance with the law and for such purpose may make such agreements with other owners and/or subdividers as it considers fit.

9.2.19 Arbitration

Subject to clauses 9.2.12.3 and 9.2.12.4, any dispute between an owner and/or subdivider and the local government in connection with the cost contribution required to be made by an owner and/or subdivider is to be resolved by arbitration in accordance with the Commercial Arbitration Act 1985.

2) Inserting a new 'Appendix XI – Development Contribution Areas' into the Scheme text as follows:

APPENDIX XI – DEVELOPMENT CONTRIBUTION AREAS

DEVELOPMENT CONTRIBUTION AREA (DCA) NO.	DCA NAME	LAND DESCRIPTION	DEVELOPMENT CONTRIBUTION PLAN (DCP)

3) Include 'Special Control Area' on the Scheme Map legend as shown on the Amendment map.

4) Include 'DCA – Development Contribution Area' under 'Special Control Area' on the Scheme Map legend as shown on the Amendment map.

5) Include land within the Dardanup Townsite Expansion Strategy Area as 'DCA2' and land within the Burekup Townsite Expansion Strategy Area as 'DCA3' and amend the Scheme text as follows:

APPENDIX XI – DEVELOPMENT CONTRIBUTION AREAS

DEVELOPMENT CONTRIBUTION AREA (DCA) NO.	DCA NAME	LAND DESCRIPTION	DEVELOPMENT CONTRIBUTION PLAN (DCP)
DCA2	Dardanup Townsite Expansion Area	Land identified within the Dardanup Townsite Expansion Strategy	Dardanup Townsite Expansion Area DCP
DCA3	Burekup Townsite Expansion Area	Land identified within the Burekup Townsite Expansion Strategy	Burekup Townsite Expansion Area DCP

6) Amending the Scheme Map by including the Dardanup Townsite Expansion Strategy Area and the Burekup Townsite Expansion Strategy Area in the 'Special Control Area' and 'Development Contribution Area' as shown on the Amendment map.

7) Inserting a new Appendix XII – Community Infrastructure Development Contribution Plans into the Scheme text as follows:

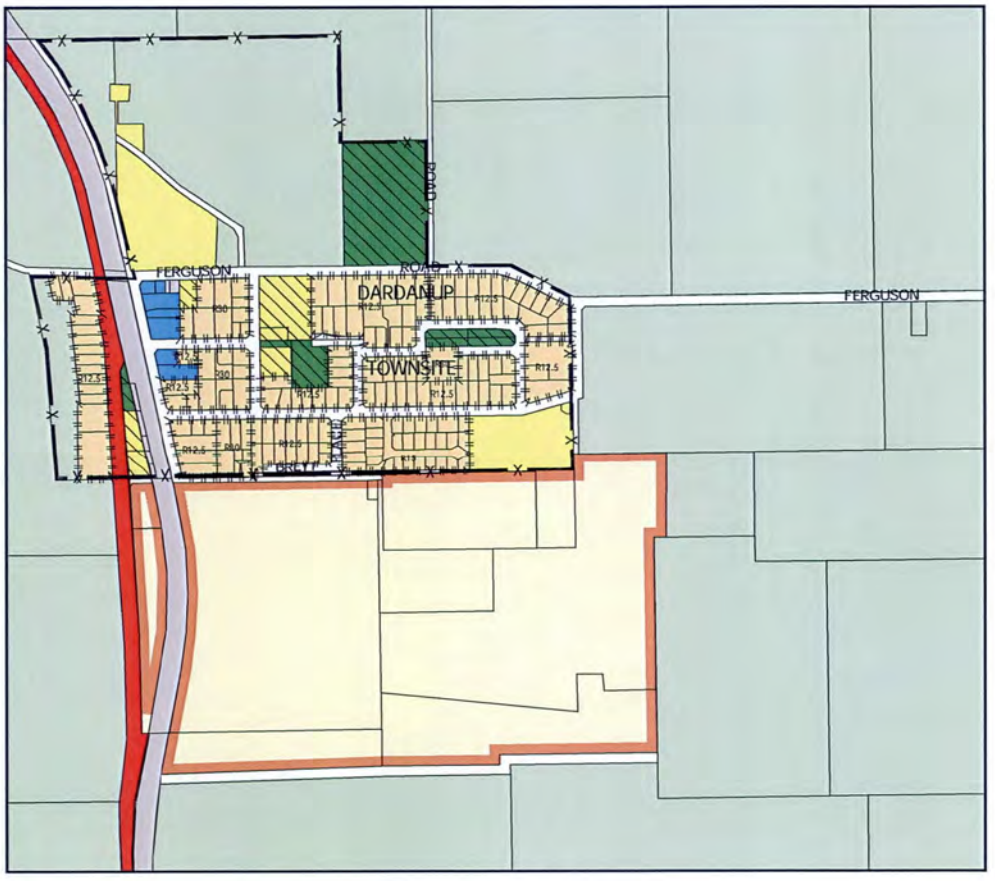
APPENDIX XII – COMMUNITY INFRASTRUCTURE DEVELOPMENT CONTRIBUTION PLANS

Reference No.	**DCP 2**
Area Name:	**DCA 2 – DARDANUP TOWNSITE EXPANSION AREA**
Relationship to other planning instruments:	The development contribution plan generally conforms to the *Strategic Plan, 10 year Strategic Financial Plan, Dardanup Revitalisation Project Concept Plan and Community Aspirations.*
Infrastructure and administrative items to be funded:	NEW INFRASTRUCTURE 1. Community Centre & Outdoor Play Area: • To be located at the existing Civic Centre on Little Street adjoining the Hall and Shire offices; • Single storey of approximately 170m² of standard finishes containing kitchen, toilets, main activity area, office space and infant health clinic; • Outdoor play area of approximately 140m² to include 1.8m high chain mesh surrounding fence, turf and reticulation; • Costs are inclusive of: o Planning and design; o Construction of facility; o External services within 3m of building; o Contingency to cover exclusions such as external services beyond 3m of building and unforeseen expenditure. UPGRADED INFRASTRUCTURE 2. Hard Courts at Dardanup Oval: • Upgrade lighting for all 5 courts; • Upgrade surface to 3 courts; • Remark surface to 3 courts; • Costs are inclusive of: o Planning and design; o Installation and undertaking of works; o External services within 3m of building; o Contingency to cover exclusions such as a requirement to upgrade switchboard for new lighting and unforeseen expenditure. 3. Dardanup Oval Club Rooms: • Extension of approximately 94m² (10.4m x 9m) of standard construction and basic finishes to include new change rooms and new public toilets; • Verandahs of approximately 54m² (9m x 3m x 2m) with concrete floor surface; • Costs are inclusive of: o Planning and design; o Construction of building; o External services within 3m of building; o Contingency to cover exclusions such as external services beyond 3m of building and unforeseen expenditure. 4. Dardanup Oval Car Park: • Upgrade surface and line-mark existing car parking area of approximately 20 bays; • Construct and line-mark existing informal grassed car parking area

	of approximately 70 bays; • Costs are inclusive of: o Planning and design; o Construction of car parking; o Stormwater drainage; o Minimal landscaping; o Contingency to cover exclusions such as additional sand fill for stormwater drainage purposes and unforeseen expenditure. 5. <u>Public Library:</u> • Extension of approximately 40m²; • Costs are inclusive of: o Planning and design; o Construction of extension; o External services within 3m of building; o Fit-out with bookshelf units; o Contingency to cover exclusions such as external services beyond 3m of building and unforeseen expenditure. 6. Administrative costs including – • Costs to prepare and administer the plan during the period of operation inclusive of: o Legal expenses; o Valuation fees; o Proportion of staff salaries; o Computer software or hardware to administer plan; • Costs to prepare and review estimates; • Costs to prepare and review cost apportionment schedule; • Valuation costs.
Method for calculating contributions:	The DCP identifies the needs of the community infrastructure to be upgraded to cater for the future additional population as a result of the *Dardanup Townsite Expansion Strategy*. This calculation excludes – • The demand for the infrastructure generated by the existing population; • Any upgrading or works required to the infrastructure as maintenance; • Ongoing maintenance of the infrastructure; and Infrastructure items 1 and 3 to 5 are apportioned 1/3 Council, 1/3 Developer and 1/3 external funding such as grants. Infrastructure item 2 will not qualify for external funding and therefore the costs are apportioned equally between the Council and the Developer. The Developer is also liable to pay 100% of the DCP administration costs at item 6. The Developer contribution will be calculated based on their proportion of the total net DCA: (cost contribution = developer apportioned cost x developer % of total net DCA).
Priority and timing:	1. Community Centre & Outdoor Play Area .....2017/2018 2. Hard Courts at Dardanup Oval .....2017/2018 3. Dardanup Oval Club Rooms.....2020/2021 4. Dardanup Oval Car Parking.....2020/2021 5. Public Library.....2020/2021
Period of operation:	10 years

Review process:	The plan will be reviewed when considered appropriate, having regard to the rate of subsequent development in the area since the last review and the degree of development potential still existing. The estimated infrastructure costs in this plan will be reviewed as least annually to reflect changes in funding and revenue sources and indexed based on the Building Cost Index (as provided by Rawlinsons Australian Contribution Handbook), direct quotation or as provided by a suitably qualified person.

8) Amend the Scheme Map and Text accordingly.



EXISTING ZONING

LEGEND

Dardanup Z 3

- GENERAL FARMING
- SCHOOL
- RECREATION
- RESIDENTIAL
- OTHER COMMUNITY
- PUBLIC UTILITIES
- BUSINESS-COMMERCIAL
- DEVELOPMENT
- NO ZONE
- PRIMARY REGIONAL ROADS
- RAILWAYS

- LPS Rcodes - Capture data
- LPS Town Bdy Land Act - Capture data
- LPS Cadastre - Capture data

Government of Western Australia
Department for Planning and Infrastructure

SHIRE OF DARDANUP

TOWN PLANNING SCHEME NO 3

AMENDMENT NO. 177

N

Scale 1:15000

0 250 m

SCHEME AMENDMENT MAP

LEGEND

DEVELOPMENT CONTRIBUTION AREA

SPECIAL CONTROL AREA

LPS Cadastre - Capture data

Government of Western Australia
Department for Planning and Infrastructure

SHIRE OF DARDANUP

TOWN PLANNING SCHEME NO 3

AMENDMENT NO. 177

N

Scale 1:15000

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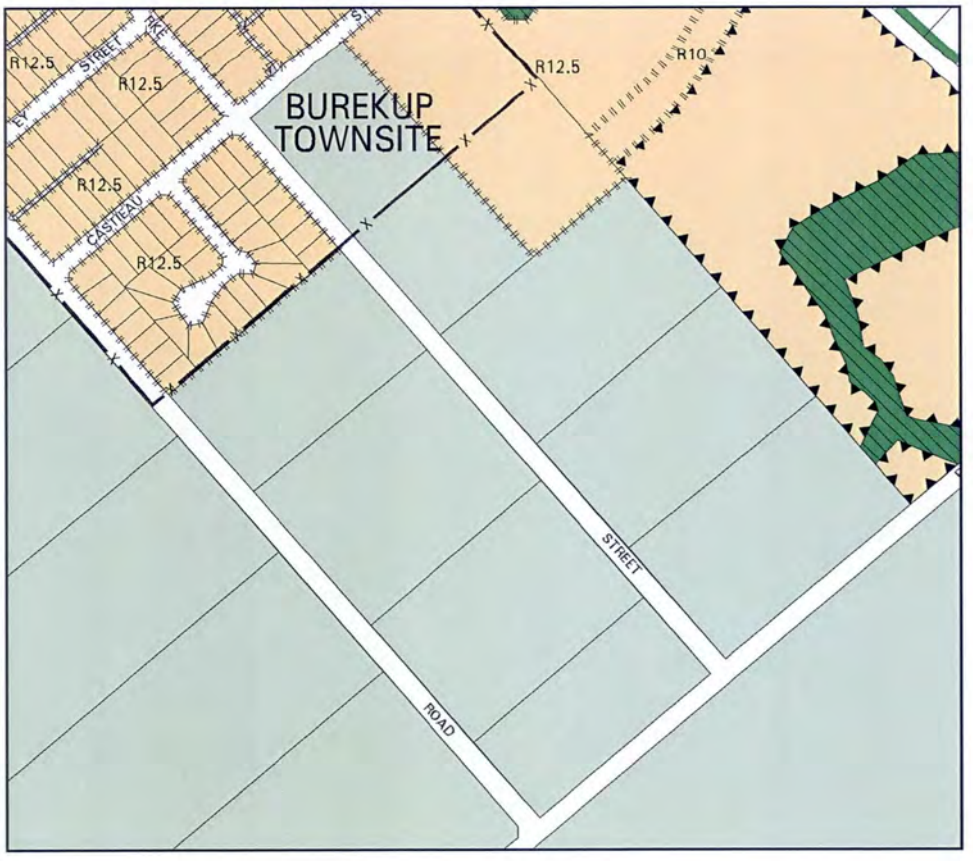

EXISTING ZONING

LEGEND

Dardanup Z 3

- RECREATION
- RESIDENTIAL
- SMALL HOLDING
- GENERAL FARMING
- PUBLIC UTILITIES
- LPS Rcodes - Capture data
- BUSHLAND DEVELOPMENT AREA
- LPS Town Bdy Land Act - Capture data
- LPS Cadastre - Capture data

Government of Western Australia
Department for Planning and Infrastructure

SHIRE OF DARDANUP

TOWN PLANNING SCHEME NO 3

AMENDMENT NO. 177

N

Scale 1:8000

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(Appendix ORD: 12.2.2A)

SCHEME AMENDMENT MAP

LEGEND

- LPS Cadastre - Capture data
- DEVELOPMENT CONTRIBUTION AREA
- SPECIAL CONTROL AREA

Government of Western Australia
Department for Planning and Infrastructure

SHIRE OF DARDANUP

TOWN PLANNING SCHEME NO 3

AMENDMENT NO. 177

N

Scale 1:8000

0 50 m

(Appendix ORD: 12.2.2A)

Adoption Regulation 13(1)

Adopted by Resolution of Council of the Shire of Dardanup at the meeting of the Council held on the 15 day of December 2010.

CHIEF EXECUTIVE OFFICER

John E Gardiner

PRESIDENT

Final Approval Regulation 21(2), Resolution 22(1) and 2

Adopted for Final Approval by the Shire of Dardanup at the meeting of Council held on the 26 day of July 2012 and the Seal of the Municipality was, pursuant to that Resolution, hereunto affixed in the presence of:

CHIEF EXECUTIVE OFFICER

John E Gardiner

PRESIDENT

Recommended/Submitted for Final Approval delegated under Section 16 of the Planning and Development Act 2005.

DELEGATED UNDER S.16 OF THE PLANNING AND DEVELOPMENT ACT 2005

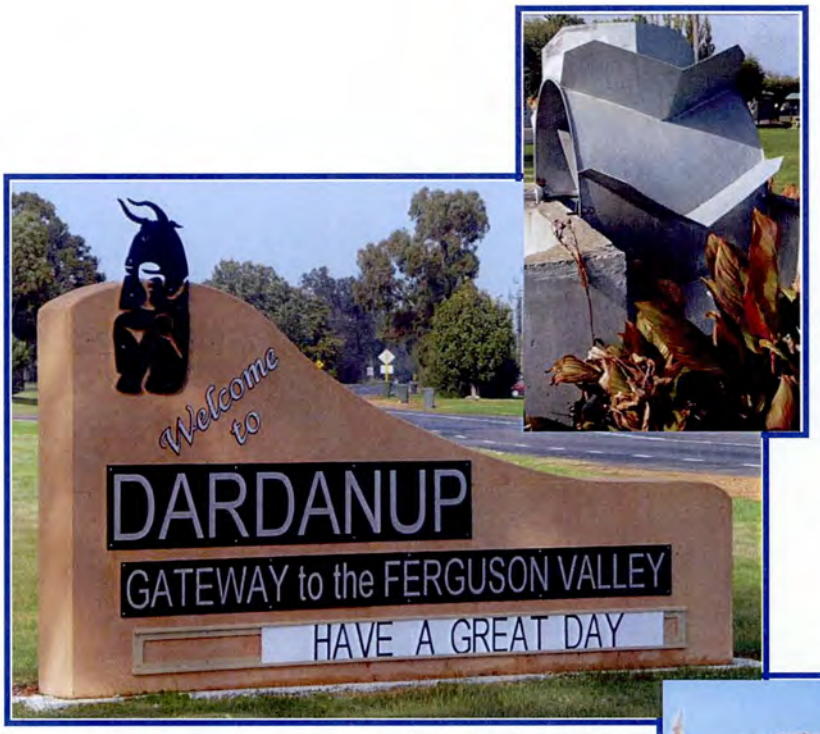
Date_____

Final Approval Granted

MINISTER FOR PLANNING

Date_____

Development Contribution Plan Report



SHIRE OF DARDANUP
PARADISE COUNTRY

2012

Dardanup Townsite Expansion Area (DCA2)

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1.0 Background

1.1 Dardanup Townsite Expansion Strategy 2009

In 2009, the Dardanup Townsite Expansion Strategy (DTES) was approved for the expansion of the townsite to cater for up to 4,000 people in a townsite of approximately 140 ha in total (Shire of Dardanup, 2009a).

The Dardanup Townsite currently consists of approximately 46 ha of land and 370 people (Shire of Dardanup, 2009). It contains a range of structures and facilities that are customary to a small town that was traditionally the service centre for the surrounding agricultural community. The increase in the townsite's population to over 3,000 people will result in a need for new, additional and upgraded community facilities and structures.

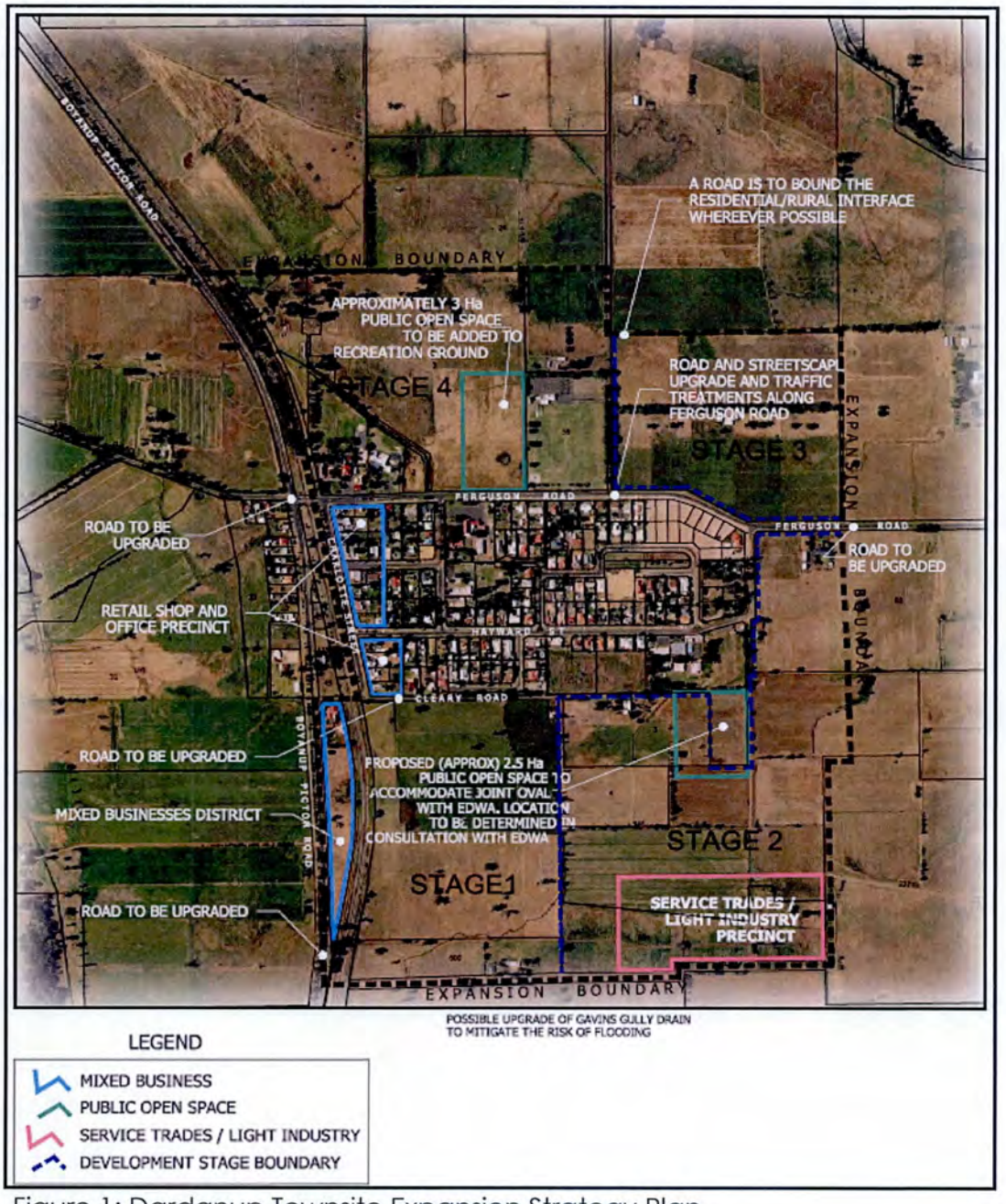

Figure 1: Dardanup Townsite Expansion Strategy Plan

1.2 State Planning Policy 3.6 2009

State Planning Policy 3.6 Development Contributions for Infrastructure (WA Government, 2009) was gazetted in November 2009 and sets out the principles and considerations that apply to development contributions for the provision of infrastructure in new and established urban areas. The objectives of the Policy are:

- *to promote the efficient and effective provision of public infrastructure and facilities to meet the demands arising from new growth and development;*
- *to ensure that development contributions are necessary and relevant to the development to be permitted and are charged equitably among those benefiting from the infrastructure and facilities to be provided;*
- *to ensure consistency and transparency in the system for apportioning, collecting and spending development contributions;*
- *to ensure the social well-being of communities arising from, or affected by, development.*

1.3 Shire of Dardanup Town Planning Scheme No. 3

The Shire of Dardanup Town Planning Scheme No. 3 (TPS No. 3) has recently been amended to include the model scheme text provisions from State Planning Policy 3.6 to allow for the collection of contributions from developments. The Dardanup Townsite Expansion Strategy Area is designated as a development contribution area (DCA2).

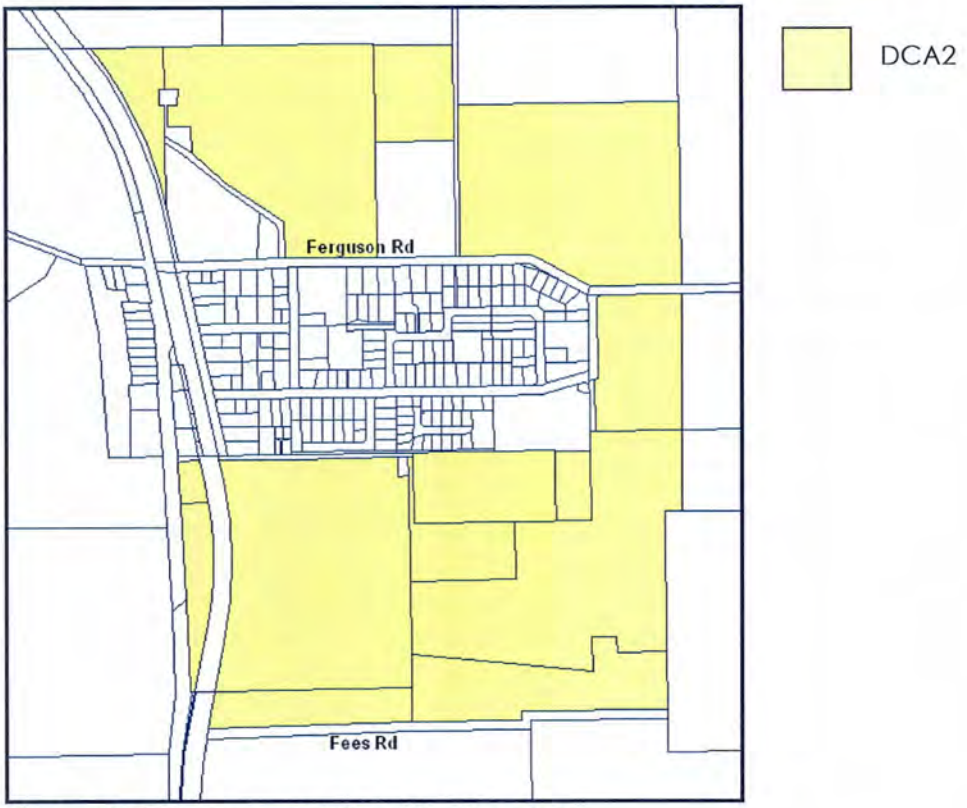

Figure 2: Development Contribution Area

TPS No. 3 requires the preparation of a:

- Development Contribution Plan (DCP) – this will provide:
  - the area subject to the Plan;
  - the project scope of works subject to the Plan;
  - priorities and timeframes to the projects;
  - cost calculations; and
  - apportionment method.

  The DCP has been prepared as Appendix XII to Town Planning Scheme No. 3.

- Development Contribution Plan Report (DCPR) – this will provide:
  - background information;
  - detailed project scope of works;
  - calculation method;
  - apportionment method;
  - priorities and timeframes; and
  - administrative matters.

  The DCPR is this document.

- Cost Apportionment Schedule – this will be appended to the DCPR and will provide landowners with their apportioned costs.

1.4 Shire of Dardanup Strategic Financial Plan

The Shire of Dardanup Strategic Financial Plan (adopted by Council on 12 April 2012) provides a strategic direction and funding mechanisms for the development and implementation of community services and facilities based on the anticipated needs of the Dardanup community.

The Plan is a dynamic document and is reviewed annually prior to Council setting their 4 Year Budget.

The Strategic Financial Plan identifies the following community infrastructure projects:

1. **Community Centre** - new community centre including outside play area to replace the ageing existing centre;
2. **Public Library** - extension of existing library to cater for population growth;
3. **Oval Club Rooms** - extension of existing building to increase usage opportunities;
4. **Hard Courts** - upgrade existing courts at the recreation grounds and provide additional courts. The additional courts are proposed in conjunction with the Senior Sports Oval. Due to the extended timeframe (2027/2028) this project has not been included in the DCP. Council may consider a specified area rate in the future to raise funds; and
5. **Car Parking** - upgrade existing parking areas at recreation grounds and provide additional parking areas.

2.0 Principles of Development Contribution Plan

This DCP Report has been prepared in accordance with the principles underlying development contributions, as provided in Clause 9.2.6 of TPS No. 3 as detailed below:

a. *The need and the nexus;*
The need for the facilities in the DCP must be clearly demonstrated (need) and the connection between the development and the demand created should be clearly established (nexus).

b. *Transparency;*
Both the method for calculating the development contribution and the manner in which is it applied should be clear, transparent and simple to understand and administer.

c. *Equity;*
Development contributions should be levied from all developments within a development contribution area, based on their relative contribution to need.

d. *Certainty;*
All development contributions should be clearly identified and the methods of accounting for cost adjustments determined at the commencement of a development.

e. *Efficiency;*
Development contributions should be justified on a whole of life capital cost basis consistent with maintaining financial discipline on service providers by precluding over-recovery of costs.

f. *Consistency;*
Development contributions should be applied uniformly across a development contribution area and the methodology for applying contributions should be consistent.

g. *Right of consultation and review; and*
Owners have the right to be consulted on the manner in which development contributions are determined. They have the opportunity to seek a review by an independent third party if they believe the calculation of costs of the contributions is not reasonable.

h. *Accountability;*
There must be accountability in the manner in which development contributions are determined and expended.

3.0 Contribution Apportionment

As provided in Section 1.3, the DCA contains the majority of the Dardanup Townsite Expansion Strategy area. In accordance with Clause 9.2.9 of TPS No. 3, a proportion of the area has been excluded from the DCA and therefore doesn't need to contribute to the DCP. Table 1 provides a summary of the DCA:

Table 1: Development Contribution Land Area

Description	Area (ha)
Dardanup Townsite Expansion Strategy Area	173.2191
Exclusions:	
Dardanup Primary School (Lot 106)	(25.1249)
Church Site (Lot 2)	(3.6652)
Private School (Lot 3)	(3.6478)
Recreation Ground (Lot 55)	(4.0521)
Existing Townsite	(34.2705)
Existing Road/Drainage Reserves in DCA	(3.2252)
Existing Railway Reserve	(2.5132)
Water Corporation Infrastructure	(1.2680)
Total Exclusions	(77.7669)
Sub Total DCA	95.4522
New Public Open Space (10%)	(9.5452)
Total DCA	**85.9069**

There are currently 12 land parcels subject to the DCA and Table 2 summarises these:

Table 2: DCA Land Ownership

Owner	Property	Gross Area (ha)	10% POS (ha)	Net Area (ha)	% of DCA
E J Suter	Lot 1 Charlotte St	0.4631	0.4631	**0.4167**	0.49
Thomas Fields Pty Ltd	Lot 76 Boyanup-Picton Rd	18.9890	1.8989	**17.0901**	19.89
F X Panizza	Lot 25 Boyanup-Picton Rd	2.0614	0.2061	**1.8552**	2.16
E A Gobby	Lot 600 Fees Rd	3.2562	0.3256	**2.9305**	3.41
C & J Stelmach, G & B Yuill	Lot 601 Fees Rd	6.4921	0.6492	**5.8428**	6.80
Tank Road Pty Ltd	Lot 100 Fees Rd	15.8427	1.5842	**14.2584**	16.60
S & M Spencer	Lot 4 Clearys Rd	2.8839	0.2883	**2.5955**	3.02
S & T McGill	Lot 201 Clearys Rd	4.4985	0.4498	**4.0486**	4.71
T & L Ferris	Lot 80 Ferguson Rd	5.2511	0.5251	**4.7259**	5.50
F X Panizza	Lot 3 Ferguson Rd	15.5930	1.5593	**14.0337**	16.34
A & B Mountford	Lot 23 Recreation Rd	16.6490	1.6649	**14.9841**	17.44
Dardanup Butchering Co	Lot 24 Recreation Rd	3.4722	0.3472	**3.1249**	3.64
TOTAL		**95.4522**	**9.5452**	**85.9069**	**100**

[1] Owner details current as at July 2012.

The Projects identified in Section 1.4 have been apportioned as follows in Table 3:

Table 3: Project Apportionment

Project	Developer[1]	Council	External Funding[2]
Hard Courts	1/3	1/3	1/3
Community Centre	1/3	1/3	1/3
Public Library	1/3	1/3	1/3
Oval Club Rooms	1/3	1/3	1/3
Car Parking	1/2	1/2	

[1] Developer is also liable for 100% of the administration costs.
[2] External funding is subject to a competitive grant application process. If a grant is not secured, the Council's proportion of costs will increase.

4.0 Contribution Calculation Method

The initial costs of the projects were estimated utilising Rawlinsons Australian Construction Handbook 2011. All project costs include:

- Design Costs
- Administration Costs
- Contingency

4.1 Design Costs

A design cost has been included in the total project cost which will be used for the cost of architects, builders and the like in designing and preparing construction drawings for the project. The design cost is 15% of the estimated construction cost and is apportioned evenly between the developer, Council and external funding sources.

4.2 Administration Costs

An administration fee has been included in the total project cost which will be used to recover costs for preparing, maintaining and implementing the DCP. The administration fee is 4% of the estimated construction cost and the developer will be required to contribute 100% of these costs.

4.3 Contingency

A contingency of 15% of the estimated construction cost has been included in the total project cost, of which is apportioned evenly between the developer, Council and external funding sources. The contingency will accommodate the accuracy of estimates made to date and will cover exclusions from the initial estimates that will not be known until detailed design work has been completed.

4.4 Escalation of Costs

The costs estimated in 2011 will not reflect the actual construction cost of a project at the designated construction time. Therefore, there is a need to escalate the costs to ensure the contributions collected reflect the future construction value of the project. The Building Price Index (BPI) demonstrates the change in

construction costs over time. For the purpose of this DCP, the BPI provided by Rawlinsons will be adopted and is based on the 10 year average for Bunbury. To June 2011, the 10 year average BPI was 6.95%.

4.5 Calculation Method

The cost contributions are calculated using the following formula:

Cost Contribution = Future Cost Total x % Total Net Area

Future Cost Total = Estimated total cost of DCP at time of construction;
% Total Net Area = developers proportion of the total net DCA;

For example, Lot Z has a proportion of 3.20% for a DCP worth $5 Million. The calculation for Lot Z would be:

$5,000,000.00 x 3.20% = $160,000

If Lot Z has a net land area of 2.5ha, the rate per hectare of land would be $64,000 / ha using the following formula:

$/ha = Developer Cost Contribution / net land area

Net Land Area = the area of land holding excluding required 10% public open space land;

5.0 Scope of Works, Timing and Priorities

The following details the scope of works and timing for the identified projects. The adopted construction time reflects the project's priority. The project costs identified includes the design and contingency costs whilst the developer's apportioned costs include the DCP administration costs.

5.1 Hard Courts

The recreation ground currently has 5 existing hard courts utilised by a number of sports such as tennis, netball and basketball. The tennis courts have recently been resurfaced and the DCP proposes to resurface and re-linemark the remaining 3 courts, replace the backboards and supporting posts for the remaining 3 courts and install lighting for night games/ training for all courts.

Estimated Cost in 2011: $193,997

Estimated Cost in 2017/2018: $246,774
DCP Administration Cost: $9,871
Total $256,645

Apportioned Costs
Council $82,258
Developer $92,129
External funding $82,258
Total $256,645

5.2 Community Centre

The earliest part of the Community Centre was built in the early 1970's with an extension having been constructed in the early 1990's. The Centre has a total floor space of approximately 260m² with two main community rooms and Infant Health Centre. The Centre is in need of major renovation including an internal redesign. Given the costs involved and the age of the building, it is considered that a new building closer to existing civic buildings would be more financially viable. Through the DCP, a new building is proposed to be constructed adjoining the existing Shire sub-office and Town Hall. The new building is proposed to be approximately 170m² which will include the following:

1. Kitchen;
2. Toilets;
3. Main activity area;
4. Office space;
5. Infant Health Clinic;
6. Outdoor play area of approximately 140m².

Estimated Cost in 2011: $375,085

Estimated Design Cost in 2014/2015: $52,944
Estimated Cost in 2017/2018: $496,557
DCP Administration Cost: $19,862
Total $569,363

Apportioned Costs
2014/2015 – Detailed Design Work
Council $17,648
Developer..... $17,648
External funding $17,648
Total $52,944

2017/2018 – Construction
Council $165,519
Developer..... $185,381
External funding $165,519
Total $516,419

Total for Project $569,363

5.3 Public Library

The Public Library is currently approximately 60m² and is well utilised by the community. Based on the currently population of the Townsite, the library is in need of a 20m² extension which will be undertaken by Council in the near future. The projected additional population will create a need for an additional 40m² of library space. Through the DCP, an extension to the library is proposed to increase its floor area by 40m² to a total of 120m².

Estimated Cost in 2011: $170,118

Estimated Cost in 2020/2021: $311,442
DCP Administration Cost: $12,458
Total $323,900

Apportioned Costs
Council $103,814
Developer..... $116,272
External funding $103,814
Total $323,900

5.4 Oval Club Rooms

The components of the club rooms have been constructed in three stages. The original portion of the centre was built sometime prior to 1988 and was approximately 50m². Stage 2 consisted of the tennis club in 1988 of approximately 22m² and stage 3 extended the main building in 2000 by approximately 200m². The main building contains a main gathering area, kitchen, toilets and change rooms, store rooms and canteen. The club rooms is well utilised by a number of sporting and non-sporting clubs and requires extensions to cater for the future population increase. Adjacent to the club there is an existing club room of 30m² currently utilised by the Tennis Club which will be demolished to be replaced by the proposed extension. Through the DCP, major renovations/additions to the building are proposed. The DCP proposes to increase the floor area by 94m² to include:

1. New Change Rooms;
2. New Public Toilets (existing public toilet building to be demolished);

Verandahs of approximately 54m² around the building are also proposed in order to provide undercover viewing by spectators.

Estimated Cost in 2011: $413,127

Estimated Design Cost in 2017/2018: $71,338
Estimated Cost in 2020/2021: $669,059
DCP Administration Cost: $26,762
Total $767,159

Apportioned Costs
2017/2018 – Detailed Design Costs
Council $23,779
Developer $23,779
External funding $23,779
Total $71,337

2020/2021 – Construction
Council $223,020
Developer $249,782
External funding $223,020
Total $695,822

Total for Project $767,159

5.5 Car Parking

The recreation ground currently has a designated car park for approximately 20 cars. There is a grassed area adjoining the existing hard courts that it also used for car parking. The DCP proposes to upgrade the existing car parking area (upgrade surface and linemark) and also to formalise the grassed parking area with a constructed car park for approximately 70 additional cars.

Estimated Cost in 2011:	$330,063
Estimated Cost in 2020/2021:	$604,260
DCP Administration Cost:	$24,170
Total	$628,430

Apportioned Costs

Council	$302,130
Developer	$326,300
Total	$628,430

5.6 Scope of Works Summary

Table 5 provides a summary of the scope of works including timeframe, costs and apportionment.

Table 4: Scope of Works Summary

Priority	Project	Construction Date	Council Contribution	Developer Contribution	External Funding	Total
1	Hard Courts Upgrade	2017/2018	$82,258	$92,129	$82,258	$256,645
2	Community Centre	2017/2018	$183,167	$203,029	$183,167	$569,363
3	Car Parking	2020/2021	$302,130	$326,300	$-	$628,430
4	Oval Club Rooms	2020/2021	$246,799	$273,561	$246,799	$767,159
5	Public Library	2020/2021	$103,814	$116,272	$103,814	$323,900
	TOTAL		**$918,168**	**$1,011,291**	**$616,038**	**$2,545,497**

6.0 Cost Schedule

A cost apportionment schedule has been prepared for landowners within the DCA and is appended to the DCP. The schedule provides the following information:

- Current landowner;
- Property address;
- Gross land area;
- Area of required 10% public open space;
- Net land area (gross area less 10% public open space);
- Landowner's proportion of total net DCA area; and
- Total future cost (total developer contribution / proportion of net DCA area).

The schedule also provides for Council and the landowner to monitor the net area of land developed and their remaining contribution.

7.0 Strategic Finance

The following flow chart in Figure 3 demonstrates the DCP's relationship to other strategic plans of the Shire:

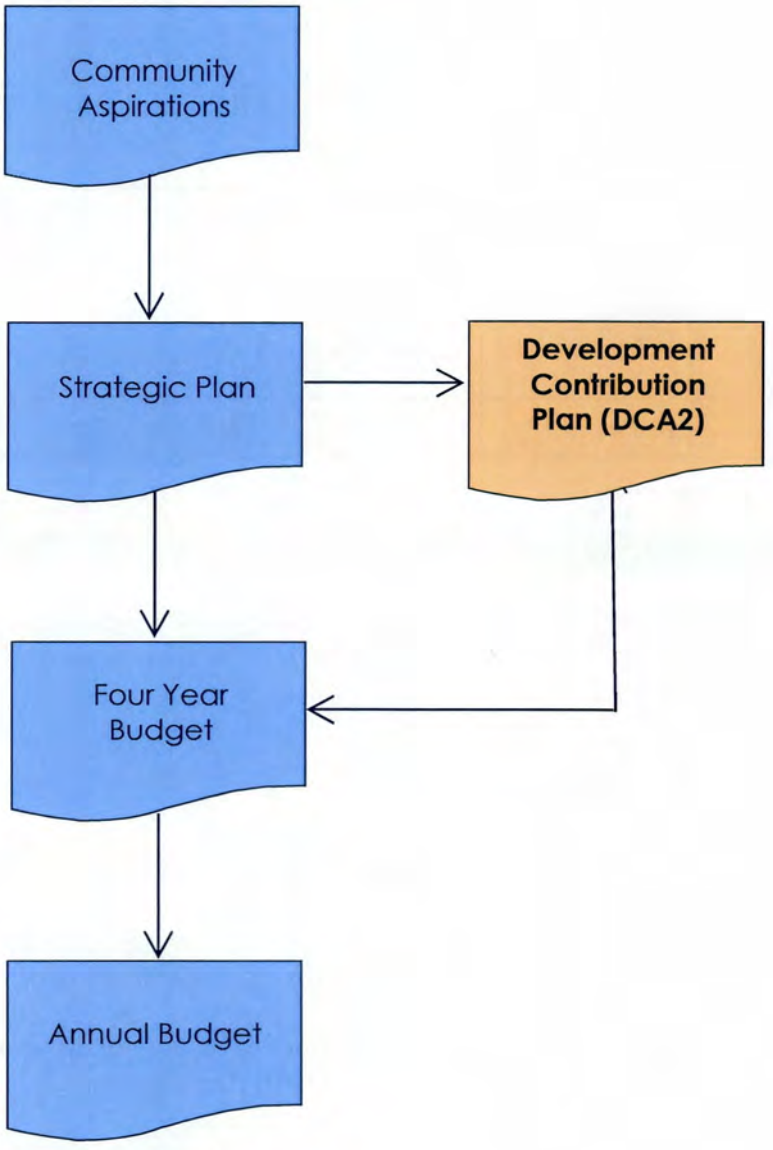

Figure 3: Strategic Finance Relationships

8.0 Review

All aspects of the DCP will be reviewed not less than annually, allowing for more frequent reviews to be completed on an as-required basis having regard to cost increases and the rate of development in the DCA.

- The construction cost will be reviewed at least annually utilizing Rawlinsons Australian Construction Handbook.
- The BPI used to forecast future construction costs will be reviewed at least annually.
- The construction cost of major projects will be confirmed upon completion of detailed design work and detailed costings.

9.0 References

Rawlinsons 2011, *Australian Construction Handbook 2011*, Rawlinsons Publishing, Perth WA.

Shire of Dardanup 2009, *Population & Demographics: Projections*, Eaton WA.

Shire of Dardanup 2009a, *Dardanup Townsite Expansion Strategy Map*, Eaton WA.

WA Government 2009, *State Planning Policy 3.6 Development Contributions for Infrastructure*, WA Government Gazette, 20 November 2009 No. 211 Special, Government Printer, WA.

10.0 Cost Apportionment Schedule

DCA 2 - DARDANUP TOWNSITE EXPANSION AREA
2012/2013 COST APPORTIONMENT SCHEDULE

Owner	Property	Gross area (ha)	10% POS (ha)	Net area (ha)	% of total net area	Total Future Cost	Net area developed (ha)	Net area undeveloped (ha)	% developed	Collected	Remaining Contribution	$/ha
E J Suter	Lot 1 Charlotte St	0.4631	0.0463	0.4168	0.49%	$ 4,906	0.0000	0.4168	0.0%	$ -	$ 4,906	$ 11,772
Thomas Fields Pty Ltd	Lot 76 Boyanup-Picton Rd	18.9890	1.8989	17.0901	19.89%	$ 201,184	0.0000	17.0901	0.0%	$ -	$ 201,184	$ 11,772
F X Panizza	Lot 25 Boyanup-Picton Rd	2.0614	0.2061	1.8553	2.16%	$ 21,840	0.0000	1.8553	0.0%	$ -	$ 21,840	$ 11,772
E A Gobby	Lot 600 Fees Rd	3.2562	0.3256	2.9306	3.41%	$ 34,499	0.0000	2.9306	0.0%	$ -	$ 34,499	$ 11,772
C & J Stelmach, G & B Yuill	Lot 601 Fees Rd	6.4921	0.6492	5.8429	6.80%	$ 68,782	0.0000	5.8429	0.0%	$ -	$ 68,782	$ 11,772
Tank Road Pty Ltd	Lot 100 Fees Rd	15.8427	1.5843	14.2584	16.60%	$ 167,849	0.0000	14.2584	0.0%	$ -	$ 167,849	$ 11,772
S & M Spencer	Lot 4 Clearys Rd	2.8839	0.2884	2.5955	3.02%	$ 30,554	0.0000	2.5955	0.0%	$ -	$ 30,554	$ 11,772
S & T McGill	Lot 201 Clearys Rd	4.4985	0.4499	4.0487	4.71%	$ 47,660	0.0000	4.0487	0.0%	$ -	$ 47,660	$ 11,772
T & L Ferris	Lot 80 Ferguson Rd	5.2511	0.5251	4.7260	5.50%	$ 55,634	0.0000	4.7260	0.0%	$ -	$ 55,634	$ 11,772
F X Panizza	Lot 3 Ferguson Rd	15.5930	1.5593	14.0337	16.34%	$ 165,204	0.0000	14.0337	0.0%	$ -	$ 165,204	$ 11,772
A & B Mountford	Lot 23 Recreation Rd	16.6490	1.6649	14.9841	17.44%	$ 176,392	0.0000	14.9841	0.0%	$ -	$ 176,392	$ 11,772
Dardanup Butchering Co	Lot 24 Recreation Rd	3.4722	0.3472	3.1250	3.64%	$ 36,787	0.0000	3.1250	0.0%	$ -	$ 36,787	$ 11,772
	TOTAL	95.4522	9.5452	85.9070	100%	$1,011,292	0.0000	85.9070	0.0000	$ -	$1,011,292	

(Appendix ORD: 12.2.2A)

11.5.5 *Title: Final Adoption of Town Planning Scheme No. 3 Amendment No. 177 – Special Control Area (Shire of Dardanup)*

Reporting Department:	*Development Services Directorate*
Reporting Officer:	*Mrs Elizabeth Edwards – Principal Planning Officer*
Legislation:	*Planning and Development Act 2005* *Town Planning Regulations 1967*
File Number:	*PL113177*

DECLARATION OF INTEREST

Cr. L D Harris declared a Financial Interest in this item as he is a partner in the development.
Cr. L D Harris left the room [4.40pm].

Background

Location:	Burekup Townsite Expansion Strategy Area Dardanup Townsite Expansion Strategy Area

Council resolved at its meeting held on 6 April 2011 [Res 73/11] to finalise Amendment 177 to Town Planning Scheme No. 3 to introduce special control area provisions into the TPS to allow for the creation of development contribution areas to receive funds from developers towards community infrastructure. The amendment was forwarded to the Western Australian Planning Commission (WAPC) for approval.

The WAPC requested modifications to the amendment to be consistent with State Planning Policy 3.6 Developer Contributions (SPP). The amendment initially proposed to locate the Developer Contribution Plan outside the TPS as a Local Planning Policy. The SPP requires the Developer Contribution Plan to be part of the TPS and previous discussions with local WAPC officers indicated that our initial proposal would be acceptable. However, apparently the WAPC office in Perth would not accept this.

Legal Implications - No appeal rights exist.

Strategic Plan - None.

Environment - None.

Precedents - None.

Budget Implications - None.

Budget – Whole of Life Cost - None.

Council Policy Compliance - None.

Officer Comment

The amendment has been modified to include the Developer Contribution Plan in the TPS. The Cost Apportionment Schedule (which advises the developer of their financial contribution) will still be outside the TPS and can therefore be adjusted as required.

The Developer Contribution Plan and Cost Apportionment Schedule were advertised to all landowners that that would be subject to the Developer Contribution Plan. At the conclusion of the advertising period, no submissions were received.

A copy of the current cost apportionment schedule is included as (Appendix ORD: 11.5.5).

Council Role Quasi-judicial.

Voting Requirements - Simple Majority.

OFFICER RECOMMENDED RESOLUTION & COUNCIL RESOLUTION

262/12 MOVED - Cr. M T Bennett SECONDED - Cr. P Robinson

THAT Council:

1. Pursuant to Section 87(1) of the Planning and Development Act 2005, adopt Amendment No. 177 to Town Planning Scheme No. 3 to:

A. Insert a new 'Part IX – Special Control Areas' into the Scheme text as follows:

PART IX – SPECIAL CONTROL AREAS

9.1 Operation of special control areas

9.1.1 The following special control areas are shown on the scheme map—

(a) Development contribution areas shown on the scheme map as DCA with a number and included in Appendix XI.

9.1.2 In respect of a special control area shown on a scheme map, the provisions applying to the special control area apply in addition to the provisions applying to any underlying zone or reserve and any general provisions of the scheme.

9.2 Development contribution areas

9.2.1 Interpretation

In clause 9.2, unless the context otherwise requires—

'Administrative costs' means such costs as are reasonably incurred for the preparation and (with respect to standard infrastructure items) implementation of the development contribution plan.

'Administrative items' means the administrative matters required to be carried out by or on behalf of the local government in order to prepare and (with respect to standard infrastructure items) implement the development contribution plan, including legal, accounting, planning engineering, and other professional advice.

'Cost apportionment schedule' means a schedule prepared and distributed in accordance with clause 9.2.10.

'Cost contribution' means the contribution to the cost of infrastructure and administrative costs.
'Development contribution area' means shown on the scheme map as DCA with a number and included in Appendix XI.

'Development contribution plan' means a development contribution plan prepared in accordance with the provisions of State Planning Policy 3.6 Development Contributions for Infrastructure and the provisions of this clause 9 of the Scheme.

'Development contribution plan report' means a report prepared and distributed in accordance with clause 9.2.10.

'Infrastructure' means the standard infrastructure items and community infrastructure, including recreational facilities; community centres; child care and after school centres; libraries and cultural facilities and such other services and facilities for which development contributions may reasonably be requested having regard to the objectives, scope and provisions of State Planning Policy 3.6 Development Contributions.

'Infrastructure costs' means such costs as are reasonably incurred for the acquisition and construction of infrastructure.

'Local government' means the local government or local governments in which the development contribution area is located or through which the services and facilities are provided.

'Owner' means an owner of land that is located within a development contribution area.

9.2.2 Purpose

The purpose of having development contribution areas is to—

(a) provide for the equitable sharing of the costs of infrastructure and administrative costs between owners;

(b) ensure that cost contributions are reasonably required as a result of the subdivision and development of land in the development contribution area; and

(c) coordinate the timely provision of Infrastructure.

9.2.3 Development contribution plan required

9.2.3.1 A development contribution plan is required to be prepared and adopted for each development contribution area.

9.2.3.2 The local government shall, within 28 days of adopting a development contribution plan, forward a copy of the adopted development contribution plan to the Commission.

9.2.4 Development contribution plan part of Scheme

The development contribution plan is incorporated in Appendix XII as part of this Scheme.

9.2.5 Subdivision, strata subdivision and development

9.2.5.1 The local government shall not withhold its support for subdivision, strata subdivision or refuse to approve a development solely for the

reason that a development contribution plan is not in effect, there is no approval to advertise a development contribution plan, or that there is no other arrangement with respect to an owner's and/or subdivider's contribution towards the provision of community infrastructure.

9.2.5.2 The Commission may impose a condition requiring the preparation and implementation of a development contribution plan on subdivision approvals which relate to land included in a development contribution area.

9.2.5.3 The local government shall impose a condition for development requiring the owner to make a cost contribution payment in accordance with the cost apportionment schedule prepared as part of the development contribution plan required under clause 9.2.

9.2.6 Guiding principles for development contribution plans

The development contribution plan for any development contribution area is to be prepared in accordance with the following principles—

a) Need and the nexus

The need for the infrastructure included in the plan must be clearly demonstrated (need) and the connection between the development and the demand created should be clearly established (nexus).

b) Transparency

Both the method for calculating the development contribution and the manner in which it is applied should be clear, transparent and simple to understand and administer.

c) Equity

Development contributions should be levied from all developments within a development contribution area, based on their relative contribution to need.

d) Certainty

All development contributions should be clearly identified and methods of accounting for cost adjustments determined at the commencement of a development.

e) Efficiency

Development contributions should be justified on a whole of life capital cost basis consistent with maintaining financial discipline on service providers by precluding over recovery of costs.

f) Consistency

Development contributions should be applied uniformly across a development contribution area and the methodology for applying contributions should be consistent.

g) Right of consultation and review

Owners and/or subdividers have the right to be consulted on the manner in which development contributions are determined. They also have the opportunity to seek a review by an independent third party if they believe the calculation of the costs of the contributions is not reasonable.

h) Accountable

There must be accountability in the manner in which development contributions are determined and expended.

9.2.7 Content of development contribution plans

9.2.7.1 The development contribution plan is to specify—

(a) the development contribution area to which the development contribution plan applies;

(b) the infrastructure and administrative items to be funded through the development contribution plan;

(c) the method of determining the cost contribution of each owner and or subdivider; and

(d) the priority and indicative timing for the provision of infrastructure.

9.2.7.2 A development contribution plan may take the form of a voluntary agreement between the local government and owner's and/or subdivider's in a development contribution area.

9.2.8 Period of development contribution plan

A development contribution plan shall specify the period during which it is to operate.

9.2.9 Land excluded

In calculating both the area of an owner's and/or subdivider's land and the total area of land in a development contribution area, the area of land provided in that development contribution area for—

a) roads designated under the Greater Bunbury Region Scheme as primary regional roads and other regional roads;

b) existing public open space;

c) existing government primary and secondary schools; and

d) such other land as excluded in the development contribution plan,

is to be excluded.

9.2.10 Development contribution plan report and cost apportionment schedule

9.2.10.1 Within 90 days of the development contribution plan coming into effect, the local government is to adopt and make available a development contribution plan report and cost apportionment schedule to all owners and/or subdividers in the development contribution area.

9.2.10.2 The development contribution plan report and the cost apportionment schedule shall set out in detail the calculation of the cost contribution for each

owner and or subdivider in the development contribution area, based on the methodology provided in the development contribution plan, and shall take into account any proposed staging of the development.

9.2.10.3 The development contribution plan report and the cost apportionment schedule do not form part of the scheme, but once adopted by the local government they are subject to review as provided under clause 9.2.11.

9.2.11 Cost contributions based on estimates

9.2.11.1 The determination of Infrastructure costs and administrative costs is to be based on amounts expended, but when expenditure has not occurred, it is to be based on the best and latest estimated costs available to the local government and adjusted accordingly, if necessary.

9.2.11.2 Where a cost apportionment schedule contains estimated costs, such estimated costs are to be reviewed at least annually by the local government—

(a) in the case of land to be acquired, in accordance with clause 9.2.12; and

(b) in all other cases, in accordance with the best and latest information available to the local government, until the expenditure on the relevant item of infrastructure or administrative costs has occurred.

9.2.11.3 The local government may have such estimated costs independently certified by appropriate qualified persons and must provide such independent certification to an owner and or subdivider when requested to do so.

9.2.11.4 Where any cost contribution has been calculated on the basis of an estimated cost, the local government—

(a) is to adjust the cost contribution of any owner and or subdivider in accordance with the revised estimated costs; and

(b) may accept a cost contribution, based upon estimated costs, as a final cost contribution and enter into an agreement with the owner and or subdivider accordingly.

9.2.11.5 Where an owner's and/or subdivider's cost contribution is adjusted under clause 9.2.11.4, the local government, on receiving a request in writing from an owner and/or subdivider, is to provide the owner and/or subdivider with a copy of estimated costs and the calculation of adjustments.

9.2.11.6 If an owner and/or subdivider objects to the amount of a cost contribution, the owner and/or subdivider may give notice to the local government requesting a review of the amount of the cost contribution by an appropriate qualified person ('independent expert') agreed by the local government and the owner and/or subdivider at the owner's and/or subdivider's expense, within 28 days after being informed of the cost contribution.

9.2.11.7 If the independent expert does not change the cost contribution to a figure acceptable to the owner and/or subdivider, the cost contribution is to be determined—

(a) by any method agreed between the local government and the owner and/or subdivider; or

(b) if the local government and the owner and/or subdivider cannot agree on a method pursuant to (a) or on an independent expert, by arbitration in accordance with the Commercial Arbitration Act 1985, with the costs to be shared equally between the local government and owner and/or subdivider.

9.2.12 Valuation

9.2.12.1 Clause 9.2.12 applies in order to determine the value of land to be acquired for the purpose of providing Infrastructure.

9.2.12.2 In clause 9.2.12—

'Value' means the fair market value of land, at a specified date, which is defined as the capital sum that would be negotiated in an arm's length transaction in an open and unrestricted market, assuming the highest and best use of the land with all its potential and limitations (other than the limitation arising from the transaction for which the land is being valued), wherein the parties act knowledgeably, prudently and without compulsion to buy or sell.

'Valuer' means a licensed valuer or the Valuer-General as determined by the local government,

9.2.12.3 If an owner and/or subdivider objects to a valuation made by the valuer, the owner and/or subdivider may give notice to the local government requesting a review of the amount of the value, at the owner's and/or subdivider's expense, within 28 days after being informed of the value.

9.2.12.4 If, following a review, the valuer's determination of the value of the land is still not a figure acceptable to the owner and/or subdivider, the value is to be determined—

(a) by any method agreed between the local government and the owner and/or subdivider; or

(b) if the local government and the owner and/or subdivider cannot agree, the owner and/or subdivider may apply to the State Administrative Tribunal for a review of the matter under part 14 of the Planning and Development Act 2005.

9.2.13 Liability for cost contributions

9.2.13.1 An owner and/or subdivider must make a cost contribution in accordance with the applicable development contribution plan and the provisions of clause 9.2.

9.2.13.2 The Commission shall impose a condition for subdivision requiring the owner and/or subdivider to make a cost contribution payment in accordance with the cost apportionment schedule

prepared as part of the development contribution plan required under clause 9.2.

9.2.13.3 An owner and/or subdivider shall pay the owner's and/or subdivider's cost contribution payment to the local government on the earlier of –

(a) a proponent seeking clearance of conditions of subdivision from the local government;

(b) the Western Australian Planning Commission endorsing its approval on the deposited plan or survey strata plan of the subdivision of the owner's and/or subdivider's land within the development contribution area;

(c) the commencement of any development on the owner's and/or subdivider's land within the development contribution area;

(d) the approval of any strata plan by the local government or Western Australian Planning Commission on the owner's and/or subdivider's land within the development contribution area; or

(e) the approval of a change or extension of use by the local government on the owner's and/or subdivider's land within the development contribution area.

The liability to pay the cost contribution payment arises only once upon the earliest of the above listed events.

9.2.13.4 Notwithstanding clause 9.2.13.3, an owner's and/or subdivider's liability to pay the owner's and/or subdivider's cost contribution does not arise if the owner and/or subdivider commences development of the first single house or outbuildings associated with that first single house on an existing lot which has not been subdivided or strata subdivided since the coming into effect of the development contribution plan.

9.2.13.5 Where a development contribution plan expires in accordance with clause 9.2.8, an owner's and/or subdivider's liability to pay the owner's and/or subdivider's cost contribution under that

development contribution plan shall be deemed to continue in effect and be carried over into any subsequent development contribution plan which includes the owner's and/or subdivider's land, subject to such liability.

9.2.14 Payment of cost contribution

9.2.14.1 The owner and/or subdivider, with the agreement of the local government, is to pay the owner's and/or subdivider's cost contribution by—

(a) cheque or cash;

(b) transferring to the local government or a public authority land in satisfaction of the cost contribution;

(c) the provision of physical infrastructure;

(d) some other method acceptable to the local government; or

(e) any combination of these methods.

9.2.14.2 The owner and/or subdivider, with the agreement of the local government, may pay the owner's and/or subdivider's cost contribution in a lump sum, by instalments or in such other manner acceptable to the local government.

9.2.14.3 Payment by an owner and/or subdivider of the cost contribution, including a cost contribution based upon estimated costs in a manner acceptable to the local government, constitutes full and final discharge of the owner's and/or subdivider's liability for the portion of land subject to the contribution under the development contribution plan and the local government shall provide certification in writing to the owner and/or subdivider of such discharge if requested by the owner and/or subdivider.

9.2.15 Charge on land

9.2.15.1 The amount of any cost contribution for which an owner and/or subdivider is liable under clause 9.2.13, but has not paid, is a charge on the owner's and/or subdivider's land to which the cost contribution relates, and the local government may lodge a caveat, at the owner's and/or

subdivider's expense, against the owner's and/or subdivider's certificate of title to that land.

9.2.15.2 The local government, at the owner's and/or subdivider's expense and subject to such other conditions as the local government thinks fit, can withdraw a caveat lodged under clause 9.2.15.1 to permit a dealing and may then re-lodge the caveat to prevent further dealings.

9.2.15.3 If the cost contribution is paid in full, the local government, if requested to do so by the owner and/or subdivider and at the expense of the owner and/or subdivider, is to withdraw any caveat lodged under clause 9.2.15.

9.2.16 Administration of funds

9.2.16.1 The local government is to establish and maintain a reserve account in accordance with the Local Government Act 1995 for each development contribution area into which cost contributions for that development contribution area will be credited and from which all payments for the infrastructure costs and administrative costs within that development contribution area will be paid. The purpose of such a reserve account or the use of money in such a reserve account is limited to the application of funds for that development contribution area.

9.2.16.2 Interest earned on cost contributions credited to a reserve account in accordance with clause 9.2.16.1 is to be applied in the development contribution area to which the reserve account relates.

9.2.17 Shortfall or excess in cost contributions

9.2.17.1 If there is a shortfall in the total of cost contributions when all cost contributions have been made or accounted for in a particular development contribution area, the local government may—

(a) make good the shortfall;

(b) enter into agreements with owners and/or subdividers to fund the shortfall; or

(c) raise loans or borrow from a financial institution,

but nothing in paragraph 9.2.17.1(a) restricts the right or power of the local government to impose a differential rate to a specified development contribution area in that regard.

9.2.17.2 If there is an excess in funds available to the development contribution area when all cost contributions have been made or accounted for in a particular development contribution area, the local government is to refund the excess funds to contributing owners and/or subdividers for that development contribution area. To the extent, if any, that it is not reasonably practicable to identify owners and/or subdividers and/or their entitled amount of refund, any excess in funds shall be applied, to the provision of additional facilities or improvements in that development contribution area.

9.2.18 Powers of the local government

The local government in implementing the development contribution plan has the power to—

(a) acquire any land or buildings within the scheme area under the provisions of the Planning and Development Act 2005; and

(b) deal with or dispose of any land which it has acquired under the provisions of the Planning and Development Act 2005 in accordance with the law and for such purpose may make such agreements with other owners and/or subdividers as it considers fit.

9.2.19 Arbitration

Subject to clauses 9.2.12.3 and 9.2.12.4, any dispute between an owner and/or subdivider and the local government in connection with the cost contribution required to be made by an owner and/or subdivider is to be resolved by arbitration in accordance with the Commercial Arbitration Act 1985.

B) Insert a new 'Appendix XI – Development Contribution Areas' into the Scheme text as follows:

APPENDIX XI – DEVELOPMENT CONTRIBUTION AREAS

DEVELOPMENT CONTRIBUTION AREA (DCA) NO.	DCA NAME	LAND DESCRIPTION	DEVELOPMENT CONTRIBUTION PLAN (DCP)

C) Include 'Special Control Area' on the Scheme Map legend as shown on the Amendment map.

D) Include 'DCA – Development Contribution Area' under 'Special Control Area' on the Scheme Map legend as shown on the Amendment map.

E) Include land within the Dardanup Townsite Expansion Strategy Area as 'DCA2' and land within the Burekup Townsite Expansion Strategy Area as 'DCA3' and amend the Scheme text as follows:

APPENDIX XI – DEVELOPMENT CONTRIBUTION AREAS

DEVELOPMENT CONTRIBUTION AREA (DCA) NO.	DCA NAME	LAND DESCRIPTION	DEVELOPMENT CONTRIBUTION PLAN (DCP)
DCA2	Dardanup Townsite Expansion Strategy Area	Land identified within the Dardanup Townsite Expansion Strategy	Dardanup Townsite Expansion Area DCP
DCA3	Burekup Townsite Expansion Strategy Area	Land identified within the Burekup Townsite Expansion Strategy	Burekup Townsite Expansion Area DCP

F) Amending the Scheme Map by including the Dardanup Townsite Expansion Strategy Area and the Burekup Townsite Expansion Strategy Area in the 'Special Control Area' and 'Development Contribution Area' as shown on the Amendment Map.

G) Insert a new 'Appendix XII – Community Infrastructure Development Contribution Plans' into the Scheme text as follows:

APPENDIX XII – COMMUNITY INFRASTRUCTURE DEVELOPMENT CONTRIBUTION PLANS

Reference No.	**DCP 2**
Area Name:	**DCA 2 – DARDANUP TOWNSITE EXPANSION AREA**
Relationship to other planning instruments:	**The development contribution plan generally conforms to the *Strategic Plan, 10 year Strategic Financial Plan, Dardanup Revitalisation Project Concept Plan and Community Aspirations.***
Infrastructure and administrative items to be funded:	**NEW INFRASTRUCTURE** **1. Community Centre & Outdoor Play Area:** • To be located at the existing Civic Centre on Little Street adjoining the Hall and Shire offices; • Single storey of approximately 170m^2 of standard finishes containing kitchen, toilets, main activity area, office space and infant health clinic; • Outdoor play area of approximately 140m^2 to include 1.8m high chain mesh surrounding fence, turf and reticulation; • Costs are inclusive of: o Planning and design; o Construction of facility; o External services within 3m of building; o Contingency to cover exclusions such as external services beyond 3m of building and unforeseen expenditure. **UPGRADED INFRASTRUCTURE** **2. Hard Courts at Dardanup Oval:** • Upgrade lighting for all 5 courts; • Upgrade surface to 3 courts; • Remark surface to 3 courts; • Costs are inclusive of: o Planning and design; o Installation and undertaking of works; o External services within 3m of building; o Contingency to cover exclusions such as a requirement to upgrade switchboard for new lighting and unforeseen expenditure. **3. Dardanup Oval Club Rooms:** • Extension of approximately 94m^2 (10.4m x 9m) of standard construction and basic finishes to include new change rooms and new public toilets; • Verandahs of approximately 54m^2 (9m x 3m x 2m) with concrete floor surface; • Costs are inclusive of: o Planning and design; o Construction of building; o External services within 3m of building; o Contingency to cover exclusions such as external services beyond 3m of building and unforeseen expenditure. **4. Dardanup Oval Car Park:** • Upgrade surface and line-mark existing car parking area of approximately 20 bays; • Construct and line-mark existing informal grassed car parking

	area of approximately 70 bays; • Costs are inclusive of: o Planning and design; o Construction of car parking; o Stormwater drainage; o Minimal landscaping; o Contingency to cover exclusions such as additional sand fill for stormwater drainage purposes and unforeseen expenditure. 5. Public Library: • Extension of approximately 40m^2; • Costs are inclusive of: o Planning and design; o Construction of extension; o External services within 3m of building; o Fit-out with bookshelf units; o Contingency to cover exclusions such as external services beyond 3m of building and unforeseen expenditure. 6. Administrative costs including – • Costs to prepare and administer the plan during the period of operation inclusive of: o Legal expenses; o Valuation fees; o Proportion of staff salaries; o Computer software or hardware to administer plan; • Costs to prepare and review estimates; • Costs to prepare and review cost apportionment schedule; • Valuation costs.
Method for calculating contributions:	The DCP identifies the needs of the community infrastructure to be upgraded to cater for the future additional population as a result of the *Dardanup Townsite Expansion Strategy*. This calculation excludes – • The demand for the infrastructure generated by the existing population; • Any upgrading or works required to the infrastructure as maintenance; • Ongoing maintenance of the infrastructure; and Infrastructure items 1 and 3 to 5 are apportioned 1/3 Council, 1/3 Developer and 1/3 external funding such as grants. Infrastructure item 2 will not qualify for external funding and therefore the costs are apportioned equally between the Council and the Developer. The Developer is also liable to pay 100% of the DCP administration costs at item 6. The Developer contribution will be calculated based on their proportion of the total net DCA: (cost contribution = developer apportioned cost x developer % of total net DCA).
Priority and timing:	1. Community Centre & Outdoor Play Area.....2017/2018 2. Hard Courts at Dardanup Oval .....2017/2018 3. Dardanup Oval Club Rooms .....2020/2021 4. Dardanup Oval Car Parking .....2020/2021 5. Public Library 2020/2021
Period of operation:	10 years
Review process:	The plan will be reviewed when considered appropriate, having regard to the rate of subsequent development in the area since the last review and

	the degree of development potential still existing. **The estimated infrastructure costs in this plan will be reviewed as least annually to reflect changes in funding and revenue sources and indexed based on the Building Cost Index (as provided by Rawlinsons Australian Contribution Handbook), direct quotation or as provided by a suitably qualified person.**

H) Amend the Scheme Map and Text accordingly.

with modification for final approval by the Hon. Minister for Planning.

2. Authorise the Chief Executive Officer and Shire President to endorse and seal the amendment documentation.

CARRIED
8/0

Note: Cr. L D Harris returned to the room [4.42pm].

11.6 DEVELOPMENT SERVICES REPORTS

None.

11.7 DIRECTOR CORPORATE SERVICES REPORT

11.7.1 *Title: Monthly Statement of Financial Activity*

Reporting Department:	*Corporate Services Directorate*
Reporting Officer:	*Mrs Natalie Hopkins – Senior Financial Accounting Officer*
Legislation:	*Local Government (Financial Management) Regulations 1996*
File Number:	*FI09 0001*

Background -

Regulation 34 of the Local Government (Financial Management) Regulations 1996 requires local governments to prepare a Monthly Statement of Financial Activity.

Dardanup Development Contribution Plan - Annual Revisions/Report

FORECASTED COST AT 2025 - 2026 (Revised QS Estimates)									*original split:*		
Project	Current QS Extimate Build/Design Cost (25/26)	Build/Design Year	Forecast Design Cost	Forecast Construction Cost	Design Contingency (+ 10%)	Construction Contingency (+ 15%)	Project Total	Admin Fee (+ 4% pd by Developer)	Forecast Developer Cost (1/3 + admin)	Forecast Council Cost (1/3)	Forecast Grant Funding Required (1/3)
1. Community Centre & Play Area (Design)	$99,000	2021/22	$ 99,000	*	$ 9,900.0	*	**$ 108,900**	$ 4,356	$ 40,656	$ 36,300	*
1. Community Centre & Play Area	$1,425,000	2023/24	*	$1,425,000	$ -	$ 213,750	**$ 1,638,750**	$ 65,550	$ 611,800	$ 546,250	$ 546,250
5. Public Library Extension	$ 399,000	2021/22	$ 26,000	$373,000	$ 2,600.0	$ 55,950	**$ 457,550**	$ 18,302	$ 170,819	$ 152,517	$ 152,517
4. Rec Centre Car Park (Dardanup Oval Carparking)	$ 783,000	2027/28	$ 55,000	$728,000	$ 5,500.0	$ 109,200	**$ 897,700**	$ 35,908	$ 484,758	$ 299,233	*
2. Hard Court Upgrade	$ 1,075,000	2024/25	$ 77,000	$998,000	$ 7,700.0	$ 149,700	**$ 1,232,400**	$ 49,296	$ 460,096	$ 410,800	$ 410,800
TOTAL	$ 3,781,000		$ 257,000	$ 3,524,000	$ 25,700	$ 528,600	$ 4,335,300	$ 173,412	$ 1,768,129	$ 1,445,100	$ 1,109,567

Cost Apportionment Schedule

2025 - 26 DEVELOPER CONTRIBUTIO		
Total Net Area of DCA 1 (as per Developer Contribution Report)	95.78 Ha	
25/26 Forecast Total Developer Contribution Amount	$ 1,768,129	at 1/3 split
25/26 Developer Contribution Rate	**$18,460.31**	per net hectare

Contribution (per hectare)

Summary of Delivery of Infrastructure

Item of Infrastructure	Schedule delivery/priority in DCP	Progress Status	Expected Delivery	% detail of funding (DCP) and by other sources	Reasons for Delay
Community Centre & Outdoor Play Area	1	Not delivered	Short Term	Nil funding received for item. Provisions of DCP are based on 1/3 splits from developer, Shire and grants.	Development (subdivision) has not occurred due to utility constrains associated with water pressure and sewer infrastructure.
Hard Courts at Dardanup Oval	2	Not delivered	Short Term	Nil funding received for item. Provisions of DCP are based on 1/3 splits from developer, Shire and grants.	Development (subdivision) has not occurred due to utility constrains associated with water pressure and sewer infrastructure.
Dardanup Oval Clubrooms	3	Completed	Delivered in 2022	Full cost $1,045,082 $41,413.93 sourced from developer contributions through subdivisions $1,004,082 funded by the Shire	N/A
Dardanup Oval Car Parking	4	Partially Delivered (20 Car Parking Bays)	10 years	Nil DCP funds used Shire contributed 66,922 from reserve account to full fund the works	Development (subdivision) has not occurred due to utility constrains associated with water pressure and sewer infrastructure.
Public Library	5	Not delivered	10 years	Nil funding received for item. Provisions of DCP are based on 1/3 splits from developer, Shire and grants.	Development (subdivision has not occurred due to utility constrains associated with water pressure and sewer infrastructure.

Financial Position

	Received/value contributions collected or land area	DCP Funds expended collected	Current balance of DCF	Value of Credits	Interest earned on DCP funds (if applicable
Monetary component in levies	$41,413.93	$41,000	nil	nil	0
Works in Kind	N/A	N/A	N/A	N/A	N/A
Land contribution	N/A	N/A	N/A	N/A	N/A

(Appendix ORD: 12.2.2C)

RISK ASSESSMENT TOOL

OVERALL RISK EVENT: Annual Review of Infrastructure Costs for the Dardanup DCP

RISK THEME PROFILE:

3 - Failure to Fulfil Compliance Requirements (Statutory, Regulatory)

RISK ASSESSMENT CONTEXT: Operational

CONSEQUENCE CATEGORY	RISK EVENT	PRIOR TO TREATMENT OR CONTROL			RISK ACTION PLAN (Treatment or controls proposed)	AFTER TREATEMENT OR CONTROL		
		CONSEQUENCE	LIKELIHOOD	INHERENT RISK RATING		CONSEQUENCE	LIKELIHOOD	RESIDUAL RISK RATING
HEALTH	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
FINANCIAL IMPACT	If the review doesn't take place and the Cost Apportionment Schedule is not adjusted to reflect actual cost of delivering the infrastructure projects as per the quantity surveyor estimates, the Shire will be responsible for a greater contribution of the amount required to deliver the infrastructure.	Moderate (3).	Possible (3)	Not required.	Not required.	Not required.	Not required.	Not required.
SERVICE INTERRUPTION	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
LEGAL AND COMPLIANCE	No risk event identified for this category.	Not required	Not required	Not required	Not required.	Not required.	Not required.	Not required.
REPUTATIONAL	If Council does not undertake annual updates to the DCP in an open and transparent manner it undermines the DCP framework.	Moderate (3).	Possible (3)	Moderate (5 - 11)	Not required.	Not required.	Not required.	Not required.
ENVIRONMENT	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
PROPERTY	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required	Not required.	Not required.	Not required.

HW & Associates
ABN 62 650 513 410
Unit 5
43 Kirwan Street
FLOREAT WA 6014
Ph: (08) 9321 0102

QUANTITY SURVEYORS

25064963.002

16 April 2025

Shire of Dardanup
PO Box 7016
Eaton WA 6232

Attention: Suzanne Occhipinti

Dear Suzanne,

SHIRE OF DARDANUP – COMMUNITY INFRASTRUCTURE PROJECTS FEASIBILITY ESTIMATE

We have reviewed the scope for the proposed Community Centre and outdoor play area. Please find attached our detailed estimate, as summarised below:

Community Centre & Outdoor Play Area

Building Works	$740,000
Siteworks & Services	160,000
	$900,000
Locality Allowance for Dardanup 10%	90,000
	$990,000
Design Contingency 10%	99,000
Construction Contingency 10%	99,000
Permits, Fees & Levys	5,000
Headworks	20,000
Public Art – Excluded	-
Loose Furniture & Equipment	25,000
AV Equipment	10,000
Professional Fees 12%	150,000
Shire Management Costs 4%	56,000
Escalation for 12 months, 4.8%	70,000
Total Project Cost, excluding GST	**$1,524,000**

No cost advice has been received from the services consultants and as such we have priced these trades based upon similar projects and requirements.

We note the following qualifications:

- Demolition works have been excluded, as advised
- Carparking has been excluded, as advised
- Verandahs have been excluded entirely, as advised
- Covered links, external sheds and bin stores have been excluded
- Play equipment and sand pits have been excluded, as advised

Liam Tomlin M: 0434 611 782 E: LiamTomlin@HWAssociates.com.au
Brad Bell M: 0408 896 666 E: BradBell@HWAssociates.com.au

- Hydraulic service connections have been assumed to be available, close by and adequate – No allowance for ATU/septic system, packaged pump systems and infrastructure upgrades has been made
- CCTV, Solar PV systems and electrical infrastructure upgrades have been excluded
- A locality allowance of 10% has been included for Dardanup.
- Design and construction contingencies have been included at 10% each
- A provision for electrical and hydraulic headworks has been included at $20,000
- An allowance of $25,000 has been included for loose furniture & equipment
- An allowance of $10,000 has been included for AV equipment.
- Professional fees have been included at 12% - Subject to confirmation
- Shire management costs have been included at 4% - Subject to confirmation
- Escalation for 12 months has been allowed at 4.8% based upon current AIQS indices.
- Public art and GST have been excluded.

Whilst every effort has been made to produce an estimate that reflects fair and current market pricing, the industry is currently highly volatile. Shortages of tradesman and materials, are creating significant fluctuations and may impact subcontractor pricing.

We trust that this is adequate for your current requirements and review.

Yours faithfully

Liam Tomlin

Full Elemental Summary

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total
	BUILDING WORKS								
	Built Elements	48.56	4,352.94				740,000		740,000
	Subtotal								740,000
	SITEWORKS & SERVICES								
XP	Site Preparation	0.46	41.18				7,000		7,000
XR	Roads, Footpaths, Paved Areas	0.49	44.12				7,500		7,500
XN	Boundary Walls, Fencing, Gates	0.66	58.82				10,000		10,000
XB	Outbuildings and Covered Ways								
XL	Landscaping and Improvements	0.98	88.24				15,000		15,000
XK	External Stormwater Drainage	1.08	97.06				16,500		16,500
XD	External Sewer Drainage	1.08	97.06				16,500		16,500
XW	External Water Supply	0.72	64.71				11,000		11,000
XG	External Gas								
XF	External Fire Protection								
XE	External Electrics	3.61	323.53				55,000		55,000
PR	Preliminaries	1.41	126.47				21,500		21,500
	Subtotal								160,000
	TOTAL - Perth Based								900,000
	Locality Allowance	5.91	529.41				90,000		90,000
	TOTAL								990,000
	Design Contingency	6.50	582.35				99,000		99,000
	Construction Contingency	6.50	582.35				99,000		99,000
	Authority Costs	0.33	29.41				5,000		5,000
	Headworks & Statutory Charges	1.31	117.65				20,000		20,000
	Public Art								
	Loose Furniture & Equipment	1.64	147.06				25,000		25,000
	AV Equipment	0.66	58.82				10,000		10,000
	Professional Fees	9.84	882.35				150,000		150,000
	Management Fees	3.67	329.41				56,000		56,000
	Escalation	4.59	411.76				70,000		70,000
	GST								
	Subtotal								534,000
	TOTAL								1,524,000
	GFA: 170 m2.	**100.00**	**8,964.71**				**1,524,000**		**1,524,000**

Full Elemental Summary

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total

Final Total : $ **1,524,000**

TRADE BREAKUP

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**1 *BUILDING WORKS***						
1							
					BUILDING WORKS	**Total :**	
Trade :	**2 *Built Elements***						
	New Buildings						
1	New community centre facility including kitchen, toilets, activity area, office space, infant health clinic, etc. - Standard level of finish		170.00	m2	4,350.00		739,500.00
	Undercover Areas						
2	Attached verandahs including footings, columns, roof structure, roofing, soffit linings and ligthing - Excluded, as advised			Note			
	Sundries						
3	Rounding			Item			500.00
4	Subtotal						*740,000.00*
					Built Elements	**Total :**	**740,000.00**
Trade :	**3 *Subtotal***						
					Subtotal	**Total :**	
Trade :	**4 *SITEWORKS & SERVICES***						
1							
					SITEWORKS & SERVICES	**Total :**	
Trade :	**5 *Site Preparation***						
	Demoliton						
1	Site demolition works - Excluded, as advised			Note			
2	Demolition of existing buildings - Excluded, as advised			Note			
3	Subtotal						*0.00*
	Site Preparation						
4	Allow to clear site for building and landscaped areas, including trim and clean fill as required		350.00	m2	20.00		7,000.00
5	Subtotal						*7,000.00*

TRADE BREAKUP

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
					Site Preparation	**Total :**	**7,000.00**
Trade :	**6** ***Roads, Footpaths, Paved Areas***						
	Concrete Paving						
1	Allow for link paving to parking etc.			Item			7,500.00
2	Subtotal						*7,500.00*
3							
4	Carparking - Excluded, as advised			Note			
					Roads, Footpaths, Paved Areas	**Total :**	**7,500.00**
Trade :	**7** ***Boundary Walls, Fencing, Gates***						
	Fencing & Gates						
1	Allow for chainmesh fencing and gates		1.00	Item	10,000.00		10,000.00
2	Subtotal						*10,000.00*
					Boundary Walls, Fencing, Gates	**Total :**	**10,000.00**
Trade :	**8** ***Outbuildings and Covered Ways***						
1	Covered links - Excuded			Note			
2	External sheds - Excluded			Note			
3	Binstores - Excluded			Note			
4							
5	Attached verandah - Measured separately			Note			
					Outbuildings and Covered Ways	**Total :**	
Trade :	**9** ***Landscaping and Improvements***						
	Soft Landscaping						
1	Soft landscaping and irrigation, including turf and minimal planting		1.00	Item	15,000.00		15,000.00
2	Subtotal						*15,000.00*
3							
4	Play equipment - Excluded, as advised			Note			
5	Sand pits - Excluded, as advised			Note			
					Landscaping and Improvements	**Total :**	**15,000.00**

TRADE BREAKUP

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**10** ***External Stormwater Drainage***						
	Stormwater Drainage						
1	Stormwater drainage including collection and disposal		1.00	Item	15,000.00		15,000.00
2	Builders work and margin			Item			1,500.00
3	Subtotal						*16,500.00*
				External Stormwater Drainage		**Total :**	**16,500.00**
Trade :	**11** ***External Sewer Drainage***						
	Sewer Drainage						
1	Sewer drainage including connection to existing service and reticulation - Assume close by		1.00	Item	15,000.00		15,000.00
2	Builders work and margin			Item			1,500.00
3	Subtotal						*16,500.00*
4							
5	Hydraulic headworks - See Project Costs			Note			
6	New ATU/septic systems - Excluded			Note			
7	Packaged pump stations - Excluded			Note			
8	Significant service infrastructure upgrades - Excluded			Note			
				External Sewer Drainage		**Total :**	**16,500.00**
Trade :	**12** ***External Water Supply***						
	Water Supply						
1	Water supply including connection to existing service and reticulation - Assume close by		1.00	Item	10,000.00		10,000.00
2	Builders work and margin			Item			1,000.00
3	Subtotal						*11,000.00*
4							
5	Hydraulic headworks - See Project Costs			Note			
6	Rainwater tanks and collection - Excluded			Note			
				External Water Supply		**Total :**	**11,000.00**
Trade :	**13** ***External Gas***						
1	Gas services - Excluded			Note			

TRADE BREAKUP

Job Name : COMMUNITY CENTRE
Client's Name: Shire of Dardanup

Job Description
New Community Centre & Outdoor Play Area
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
					External Gas	**Total :**	
Trade :	**14** ***External Fire Protection***						
1	Fire services including service extension, hydrants, etc. - Excluded			Note			
					External Fire Protection	**Total :**	
Trade :	**15** ***External Electrics***						
	Electrical Services						
1	External electrical services including boards, cabling, pits, comms, external lighting, etc.		1.00	Item	50,000.00		50,000.00
2	Builders work and margin			Item			5,000.00
3	Subtotal						*55,000.00*
4							
5	Western Power/NBN headworks - See Project Costs			Note			
6	Solar PV systems - Excluded			Note			
7	Electrical infrastructure upgrades - Excluded			Note			
8	CCTV - Excluded						
					External Electrics	**Total :**	**55,000.00**
Trade :	**16** ***Preliminaries***						
1	Preliminaries 15%			Item			21,500.00
					Preliminaries	**Total :**	**21,500.00**
Trade :	**17** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**18** ***TOTAL - Perth Based***						
1							
					TOTAL - Perth Based	**Total :**	
Trade :	**19** ***Locality Allowance***						
1	Locality allowance for Dardanup 10%			Item			90,000.00

TRADE BREAKUP

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
					Locality Allowance	**Total :**	**90,000.00**
Trade :	**20** ***TOTAL***						
					TOTAL	**Total :**	
Trade :	**21** ***Design Contingency***						
1	Design contingency 10%			Item			99,000.00
					Design Contingency	**Total :**	**99,000.00**
Trade :	**22** ***Construction Contingency***						
1	Construction contingency 10%			Item			99,000.00
					Construction Contingency	**Total :**	**99,000.00**
Trade :	**23** ***Authority Costs***						
1	Permits, fees & levys			Item			5,000.00
					Authority Costs	**Total :**	**5,000.00**
Trade :	**24** ***Headworks & Statutory Charges***						
1	Elecctrical & hydraulic headworks - Provisional			Item			20,000.00
					Headworks & Statutory Charges	**Total :**	**20,000.00**
Trade :	**25** ***Public Art***						
1	Public Art 1% - Excluded			Note			
					Public Art	**Total :**	
Trade :	**26** ***Loose Furniture & Equipment***						
1	Loose furniture and equipment - Provisional			Item			25,000.00
					Loose Furniture & Equipment	**Total :**	**25,000.00**
Trade :	**27** ***AV Equipment***						
1	AV Services - Provisional			Item			10,000.00
					AV Equipment	**Total :**	**10,000.00**

TRADE BREAKUP

Job Name : COMMUNITY CENTRE

Client's Name: Shire of Dardanup

Job Description

New Community Centre & Outdoor Play Area
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**28** ***Professional Fees***						
1	Professional fees & disbursements, say 12%			Item			150,000.00
					Professional Fees	**Total :**	**150,000.00**
Trade :	**29** ***Management Fees***						
1	Shire management costs, say 4%			Item			56,000.00
					Management Fees	**Total :**	**56,000.00**
Trade :	**30** ***Escalation***						
1	Escalation for 12 months, 4.8% based upon AIQS forecast indices			Item			70,000.00
					Escalation	**Total :**	**70,000.00**
Trade :	**31** ***GST***						
1	GST has been excluded			Note			
					GST	**Total :**	
Trade :	**32** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**33** ***TOTAL***						
1							
					TOTAL	**Total :**	

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25064963.003

16 April 2025

Shire of Dardanup
PO Box 7016
Eaton WA 6232

Attention: Suzanne Occhipinti

Dear Suzanne,

SHIRE OF DARDANUP – COMMUNITY INFRASTRUCTURE PROJECTS FEASIBILITY ESTIMATE

We have reviewed the scope for the proposed Dardanup oval hardcourt upgrades. Please find attached our detailed estimate, as summarised below:

Hardcourt Upgrades

Siteworks & Services	$700,000
	$700,000
Locality Allowance for Dardanup 10%	70,000
	$770,000
Design Contingency 10%	77,000
Construction Contingency 10%	77,000
Permits, Fees & Levys	5,000
Headworks - Excluded	-
Public Art – Excluded	-
Loose Furniture & Equipment – Excluded	-
AV Equipment – Excluded	-
Professional Fees 6%	56,000
Shire Management Costs 4%	40,000
Escalation for 12 months, 4.8%	50,000
Total Project Cost, excluding GST	**$1,075,000**

No cost advice has been received from the services consultants and as such we have priced these trades based upon similar projects and requirements.

We note the following qualifications:

- Court extension works have been excluded
- Replacement of the wearing course is limited to the basketball courts – Patch and make good of tennis courts only
- Fencing works are limited to the perimeter – No allowance for internal division fencing has been made

- Covered links, external sheds and bin stores have been excluded
- An allowance for stormwater drainage has been included, however all sundry hydraulic services are excluded
- Electrical lighting upgrades are based upon the historical lighting scope provided
- A locality allowance of 10% has been included for Dardanup
- Design and construction contingencies have been included at 10% each
- Professional fees have been included at 6% - Subject to confirmation
- Shire management costs have been included at 4% - Subject to confirmation
- Escalation for 12 months has been allowed at 4.8% based upon current AIQS indices.
- Public art, loose furniture and equipment, AV equipment and GST have been excluded

Whilst every effort has been made to produce an estimate that reflects fair and current market pricing, the industry is currently highly volatile. Shortages of tradesman and materials, are creating significant fluctuations and may impact subcontractor pricing.

We trust that this is adequate for your current requirements and review.

Yours faithfully

Liam Tomlin

(Appendix ORD 12.2.2E)

Full Elemental Summary

Job Name : HARDCOURTS

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total
	BUILDING WORKS								
	Built Elements								
	Subtotal								0
	SITEWORKS & SERVICES								
XP	Site Preparation	3.98					42,825		42,825
XR	Roads, Footpaths, Paved Areas	15.14					162,800		162,800
XN	Boundary Walls, Fencing, Gates	6.36					68,340		68,340
XB	Outbuildings and Covered Ways								
XL	Landscaping and Improvements	5.58					60,000		60,000
XK	External Stormwater Drainage	7.67					82,500		82,500
XD	External Sewer Drainage								
XW	External Water Supply								
XF	External Fire Protection								
XE	External Electrics	21.49					231,000		231,000
PR	Preliminaries	4.89					52,535		52,535
	Subtotal								700,000
	TOTAL - Perth Based								700,000
	Locality Allowance	6.51					70,000		70,000
	TOTAL								770,000
	Design Contingency	7.16					77,000		77,000
	Construction Contingency	7.16					77,000		77,000
	Authority Costs	0.47					5,000		5,000
	Headworks & Statutory Charges								
	Public Art								
	Loose Furniture & Equipment								
	AV Equipment								
	Professional Fees	5.21					56,000		56,000
	Management Fees	3.72					40,000		40,000
	Escalation	4.65					50,000		50,000
	GST								
	Subtotal								305,000
	TOTAL								1,075,000
		100.00					**1,075,000**		**1,075,000**

Full Elemental Summary

Job Name : HARDCOURTS

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total

Final Total : $ **1,075,000**

TRADE BREAKUP

Job Name : HARDCOURTS

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**1 *BUILDING WORKS***						
1							
					BUILDING WORKS	**Total :**	
Trade :	**2 *Built Elements***						
1	New built elements - Excluded			Note			
					Built Elements	**Total :**	
Trade :	**3 *Subtotal***						
					Subtotal	**Total :**	
Trade :	**4 *SITEWORKS & SERVICES***						
1							
					SITEWORKS & SERVICES	**Total :**	
Trade :	**5 *Site Preparation***						
	Demolition Works						
1	Remove existing fencing to courts - Includes tennis and basketball courts		222.00	m	35.00		7,770.00
2	Remove existing basketball ring and footing		6.00	No	600.00		3,600.00
3	Remove existing tennis set and footings		2.00	No	300.00		600.00
4	Remove existing wearing surface to basketball courts, base course to remain		1,815.00	m2	15.00		27,225.00
5	Remove existing wearing surface to tennis courts - Excluded, as advised			Note			
6	Subtotal						*39,195.00*
	Siteworks						
7	Trim site and compact existing basecourse for new works		1,815.00	m2	2.00		3,630.00
8	Subtotal						*3,630.00*
9							
10	Court extension works - Excluded			Note			
11	Assume fencing to perimeter only, no allowance for internal division fence			Note			

TRADE BREAKUP

Job Name : HARDCOURTS
Client's Name: Shire of Dardanup

Job Description
Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
					Site Preparation	**Total :**	**42,825.00**
Trade :	**6** ***Roads, Footpaths, Paved Areas***						
	Asphalt Paving						
1	Supply and install new asphalt wearing course over existing basecourse		1,815.00	m2	45.00		81,675.00
2	Make good only to cracks of existing tennis courts, prepare for new surface		1,089.00	m2	5.00		5,445.00
3	Subtotal						*87,120.00*
	Sports Surface						
4	Apply 3 layered sports surface to new asphalt		2,904.00	m2	20.00		58,080.00
5	E/o for linemarking to courts		1.00	Item	6,500.00		6,500.00
6	Subtotal						*64,580.00*
	Sundries						
7	Perimeter kerbing		222.00	m	50.00		11,100.00
8	Subtotal						*11,100.00*
					Roads, Footpaths, Paved Areas	**Total :**	**162,800.00**
Trade :	**7** ***Boundary Walls, Fencing, Gates***						
	Fencing & Gates						
1	3000 high chainlink fencing and posts with PVC coated mesh		222.00	m	270.00		59,940.00
2	E/o for single gate		5.00	No	1,200.00		6,000.00
3	E/o for double gate		1.00	No	2,400.00		2,400.00
4	Subtotal						*68,340.00*
					Boundary Walls, Fencing, Gates	**Total :**	**68,340.00**
Trade :	**8** ***Outbuildings and Covered Ways***						
1	Covered links, shelters, verandahs and sheds - Excluded			Note			
					Outbuildings and Covered Ways	**Total :**	
Trade :	**9** ***Landscaping and Improvements***						
	Sports Equipment						
1	Basketball tower including footing		6.00	No	9,000.00		54,000.00

TRADE BREAKUP

Job Name : HARDCOURTS
Client's Name: Shire of Dardanup

Job Description
Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**9** ***Landscaping and Improvements***						*(Continued)*
2	Tennis net including posts, in ground sockets, net, etc.		2.00	No	3,000.00		6,000.00
3	Subtotal						*60,000.00*
	Sundries						
4	Existing bench seating and shade structures - To remain			Note			
5	Subtotal						*0.00*
				Landscaping and Improvements		**Total :**	**60,000.00**
Trade :	**10** ***External Stormwater Drainage***						
	Stormwater Drainage						
1	Allow for some stormwater drainage considerations - Provisional Sum (Strip drains)		1.00	Item	75,000.00		75,000.00
2	Builders work and margin			Item			7,500.00
3	Subtotal						*82,500.00*
				External Stormwater Drainage		**Total :**	**82,500.00**
Trade :	**11** ***External Sewer Drainage***						
1	Sewer drainage - Excluded			Note			
				External Sewer Drainage		**Total :**	
Trade :	**12** ***External Water Supply***						
1	Water supply including hosecocks - To remain as is			Note			
				External Water Supply		**Total :**	
Trade :	**13** ***External Fire Protection***						
1	Fire services - Excluded			Note			
				External Fire Protection		**Total :**	
Trade :	**14** ***External Electrics***						
	Electrical Services						
1	Electrical services including demolition of existing power reticulation, poles, lighitng, etc. - Provisional		1.00	Item	210,000.00		210,000.00
2	Builders work and margin			Item			21,000.00

TRADE BREAKUP

Job Name : HARDCOURTS

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade : **14** ***External Electrics***							*(Continued)*
3	Subtotal						*231,000.00*
					External Electrics	**Total :**	**231,000.00**
Trade : **15** ***Preliminaries***							
1	Preliminaries 8%			Item			52,535.00
					Preliminaries	**Total :**	**52,535.00**
Trade : **16** ***Subtotal***							
					Subtotal	**Total :**	
Trade : **17** ***TOTAL - Perth Based***							
1					***TOTAL - Perth Based***	**Total :**	
Trade : **18** ***Locality Allowance***							
1	Locality allowance for Dardanup 10%			Item			70,000.00
					Locality Allowance	**Total :**	**70,000.00**
Trade : **19** ***TOTAL***							
					TOTAL	**Total :**	
Trade : **20** ***Design Contingency***							
1	Design contingency 10%			Item			77,000.00
					Design Contingency	**Total :**	**77,000.00**
Trade : **21** ***Construction Contingency***							
1	Construction contingency 10%			Item			77,000.00
					Construction Contingency	**Total :**	**77,000.00**
Trade : **22** ***Authority Costs***							

TRADE BREAKUP

Job Name : HARDCOURTS

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**22** ***Authority Costs***						
1	Permits, fees & levys			Item			5,000.00
					Authority Costs	**Total :**	**5,000.00**
Trade :	**23** ***Headworks & Statutory Charges***						
1	Elecctrical & hydraulic headworks - Excluded			Note			
					Headworks & Statutory Charges	**Total :**	
Trade :	**24** ***Public Art***						
1	Public Art 1% - Excluded			Note			
					Public Art	**Total :**	
Trade :	**25** ***Loose Furniture & Equipment***						
1	Loose furniture and equipment - Excluded			Note			
					Loose Furniture & Equipment	**Total :**	
Trade :	**26** ***AV Equipment***						
1	AV Services - Excluded			Note			
					AV Equipment	**Total :**	
Trade :	**27** ***Professional Fees***						
1	Professional fees & disbursements, say 6%			Item			56,000.00
					Professional Fees	**Total :**	**56,000.00**
Trade :	**28** ***Management Fees***						
1	Shire management costs, say 4%			Item			40,000.00
					Management Fees	**Total :**	**40,000.00**
Trade :	**29** ***Escalation***						
1	Escalation for 12 months, 4.8% based upon AIQS forecast indices			Item			50,000.00
					Escalation	**Total :**	**50,000.00**

TRADE BREAKUP

Job Name : HARDCOURTS

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Hardcourt Upgrades
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade : **30** ***GST***							
1	GST has been excluded			Note			
					GST **Total :**		
Trade : **31** ***Subtotal***							
					Subtotal **Total :**		
Trade : **32** ***TOTAL***							
1							
					TOTAL **Total :**		

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25064963.004

16 April 2025

Shire of Dardanup
PO Box 7016
Eaton WA 6232

Attention: Suzanne Occhipinti

Dear Suzanne,

SHIRE OF DARDANUP – COMMUNITY INFRASTRUCTURE PROJECTS FEASIBILITY ESTIMATE

We have reviewed the scope for the proposed library extension for the Shire of Dardanup. Please find attached our detailed estimate, as summarised below:

Library Extension

Building Works	$198,000
Siteworks & Services	32,000
	$230,000
Locality Allowance for Dardanup 10%	23,000
	$253,000
Design Contingency 10%	26,000
Construction Contingency 10%	26,000
Permits, Fees & Levys	2,000
Headworks – Excluded	-
Public Art – Excluded	-
Loose Furniture & Equipment	10,000
AV Equipment – Excluded	-
Professional Fees 15%	48,000
Shire Management Costs 4%	15,000
Escalation for 12 months, 4.8%	19,000
Total Project Cost, excluding GST	**$399,000**

No cost advice has been received from the services consultants and as such we have priced these trades based upon similar projects and requirements.

We note the following qualifications:

- Verandahs have been excluded entirely, as advised
- Minor allowances for associated paving and landscape make good have been included
- No allowance has been made for water and sewer works

- CCTV, Solar PV systems and electrical infrastructure upgrades have been excluded.
- A locality allowance of 10% has been included for Dardanup.
- Design and construction contingencies have been included at 10% each
- A provisional allowance of $10,000 has been included for loose furniture and equipment
- Professional fees have been included at 15% - Subject to confirmation
- Shire management costs have been included at 4% - Subject to confirmation
- Escalation for 12 months has been allowed at 4.8% based upon current AIQS indices.
- Public art, headworks, AV equipment and GST have been excluded.

Whilst every effort has been made to produce an estimate that reflects fair and current market pricing, the industry is currently highly volatile. Shortages of tradesman and materials, are creating significant fluctuations and may impact subcontractor pricing.

We trust that this is adequate for your current requirements and review.

Yours faithfully

Liam Tomlin

Full Elemental Summary

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total
	BUILDING WORKS								
	Built Elements	49.62	4,950.00				198,000		198,000
	Subtotal								198,000
	SITEWORKS & SERVICES								
XP	Site Preparation	2.71	270.00				10,800		10,800
XR	Roads, Footpaths, Paved Areas	1.25	125.00				5,000		5,000
XN	Boundary Walls, Fencing, Gates								
XB	Outbuildings and Covered Ways								
XL	Landscaping and Improvements	0.25	25.00				1,000		1,000
XK	External Stormwater Drainage	1.24	123.75				4,950		4,950
XD	External Sewer Drainage								
XW	External Water Supply								
XG	External Gas								
XF	External Fire Protection								
XE	External Electrics	1.38	137.50				5,500		5,500
PR	Preliminaries	1.19	118.75				4,750		4,750
	Subtotal								32,000
	TOTAL - Perth Based								230,000
	Locality Allowance	5.76	575.00				23,000		23,000
	TOTAL								253,000
	Design Contingency	6.52	650.00				26,000		26,000
	Construction Contingency	6.52	650.00				26,000		26,000
	Authority Costs	0.50	50.00				2,000		2,000
	Headworks & Statutory Charges								
	Public Art								
	Loose Furniture & Equipment	2.51	250.00				10,000		10,000
	AV Equipment								
	Professional Fees	12.03	1,200.00				48,000		48,000
	Management Fees	3.76	375.00				15,000		15,000
	Escalation	4.76	475.00				19,000		19,000
	GST								
	Subtotal								146,000
	TOTAL								399,000
	GFA: 40 m2.	**100.00**	**9,975.00**				**399,000**		**399,000**

Full Elemental Summary

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total

Final Total : $ **399,000**

TRADE BREAKUP

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**1** ***BUILDING WORKS***						
1							
					BUILDING WORKS	**Total :**	
Trade :	**2** ***Built Elements***						
	Demoltion Works						
1	Demolition works to existing building to accomodate the extension works			Item			10,000.00
	New Buildings						
2	New library extension including book shelf units		40.00	m2	4,700.00		188,000.00
	Undercover Areas						
3	Attached verandahs including footings, columns, roof structure, roofing, soffit linings and lighting - Excluded, as advised			Note			
	Sundries						
4	Rounding			Item			
5	Subtotal						*188,000.00*
					Built Elements	**Total :**	**198,000.00**
Trade :	**3** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**4** ***SITEWORKS & SERVICES***						
1							
					SITEWORKS & SERVICES	**Total :**	
Trade :	**5** ***Site Preparation***						
	Demoliton						
1	Site demolition works, as required			Item			1,500.00
2	Demolition of existing buildings - Excluded			Note			
3	Subtotal						*1,500.00*
	Site Preparation						
4	Allow for services diversions - Provisional			Item			7,500.00

TRADE BREAKUP

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**5** ***Site Preparation***						*(Continued)*
5	Allow to clear site for building and landscaped areas, including trim and clean fill as required		60.00	m2	30.00		1,800.00
6	Subtotal						*9,300.00*
					Site Preparation	**Total :**	**10,800.00**
Trade :	**6** ***Roads, Footpaths, Paved Areas***						
	Concrete Paving						
1	Allow for link paving			Item			5,000.00
2	Subtotal						*5,000.00*
					Roads, Footpaths, Paved Areas	**Total :**	**5,000.00**
Trade :	**7** ***Boundary Walls, Fencing, Gates***						
	Fencing & Gates						
1	Allow for chainmesh fencing and gates - Excluded			Note			
2	Subtotal						*0.00*
					Boundary Walls, Fencing, Gates	**Total :**	
Trade :	**8** ***Outbuildings and Covered Ways***						
1	Covered links - Excuded			Note			
2	External sheds - Excluded			Note			
3	Binstores - Excluded			Note			
4							
5	Attached verandah - Measured separately			Note			
					Outbuildings and Covered Ways	**Total :**	
Trade :	**9** ***Landscaping and Improvements***						
	Soft Landscaping						
1	Landscaping make good only		1.00	Item	1,000.00		1,000.00
2	Subtotal						*1,000.00*
3							
4	New soft landscaping - Excluded			Note			
					Landscaping and Improvements	**Total :**	**1,000.00**

TRADE BREAKUP

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**10** ***External Stormwater Drainage***						
	Stormwater Drainage						
1	Stormwater drainage including collection and disposal		1.00	Item	4,500.00		4,500.00
2	Builders work and margin			Item			450.00
3	Subtotal						*4,950.00*
					External Stormwater Drainage	**Total :**	**4,950.00**
Trade :	**11** ***External Sewer Drainage***						
1	Sewer drainage - Excluded			Note			
					External Sewer Drainage	**Total :**	
Trade :	**12** ***External Water Supply***						
1	Water supply - Excluded			Note			
					External Water Supply	**Total :**	
Trade :	**13** ***External Gas***						
1	Gas services - Excluded			Note			
					External Gas	**Total :**	
Trade :	**14** ***External Fire Protection***						
1	Fire services including service extension, hydrants, etc. - Excluded			Note			
					External Fire Protection	**Total :**	
Trade :	**15** ***External Electrics***						
	Electrical Services						
1	External electrical services including boards, cabling, pits, comms, external lighting, etc.		1.00	Item	5,000.00		5,000.00
2	Builders work and margin			Item			500.00
3	Subtotal						*5,500.00*
4							
5	Western Power/NBN headworks - See Project Costs			Note			
6	Solar PV systems - Excluded			Note			
7	Electrical infrastructure upgrades - Excluded			Note			

TRADE BREAKUP

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**15** ***External Electrics***						*(Continued)*
8	CCTV - Excluded						
					External Electrics	**Total :**	**5,500.00**
Trade :	**16** ***Preliminaries***						
1	Preliminaries 15%			Item			4,750.00
					Preliminaries	**Total :**	**4,750.00**
Trade :	**17** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**18** ***TOTAL - Perth Based***						
1					***TOTAL - Perth Based***	**Total :**	
Trade :	**19** ***Locality Allowance***						
1	Locality allowance for Dardanup 10%			Item			23,000.00
					Locality Allowance	**Total :**	**23,000.00**
Trade :	**20** ***TOTAL***						
					TOTAL	**Total :**	
Trade :	**21** ***Design Contingency***						
1	Design contingency 10%			Item			26,000.00
					Design Contingency	**Total :**	**26,000.00**
Trade :	**22** ***Construction Contingency***						
1	Construction contingency 10%			Item			26,000.00
					Construction Contingency	**Total :**	**26,000.00**
Trade :	**23** ***Authority Costs***						

TRADE BREAKUP

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**23** ***Authority Costs***						
1	Permits, fees & levys			Item			2,000.00
					Authority Costs	**Total :**	**2,000.00**
Trade :	**24** ***Headworks & Statutory Charges***						
1	Elecctrical & hydraulic headworks - Excluded			Note			
					Headworks & Statutory Charges	**Total :**	
Trade :	**25** ***Public Art***						
1	Public Art 1% - Excluded			Note			
					Public Art	**Total :**	
Trade :	**26** ***Loose Furniture & Equipment***						
1	Loose furniture and equipment - Provisional			Item			10,000.00
					Loose Furniture & Equipment	**Total :**	**10,000.00**
Trade :	**27** ***AV Equipment***						
1	AV Services - Excluded			Note			
					AV Equipment	**Total :**	
Trade :	**28** ***Professional Fees***						
1	Professional fees & disbursements, say 15%			Item			48,000.00
					Professional Fees	**Total :**	**48,000.00**
Trade :	**29** ***Management Fees***						
1	Shire management costs, say 4%			Item			15,000.00
					Management Fees	**Total :**	**15,000.00**
Trade :	**30** ***Escalation***						
1	Escalation for 12 months, 4.8% based upon AIQS forecast indices			Item			19,000.00
					Escalation	**Total :**	**19,000.00**

TRADE BREAKUP

Job Name : LIBRARY EXTENSION

Client's Name: Shire of Dardanup

Job Description

Library Extension
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**31** ***GST***						
1	GST has been excluded			Note			
					GST	**Total :**	
Trade :	**32** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**33** ***TOTAL***						
1							
					TOTAL	**Total :**	

HW & Associates
ABN 62 650 513 410
Unit 5
43 Kirwan Street
FLOREAT WA 6014
Ph: (08) 9321 0102

QUANTITY SURVEYORS

25064963.005

16 April 2025

Shire of Dardanup
PO Box 7016
Eaton WA 6232

Attention: Suzanne Occhipinti

Dear Suzanne,

SHIRE OF DARDANUP – COMMUNITY INFRASTRUCTURE PROJECTS FEASIBILITY ESTIMATE

We have reviewed the scope for the proposed carpark upgrades for the Shire of Dardanup. Please find attached our detailed estimate, as summarised below:

Carpark Upgrades

Siteworks & Services	$500,000
	$500,000
Locality Allowance for Dardanup 10%	50,000
	$550,000
Design Contingency 10%	55,000
Construction Contingency 10%	55,000
Permits, Fees & Levys	4,000
Headworks – Excluded	-
Public Art – Excluded	-
Loose Furniture & Equipment – Excluded	-
AV Equipment – Excluded	-
Professional Fees 8%	54,000
Shire Management Costs 4%	29,000
Escalation for 12 months, 4.8%	36,000
Total Project Cost, excluding GST	**$783,000**

No cost advice has been received from the services consultants and as such we have priced these trades based upon similar projects and requirements.

We note the following qualifications:

- Carpark works have been priced based upon the Stage2 carparking works provided
- Hardscape elements including street furniture have been excluded
- Water supply including hose cocks have been excluded
- Pole lighting and CCTV to carparks have been excluded, as advised.
- A locality allowance of 10% has been included for Dardanup.

Liam Tomlin M: 0434 611 782 E: LiamTomlin@HWAssociates.com.au
Brad Bell M: 0408 896 666 E: BradBell@HWAssociates.com.au

- Design and construction contingencies have been included at 10% each
- Professional fees have been included at 8%, while Shire management costs have been included at 4%, both subject to confirmation.
- Escalation for 12 months has been allowed at 4.8% based upon current AIQS indices.
- Public art, headworks, loose furniture and equipment, AV equipment and GST have been excluded.

Whilst every effort has been made to produce an estimate that reflects fair and current market pricing, the industry is currently highly volatile. Shortages of tradesman and materials, are creating significant fluctuations and may impact subcontractor pricing.

We trust that this is adequate for your current requirements and review.

Yours faithfully

Liam Tomlin

Full Elemental Summary

Job Name : CARPARK

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Carpark
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total
	BUILDING WORKS								
	Built Elements								
	Subtotal								0
	SITEWORKS & SERVICES								
XP	Site Preparation	8.75					68,500		68,500
XR	Roads, Footpaths, Paved Areas	32.49					254,370		254,370
XN	Boundary Walls, Fencing, Gates	0.51					4,000		4,000
XB	Outbuildings and Covered Ways								
XL	Landscaping and Improvements	2.29					17,916		17,916
XK	External Stormwater Drainage	12.99					101,750		101,750
XD	External Sewer Drainage	1.00					7,800		7,800
XW	External Water Supply								
XF	External Fire Protection								
XE	External Electrics								
PR	Preliminaries	5.83					45,664		45,664
	Subtotal								500,000
	TOTAL - Perth Based								500,000
	Locality Allowance	6.39					50,000		50,000
	TOTAL								550,000
	Design Contingency	7.02					55,000		55,000
	Construction Contingency	7.02					55,000		55,000
	Authority Costs	0.51					4,000		4,000
	Headworks & Statutory Charges								
	Public Art								
	Loose Furniture & Equipment								
	AV Equipment								
	Professional Fees	6.90					54,000		54,000
	Management Fees	3.70					29,000		29,000
	Escalation	4.60					36,000		36,000
	GST								
	Subtotal								233,000
	TOTAL								783,000
		100.00					**783,000**		**783,000**

Full Elemental Summary

Job Name : CARPARK

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Carpark
Shire of Dardanup

Elem. Code	Elemental Description	% B.C.	Cost/m2	Elem. Qty	Elem. Unit	Elem. Rate	Sub Total	Mark Up %	Elemental Total

Final Total : $ **783,000**

TRADE BREAKUP

Job Name : CARPARK **Job Description**

Client's Name: Shire of Dardanup

Dardanup Oval Carpark
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**1 *BUILDING WORKS***						
1							
					BUILDING WORKS	**Total :**	
Trade :	**2 *Built Elements***						
1	New built elements - Excluded			Note			
					Built Elements	**Total :**	
Trade :	**3 *Subtotal***						
					Subtotal	**Total :**	
Trade :	**4 *SITEWORKS & SERVICES***						
1							
					SITEWORKS & SERVICES	**Total :**	
Trade :	**5 *Site Preparation***						
	Demolition Works						
1	Remove existing wearing surface to carpark & roadway, box out exisitn gvegetaiton		2,100.00	m2	25.00		52,500.00
2	Sundry demolition of built elements			Item			5,500.00
3	Subtotal						*58,000.00*
	Siteworks						
4	Trim site and form levels for new works		2,100.00	m2	5.00		10,500.00
5	Subtotal						*10,500.00*
					Site Preparation	**Total :**	**68,500.00**
Trade :	**6 *Roads, Footpaths, Paved Areas***						
	Carparking						
1	Bitumen roadway, including base and sub base		1,700.00	m2	85.00		144,500.00
2	E/o for crossover		1.00	No	7,500.00		7,500.00
3	6500 wide speed hump		1.00	No	25,000.00		25,000.00
4	Concrete kerbing		200.00	m	65.00		13,000.00

TRADE BREAKUP

Job Name : CARPARK **Job Description**

Client's Name: Shire of Dardanup

Dardanup Oval Carpark
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**6** ***Roads, Footpaths, Paved Areas***						*(Continued)*
5	Allow for pram ramps			Item			7,500.00
6	Allow for linemarking			Item			5,000.00
7	Allow for bollards and signage			Item			5,000.00
8	Allow for wheelstops		28.00	No	250.00		7,000.00
9	Subtotal						*214,500.00*
	Paving						
10	Concrete pedestrian paving - Where indicated		175.00	m2	150.00		26,250.00
11	Masonry paving and bedding - Where indicated		66.00	m2	90.00		5,940.00
12	Subtotal						*32,190.00*
	Sundries						
13	Pine bollards		46.00	No	150.00		6,900.00
14	Limestone gravel access track		26.00	m2	30.00		780.00
15	Subtotal						*7,680.00*
				Roads, Footpaths, Paved Areas		**Total :**	**254,370.00**
Trade :	**7** ***Boundary Walls, Fencing, Gates***						
	Access Gate						
1	Chain and post access gate to limestone track		2.00	No	2,000.00		4,000.00
2	Subtotal						*4,000.00*
				Boundary Walls, Fencing, Gates		**Total :**	**4,000.00**
Trade :	**8** ***Outbuildings and Covered Ways***						
1	Covered links, shelters, verandahs and sheds - Excluded			Note			
				Outbuildings and Covered Ways		**Total :**	
Trade :	**9** ***Landscaping and Improvements***						
	Soft Landscaping						
1	Soft landscaping and irrigation, including make good works		1.00	Item	17,916.00		17,916.00
2	Subtotal						*17,916.00*
3							

TRADE BREAKUP

Job Name : CARPARK **Job Description**

Client's Name: Shire of Dardanup

Dardanup Oval Carpark
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**9 *Landscaping and Improvements***						*(Continued)*
4	Hardscape elements including street furniture - Excluded			Note			
					Landscaping and Improvements	**Total :**	**17,916.00**
Trade :	**10 *External Stormwater Drainage***						
	Civil Stormwater Drainage - Based upon design provided						
1	Civil stormwater drainage including pipework, sumps, side entry pits, headwalls, etc.		1.00	Item	80,000.00		80,000.00
2	Allow to form open swales		1.00	Item	12,500.00		12,500.00
3	Builders work and margin			Item			9,250.00
4	Subtotal						*101,750.00*
					External Stormwater Drainage	**Total :**	**101,750.00**
Trade :	**11 *External Sewer Drainage***						
	PVC Conduits						
1	PVC conduits to accomodate future works		78.00	m	100.00		7,800.00
2	Subtotal						*7,800.00*
					External Sewer Drainage	**Total :**	**7,800.00**
Trade :	**12 *External Water Supply***						
1	Water supply including hosecosks - Excluded			Note			
					External Water Supply	**Total :**	
Trade :	**13 *External Fire Protection***						
1	Fire services - Excluded			Note			
					External Fire Protection	**Total :**	
Trade :	**14 *External Electrics***						
1	Pole lighting to carparks - Excluded, as advised			Note			
2	CCTV to carparks - Excluded, as advised			Note			
					External Electrics	**Total :**	
Trade :	**15 *Preliminaries***						

TRADE BREAKUP

Job Name : CARPARK

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Carpark
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
Trade :	**15** ***Preliminaries***						
	Preliminaries						
1	Preliminaries 10%			Item			45,664.00
2	Subtotal						*45,664.00*
					Preliminaries	**Total :**	**45,664.00**
Trade :	**16** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**17** ***TOTAL - Perth Based***						
1							
					TOTAL - Perth Based	**Total :**	
Trade :	**18** ***Locality Allowance***						
1	Locality allowance for Dardanup 10%			Item			50,000.00
					Locality Allowance	**Total :**	**50,000.00**
Trade :	**19** ***TOTAL***						
					TOTAL	**Total :**	
Trade :	**20** ***Design Contingency***						
1	Design contingency 10%			Item			55,000.00
					Design Contingency	**Total :**	**55,000.00**
Trade :	**21** ***Construction Contingency***						
1	Construction contingency 10%			Item			55,000.00
					Construction Contingency	**Total :**	**55,000.00**
Trade :	**22** ***Authority Costs***						
1	Permits, fees & levys			Item			4,000.00

TRADE BREAKUP

Job Name : CARPARK **Job Description**

Client's Name: Shire of Dardanup

Dardanup Oval Carpark
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
					Authority Costs	**Total :**	**4,000.00**
Trade :	**23** ***Headworks & Statutory Charges***						
1	Headworks - Excluded			Note			
					Headworks & Statutory Charges	**Total :**	
Trade :	**24** ***Public Art***						
1	Public Art 1% - Excluded			Note			
					Public Art	**Total :**	
Trade :	**25** ***Loose Furniture & Equipment***						
1	Loose furniture and equipment - Excluded			Note			
					Loose Furniture & Equipment	**Total :**	
Trade :	**26** ***AV Equipment***						
1	AV Services - Excluded			Note			
					AV Equipment	**Total :**	
Trade :	**27** ***Professional Fees***						
1	Professional fees & disbursements, say 8%			Item			54,000.00
					Professional Fees	**Total :**	**54,000.00**
Trade :	**28** ***Management Fees***						
1	Shire management costs, say 4%			Item			29,000.00
					Management Fees	**Total :**	**29,000.00**
Trade :	**29** ***Escalation***						
1	Escalation for 12 months, 4.8% based upon AIQS forecast indices			Item			36,000.00
					Escalation	**Total :**	**36,000.00**
Trade :	**30** ***GST***						
1	GST has been excluded			Note			

TRADE BREAKUP

Job Name : CARPARK

Client's Name: Shire of Dardanup

Job Description

Dardanup Oval Carpark
Shire of Dardanup

Item No.	Item Description	+/- %	Quantity	Unit	Rate	Mark Up %	Amount
					GST	**Total :**	
Trade :	**31** ***Subtotal***						
					Subtotal	**Total :**	
Trade :	**32** ***TOTAL***						
1							
					TOTAL	**Total :**	

Taylor Burrell Barnett

t: (08) 9226 4276
e: admin@tbbplanning.com.au

taylorburrellbarnett.com.au

Our Ref: 17/079a

28 February 2025

Attention: Ashwin Nair

Shire of Dardanup
1 Council Drive
Eaton WA 6232

Dear Ashwin

AMENDMENT TO GARDEN OF EATON LOCAL STRUCTURE PLAN – AGREED STRUCTURE PLAN 27 (ASP 27) – SOUTHBANK@EATON

Taylor Burrell Barnett, on behalf of our client Ardross Estates (S.A) Pty Ltd, is pleased to lodge with the Shire of Dardanup an amendment to the approved Garden of Eaton Local Structure Plan (LSP) – Agreed Structure Plan 27 (ASP 27) for the Shire's consideration and determination. As part of this proposal please find attached the following documentation:

- **Attachment A** – LSP Amendment Plan (TBB Plan No. 17/079/024A);
- **Attachment B** – Proposed 'Stage 1' Plan of Subdivision (WAPC Ref. 201093) (TBB Plan No. 17/079/022);
- **Attachment C** – Proposed 'Stage 2' Plan of Subdivision (TBB Plan No. 17/079/023);
- **Attachment D** – Preliminary Landscape Concept Plan for the POS & Drainage Area prepared by LD Total;
- **Attachment E** – Millbridge Estate Public Open Space (POS) Schedule;
- **Attachment F** – Transport Impact Assessment (TIA) prepared by Transcore (dated July 2024)
- **Attachment G** – Local Water Management Strategy (LWMS) prepared by hyd20 (dated February 2025);
- **Attachment H** – Bushfire Management Plan (BMP) prepared by Emerge Associates (dated October 2024); and
- **Attachment I** – Needs Assessment prepared by Pracsys (dated January 2022).

Payment of the prescribed application fee will be made payable by our client upon notification and the subsequent provision of an invoice by the Shire.

To assist the Shire and Western Australian Planning Commission (WAPC) in its consideration of the application, the following supporting information is provided.

Subject Site

The proposed modifications to the LSP relates to a discrete parcel of land approximately 18 hectares (ha) in area and commonly referred to as Southbank@eaton ("Southbank"). Southbank, together with East Millbridge

(located east of Eaton Drive) forms part of the wider ASP 27 and Milbridge Private Estate by Ardross Group of Companies.

The land the subject of this LSP Amendment is legally described as Lot 3001 Eaton Drive, Millbridge (the 'subject site').

The subject site is located within the Shire of Dardanup, approximately 9 kilometres (km) north-east of Bunbury and approximately 150km south of Perth. The subject site is bounded by Eaton Drive to the south-east, Collie River to the north and mostly cleared undeveloped land to the west which is identified for future residential development as part of the Parkridge Estate.

The subject site has historically been used for stock grazing, however is presently largely cleared with sparse vegetation within the north-west and north-eastern corners associated with the Kalgulup Regional Park and the Collie River foreshore. The topography of the subject site grades from the south at 12m AHD to the north at 3m AHD sloping towards the Collie River.

Background

Garden of Eaton Local Structure Plan (Agreed Structure Plan 27 - ASP 27)

As required under Clause 3.15.7.3(a) of the Shire of Dardanup Town Planning Scheme No. 3 (TPS 3), a structure plan is required prior to Council recommending subdivision or approving the development of land within the 'Development' zone.

The Garden of Eaton Local Structure Plan (ASP 27) (as amended) was approved by the Shire at its Ordinary Council Meeting of 2 July 2014 adopted by the Western Australian Planning Commission (WAPC) on 29 July 2014 to guide the development of Millbridge Private Estate. ASP 27 relates to areas described as Southbank@eaton ("Southbank") and East Millbridge.

The subject site forms part of the Southbank@eaton (Southbank) portion of ASP 27 and is identified as 'Residential' with residential density codes of R20, R30 and R100, 'Recreation' and additional uses (A1 and A2). The additional uses for both sites as provided under ASP 27 are stated as follows:

- *Short stay residential*
- *Up to 500m^2 NLA floorspace may be used for commercial purposes, including and limited to restaurants, eating houses, offices, professional offices and/or shops. Shops shall not occupy more than 200m^2 NLA of the 500m^2 NLA (maximum) commercial floor area.*

Acknowledging that the approval period of ASP 27 is to 18 October 2025, an application to extend the approval of the LSP will be submitted to the WAPC (with Shire recommendation) through the Form 5D application process.

Pre-Lodgement Consultation

Our Office discussed the proposed modifications to the LSP and supporting subdivision concept plan with the Shire of Dardanup technical officers (Planning and Engineering) on multiple occasions commencing in March 2024 and most recently on 18 June 2024. The purpose of the meetings was to present the land use and development intent of the proposed subdivision redesign for the subject site and discuss a strategy as to how to progress subdivision and development of the subject site under the approved ASP 27.

It was acknowledged by all that a discrete area of the plan, being the land abutting the Collie River foreshore to the south, identified as 'Residential', with a residential density code of R100 and additional uses (A1 and A2) under the ASP 27, represented a minor misalignment with the purpose for which the land is intended under the approved ASP 27.

To this end, the purpose of this request, is to propose modifications to the 'Southbank' portion of ASP 27, seeking to apply a residential density code of R15 and to remove the additional use(s) over the site to facilitate the lot product and dwelling type as envisaged for the subject site.

In addition to the modifications deemed necessary to accommodate the proposed subdivision the area hereon referred to as 'Stage 2', the balance of ASP 27 'Southbank' (referred to as 'Stage 1') has been modified to apply a more contemporary approach to the LSP, which removes the detailed lot layout and internal local access streets and applies a blanket 'Residential' land use designation and residential density coding to facilitate a diversity of lot product and dwelling types in line with current market demand, including areas of open space.

Manner and Form

Consistent with our discussions with Shire officers, the form of the LSP Amendment application is consistent with past amendments to ASP 27 and comprises the following:

- Cover letter that outlines the key changes to the LSP as it relates to Southbank@eaton.
- A description of any key changes required to the original ASP 27 Report (current Planning Framework, Proposed Land Uses and Residential Density, Movement Network, Land Budget (POS Schedule)).
- Any necessary technical assessments provided as addendums to existing approved reports or standalone reports.

The presentation style of the LSP map for Southbank@eaton will be in a form consistent with the Planning and Development (Local Planning Schemes) Regulations 2015 Structure Plan Framework outlining:

- Land use zones
- Reservations (public open spaces and regional open space)
- Residential density codes
- Public open space
- Movement network (major road network including main access streets and pedestrian pathways)

The presentation style of the LSP map (refer **Attachment A**) for East Millbridge (east of Eaton Drive) will remain consistent with the form of the approved LSP given the development of East Millbridge is nearing completion.

Proposed 'Stage 1' Subdivision Application (WAPC Ref. 201093)

A subdivision application for 'Stage 1' (WAPC Ref. 201093) was lodged on 28 November 2024 and is currently under assessment by the Shire and WAPC independently of this LSP Amendment request and concurrent proposed subdivision application for 'Stage 2' as discussed below.

The 'Stage 1' subdivision application proposes the subdivision of 101 residential lots, ranging in size from 505m^2 to 1,004m2; with an average lot size of 682m^2, one grouped-housing site and two areas of open space (refer **Attachment B**).

The 'Stage 1' subdivision area is identified as 'Residential' with residential density codes of R20 and R30 and 'Recreation' under the approved ASP 27 and proposed minor departures from the lot and road layout of the approved LSP. However, as discussed above, the subdivision design across the majority of the subject site ('Stage 1') was considered by the Shire to be generally in alignment with the approved layout and does not fundamentally alter the original purpose and intent of ASP 27.

Proposed Concurrent 'Stage 2' Subdivision Application

As discussed above, concurrent with this Amendment to ASP 27, a subdivision application for 'Stage 2' will be lodged with the WAPC proposing the subdivision of 18 single residential lots ranging in size from 765m^2 to 1,268m^2; with an average lot size of 910m^2 (refer **Attachment C**). The proposed lot sizes are in accordance with the R15 density code proposed under the concurrent ASP 27 Modification.

Planning Framework

Greater Bunbury Region Scheme

The subject site is predominately zoned 'Urban' under the Greater Bunbury Region Scheme (GBRS). The northern portion of the subject site is reserved as 'Regional Open Space' consistent with the extent of the foreshore reservation under the approved Millars Creek Foreshore Management Plan 2017 and as proposed under the LSP Amendment.

Shire of Dardanup Town Planning Scheme No. 3

Under the Shire of Dardanup Town Planning Scheme No. 3 (TPS 3) the majority of the subject site is zoned 'Development'. Consistent with the GBRS, the northern portion of the subject site is reserved as 'Regional Open Space' with a strip of land to the south of the GBRS reservation, identified as a Local Scheme Reservation ('Recreation') aligning with the overall extent of the foreshore reservation.

The zoning/reservation of the subject site under the Shire's Draft Local Planning Scheme No. 9 (LPS 9) is consistent with that under the Shire's existing TPS 3. The objective of the 'Development' zone is *"to provide for the orderly and proper of large areas of land through a comprehensive Structure Plan which is able to respond to changing circumstances through the development stages of the area."*

It is understood that Draft LPS 9 is awaiting final consideration by the Minister for Planning. The proposed Amendment to ASP 27 is consistent with Draft LPS 9 and will ensure that future land use and development within "Southbank" can be controlled and guided by LPS 9.

Surrounding Structure Planning

Land to the immediate west of the subject site is subject to the Parkridge Estate Local Structure Plan which was originally adopted by the Shire in December 1991 and endorsed by the WAPC. The LSP area will accommodate low and medium density residential development and POS.

An Amendment to the LSP was lodged in May 2023 proposing the removal of POS and reconfiguration of residential cells. This Amendment was refused by the WAPC's Statutory Planning Committee (SPC) and a modified Amendment proposal expected to be lodged with the State Administrative Tribunal (SAT) in late February 2025.

Ardross Group has been in close contact with the planning consultant of Parkridge Estate (Harley Dykstra) to discuss the proposals and integration between both LSP areas. Harley Dykstra has indicated a willingness to work with Ardross Group to achieve an integrated outcome and to ensure an alignment between both plans, particularly to ensure a coordinated and functional movement network is achieved.

Proposed Amendment

The proposed Amendment to ASP 27 will modify the subdivision and land use / density layout for the Southbank. A design review was undertaken by Ardross Group and the consultant team largely informed by market feedback over recent years from MillBridge Estate and surrounding estates that the plan in its current form is no longer appropriate. It is also considered necessary to undertake the review as the current design is several years old and market trends have changed with lot product type and mix requiring review.

Furthermore, the viability of non-residential development has diminished generally and following the establishment of significant retail and non-retail offerings both to the north and south of the subject site at Eaton Fair and Treendale since the LSP was originally approved.

In addition to this, as the development of Millbridge East (east of Eaton Drive) nears completion, it was timely and appropriate for Southbank to be progressed and a natural progression of the development front east of Eaton Drive.

General description of modifications undertaken to the LSP, include:

- revised road layout;
- re-distribution of residential densities;
- refinement of POS distribution and location; and
- removal of additional uses (A1 and A2) that provide for short-stay residential and other commercial uses/floorspace.

The design review process has incorporated inputs from the following disciplines:

- town planning;
- urban design;
- engineering;
- landscaping;
- bushfire;
- hydrology; and
- traffic.

Redesign Rationale

There are a number of fundamental design principles that have guided the revised design of the subject site. Importantly, the main principles in which the currently approved LSP are based are maintained, including the protection of the Kalgulup Regional Park / Collie River foreshore and surrounding environs.

The modified subdivision layout as proposed under the respective subdivision applications, depicts an urban environment focused achieving more regular-shaped lots and promoting liveability and walkability through a more efficient and legible movement network of streets and paths. The road layout provides a strong grid arrangement based on key north to south links connecting residents to the foreshore area and broader pedestrian and cyclist connections along the river foreshore.

The fundamental design principles which have guided the Amendment to ASP 27 as it relates to “Southbank” are summarised below.

- Optimise exposure, and north-south connectivity, to the foreshore (the subject site’s most prominent natural asset).
- Optimise north-south connectivity to, the foreshore.
- Create strong physical and visual connections from distributor roads of Eaton Drive.
- Create green links and slow-speed environments through wider ‘boulevard’ style roads.
- Provide a centralised area for informal passive recreation opportunities as an extension to the foreshore and promote amenity for residents and visitors.
- Integration with the surrounding areas and providing a seamless fit with the broader estate context east Eaton Drive (Millbridge East).
- Optimise connectivity and integration between the subject site and neighbouring Parkridge Estate.
- Achieve more regular-shaped lots and a more efficient and legible movement network through a modified road and lot layout.

Proposed Land Uses and Residential Density

Land Uses

The proposed amendment seeks to identify the subject site predominately 'Residential' in addition to portions of land identified as 'Regional Open Space' and 'Public Open Space' (regional and local reserves respectively) (refer **Attachment A**).

Based on the likely timing and unfolding of development for subject site, the land uses designations proposed on the ASP map have been determined based on the zones and reservations proposed under the Shire's Draft LPS 9.

Residential

The proposed amendment seeks to designate the majority of the subject site 'Residential' with residential density codes of R15, R20 and R40. The accompanying proposed plan(s) of subdivision achieves an indicative yield of 120 lots. The area of land identified as 'Residential – R40' is capable of being developed as a grouped-dwelling site with an indicative yield of 21 dwellings. Under the existing ASP 27, the indicative subdivision layout achieves an approximate yield of 142 lots and a residential density of R20 and R30 across the majority of the LSP area (excluding R100 sites).

Lot Product Mix and Residential Density

The lot product will largely accommodate traditional front-loaded product with a mix of lot frontage of 17m, 18m, 20m and 22m which provides traditional and affordable front-loaded product that can accommodate a wide range of project home builder designs. The proposed lot typology mix is consistent with the remainder of the lot product within the Millbridge Private Estate (Millbridge East).

The area proposed as 'Residential – R15' will facilitate deeper lots, ranging between 40-60m, as a response to bushfire protection where abutting the Kalgulup Regional Park / Collie River foreshore. A residential density of R15 will accommodate larger homes located adjacent areas of high amenity and will also provide the opportunity for outdoor living areas that achieve appropriate surveillance and activation of the public realm.

It is acknowledged that the proposed Amendment seeks to allocate a residential density of R20 over the majority of the subject site and an indicative dwelling yield of 120 dwellings, which is a decrease from the existing LSP. However, the proposed subdivision layout and associated residential densities is considered to be more in keeping with current market demand, and acknowledging the passage of time (over 10 years) since the original LSP was prepared.

The residential density codes proposed under this Amendment will facilitate the subdivision and development of the lot product mix proposed under the respective subdivision applications.

Removal of Additional Uses A1 & A2

The existing ASP 27 identifies two sites abutting the Collie River foreshore envisaged to accommodate 'mixed use' forms of development. The ASP 27 report states that a total of 1200m^2 of commercial floorspace and 50-60 residential dwellings based on a residential density code of R100 is envisaged for the sites. Potential for short-stay residential was also identified.

The proposed Amendment to ASP 27 seeks to remove the 'additional uses' of short stay residential and commercial floorspace provision and designate the sites as 'Residential' with a residential density code of R15.

The development of non-residential land uses within this area is heavily dependent on the condition of the market at the time of development. The proposed 'Residential' land use designation over this area of land would not preclude non-residential uses from occurring on the site where capable of approved under the 'Residential' zone of the Shire's TPS 3 / Draft LPS 9, however acknowledging the current health and predicted maturation of

centres within Millbridge and the surrounding area, residential use of the site would be regarded as more appropriate, and higher and better use for the site and would not have the potential to sterilise development of the site for years to come.

The underlying land use designation (zoning) of the land is not proposed to change under this LSP Amendment, only the removal of the ability to apply the 'additional use'. Land use permissibility is limited to those uses permitted under the 'Residential' zone of the Shire's existing TPS 3 (and ultimately Draft LPS 9). Development of the site is to be in keeping with the objectives for the residential zone and consistent with the intent of the underlying 'Residential' zone of the approved ASP 27, whilst being cognisant of contextual considerations.

Public Open Space

As a result of the redesign process which focused on producing a more efficient subdivision layout, the configuration of the POS required review to respond to the modified lot/road layout and to accommodate stormwater drainage requirements and respond to bushfire management considerations.

The subject site includes two areas of open space – 'Kalgulup Regional Park' identified as 'Regional Open Space' on the proposed LSP Map and a centralised area of POS as a continuation of the Collie River Foreshore / Kalgulup Regional Park' identified as 'Public Open Space' on the LSP Map.

- **'Regional Open Space' (Kalgulup Regional Park)'** measures 5.1375 ha in area and will comprise the foreshore reservation for the protection of the Collie River and environs. This open space area will enhance the amenity of the foreshore and provide for good pedestrian/cyclist connectivity along the foreshore and beyond. The vegetation and landscaping within the Kalgulup Regional Park area will be retained in its current condition consistent with the foreshore reservation east of Eaton Drive. The location of the Regional Open Space as proposed is consistent with the area of land as reserved under the GBRS, TPS 3, Draft LPS 9 and approved ASP 27 and Millars Creek Foreshore Management Plan 2017.
- **'Public Open Space'** measures 1.1883 ha in area and will offer informal passive recreation opportunities. A preliminary landscape concept plan has been prepared by LD Total and is provided at **Attachment D** for information purposes only. The indicative concept plan provides an illustration of the intent for the public realm design, providing a balanced outcome with respect to usable POS, bushfire considerations, drainage requirements and promoting amenity for residents and visitors. This POS area will also perform a drainage function consistent with the recently approved LWMS (2024). The location and layout of this POS area represents a minor departure from the approved ASP 27.

The proposed LSP Amendment results in a total of 17.31 ha, 13.88 ha of which is unrestricted. Based on the methodology for calculation as established through the approved ASP 27, the proposed Amendment to ASP 27 results in a total POS provision of 10.1% across the ASP 27 area and exceeds the WAPC's POS requirement (refer **Attachment E**).

The proposed LSP Map reflects the minor changes to the redistribution of POS, and importantly, maintains the original intent of the approved LSP to provide for informal passive recreational opportunities, respond to drainage requirements, retain existing vegetation and provide for high-quality managed landscaping. The proposed POS effectively consolidates all POS into one area which provides for a more useable space of varying functions.

As documented in the recently approved Local Water Management Strategy (LWMS) (2024), two existing groundwater licences (GWL 109152, GWL 171479) provide more than sufficient water for POS irrigation within the subject site.

Movement Network

A comprehensive TIA has been prepared by Transcore in support of the Amendment to ASP 27 and related subdivision applications and is provided at **Appendix F**. The TIA details the estimated traffic that would be generated by the LSP area and proposed subdivision applications, the resultant traffic patterns and a review of the capacity of the road infrastructure proposed to accommodate the anticipated traffic flows.

Key elements of the movement network are listed below. Consistent with the WAPC's Guidance for Structure Plans, the proposed LSP Map identifies 'main access streets' only with lower order roads identified and confirmed through more detailed subdivision planning.

- Eaton Drive - an existing road reserve which will provide vehicle access to the subject site. The subject site will be connected to Eaton Drive via a priority-controlled T-intersection. The existing seagull island within Eaton Drive, which will facilitate the future intersection at this location.
- Main access streets – Access Street Type C roads which will provide the key connections to the adjacent Parkridge Estate development and primary north-south connections. These roads will provide for a 'boulevard-style' treatment with a 18m road reserve intended to accommodate additional street tree planting with the detailed design of the roads as 'slow-speed' environments.
- All other roads within the subject are identified as 'Access Street Type D' capable of supporting less than 1,000 vehicles per day (vpd). A reservation width of 15.0m is proposed for these local roads.

In direct response to matters raised by the Shire at various pre-lodgement meetings, the TIA addresses how the proposed subdivision will integrate with the proposed movement network of the neighbouring Parkridge Estate as identified on the approved Parkridge Estate Structure Plan.

The road reserve widths along the connection points would facilitate the integration of the movement networks between the two LSP areas. As indicated on Figure 2 of the TIA, the continuation of the 6m carriageway roads identified on the endorsed Parkridge LSP road network confirms there is sufficient space within the road reserve to accommodate 4.2 - 4.5m verges on both sides of the roads, allowing for a harmonious transition between the two estates.

It should also be acknowledged that in light of the SPC's decision on the previous LSP Amendment for Parkridge Estate, a modified Amendment proposal is being pursued by Parkridge Estate through SAT. The location and alignment of connections points and road reserve widths between the two estates as proposed under the modified proposal has respected the proposed movement network under ASP 27 by Ardross Group and will facilitate the integration of the movement networks.

Whilst the modified Amendment proposal for Parkridge Estate is subject to review by SAT and does not currently have any formal status, the movement network proposed under ASP 27 is capable of achieving a functional movement network with the Parkridge Estate LSP as approved. Notwithstanding, there is a level of comfort that Parkridge Estate has undertaken to align their road network with that of the proposed Amendment to ASP 27 accordingly.

Road and Service Infrastructure

Existing service infrastructure is located within the surrounding road network which will be extended to the subject site providing all lots with the necessary services. Drainage will be constructed in accordance with the recently approved Local Water Management Strategy (LWMS) as discussed in more detail below.

Drainage

A LWMS has been prepared by Hyd2o in support of this Amendment to the LSP and based on the modified subdivision layout (refer **Attachment G**). The hydrological considerations underpinning the original Structure Plan (2010, amended 2014) have required a review and updated assessment of the pre-development environment and stormwater and groundwater strategy to inform the proposed Structure Plan/subdivision design.

Key design criteria as outlined in the LWMS is as follows:

- Provide 1% AEP storage areas within the site for attenuation of local stormwater to allowable predevelopment rates.
- Provide flood paths for overland flows within the development area which exceed the capacity of piped drainage.
- Attenuation of local stormwater (20% AEP) to allowable predevelopment rates.
- 15mm event to be retained /treated on site.
- Bioretention areas to provide water quality treatment for small event runoff.
- Establishment of storage invert levels no lower than seasonal maximum groundwater levels to prevent nutrient export.

The LWMS was submitted to Department of Water and Environmental Regulation (DWER) and the Shire of Dardanup for assessment in November 2024. Various discussions with both DWER and the Shire's engineers were had pre-lodgement. Based on this initial consultation, the principles and drainage regime of the LWMS were considered reasonable.

Comments were received from the agencies in December 2024 and a modified LWMS was resubmitted and final approval to the LWMS was granted by DWER on 13 February 2025.

It is anticipated that a condition of subdivision requiring the preparation and approval of an Urban Water Management Plan (UWMP) will be required which will include refinement of stormwater modelling, preparation of more detailed landscape plans (species selection and treatments), and detailed engineering design drawings.

Bushfire Management

The subject site is identified as a designated bushfire prone area under the Department of Fire and Emergency Services (DEFS) Map of Bushfire Prone Areas. A Bushfire Management Plan (BMP) has been prepared by Emerge Associates in accordance with State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) and the associated Guidelines to identify any potential risks to future development (refer **Attachment H**).

The results of the Bushfire Attack Level (BAL) assessment within this BMP are summarised below:

- All new habitable buildings are capable of achieving BAL-29 or less, with the majority of lots the subject of this application subject to BAL-LOW.
- Lots located along the western boundary of the subject site are capable of achieving a BAL-29 or less through the requirement for an Asset Protection Zone (APZ) ranging in width from 9.0m to 17.0m. This management interface is required as a result of vegetation within the adjacent development (Parkridge Estate). As the timing of development within this landholding is unknown, this area is considered a temporary hazard.
- A 9.0m wide strip of POS managed to low threat standards will ensure a BAL-29 or less can be achieved for lots directly abutting Kalgulup Regional Park). This management interface will likely include a dual-use footpath and managed POS (in the form of mulch or turf).
- Future subdivision/development of land identified as 'Residential – R40' within the southern portion of the subject site is capable of achieving a BAL-29 or less through the requirement for an APZ measuring

21.0m in width along the western boundary. This management interface is required on the assumption that the POS proposed within the adjacent development (Parkridge Estate) will be unmanaged.

Due to the staging of development within Parkridge Estate to the west of the subject site, it is possible that only a single access is provided to Eaton Drive in the short-term. If required, a temporary emergency access way can be provided from the site to Eaton Drive until development to the west has progressed and road connections are available. Two possible locations have been identified in the BMP and a specific location will be confirmed in consultation with the Shire of Dardanup.

The results of the BAL assessment within this BMP show that all future dwellings within the amendment area can achieve appropriate separation from bushfire hazards to ensure a BAL rating of BAL-29 is not exceeded. The results of the BAL assessment will be re-assessed and certified as part of future subdivision and/or building licenses as required.

Retail Needs Assessment

Pracsys was engaged in January 2022 to prepare a Needs Assessment to consider whether there is sufficient demand for the planned retail and non-retail uses for MillBridge Estate (ASP 27 area) (refer **Attachment I**). The purpose of the assessment was to examine the supply and demand for retail floorspace within the surrounding catchment based on supply and demand using gravity modelling and market share assessment to determine if there would be sufficient demand for retail to warrant the additional supply of floorspace.

Pracsys also examined the viability of non-retail floorspace considering relevant commercial considerations and the Six Principles of Activation. On the balance of these considerations and principles, the assessment determined that both the Southbank and East Millbridge portions of ASP 27 would likely experience high levels of vacancy if the sites identified for non-residential uses were developed.

This has been evident for the two development sites located within the East Millbridge portion of the Estate, designated as 'Mixed Business' under ASP 27 which have both remained vacant and undeveloped. Lot 15 located at the corner of Clayton View and Millbridge Boulevard is earmarked as a future child care centre and a development application for the site is being progressed. However, neighbouring Lot 14 is undeveloped and interest for mixed use residential and commercial development has struggled with feasibility. As such, the intended use and desired outcome for Lot 14 is for single residential development.

The report concluded that even when all residential developments within the respective catchment areas were completed, there was inadequate demand to support the additional floorspace, due to the established activity centre hierarchy providing sufficient supply to meet the demand, particularly with the planned Eaton Fair expansion.

Based on this advice, as discussed above, the LSP Amendment proposes to remove the 'additional uses' A1 and A2 and apply a land use designation of 'Residential – R15' for this portion of the subject site. This proposal has been informed by the advice provided by Pracsys and being mindful of the current health and predicted maturation of centres within Millbridge and the surrounding area, particularly the future planned expansion of Eaton as a District Centre and establishment of Treendale.

High density mixed use development has not adequately responded to the current and future market demand, which has led to a limited uptake of development and underutilised land. Single residential development is considered as an appropriate use for this zone and locality and provide housing stock that responds to the current and future housing demand of the area and in a form that is more sustainable to the market and demographic of the area.

Conclusion

We trust the information included within this request for a modification to the approved Revised Garden of Eaton LSP (ASP 27) for Southbank@eaton is satisfactory. We respectfully request the Shire's support and the WAPC's adoption in accordance with the LPS Regulations.

Should you require any further information or clarification, please do not hesitate to contact the undersigned or Samantha Thompson from our Office.

Yours faithfully
TAYLOR BURRELL BARNETT

KATHERINE SHIRLEY
SENIOR ASSOCIATE

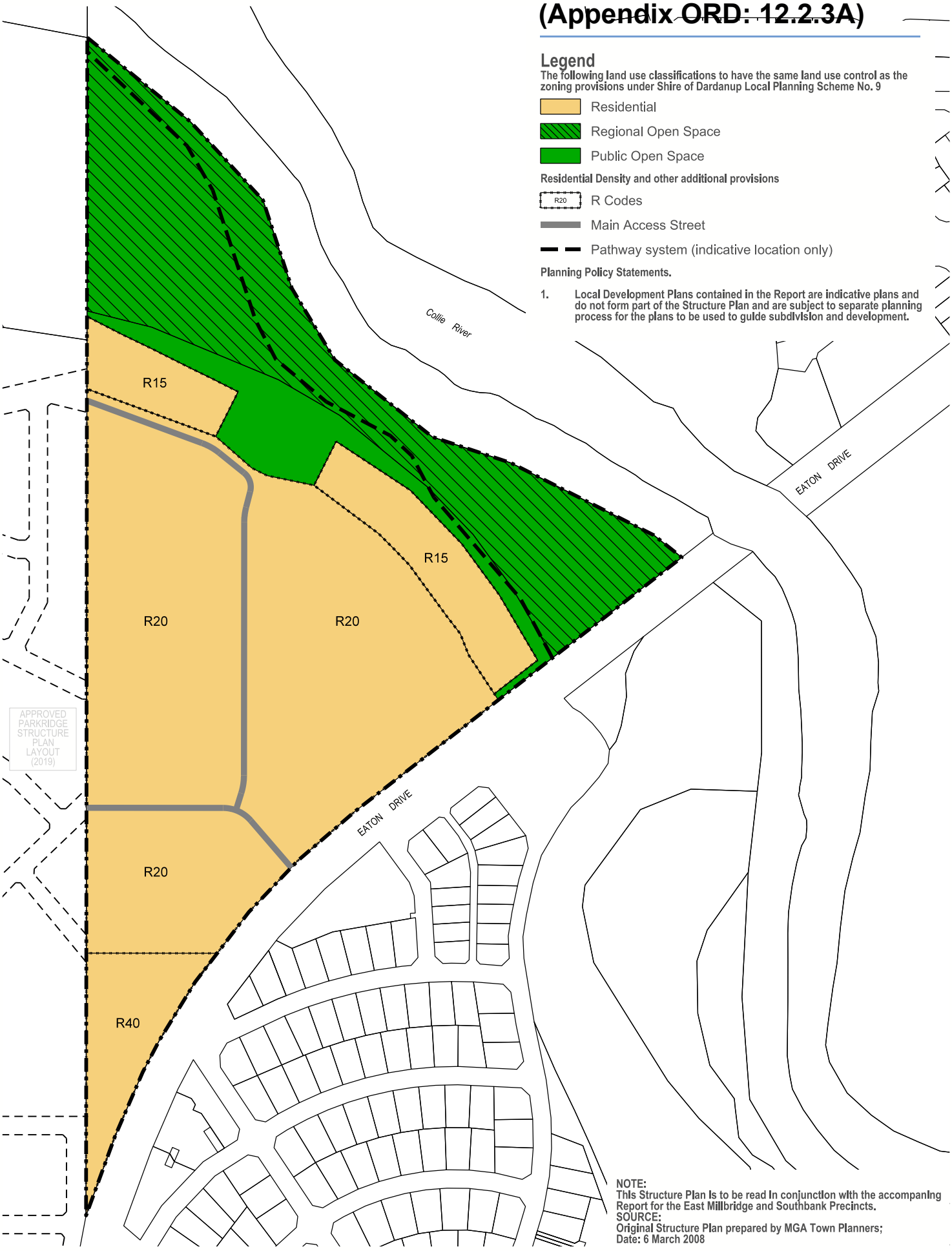
CC: Daniel Skerratt – Ardross Estates

(Appendix ORD: 12.2.3A)

Attachment A

LSP Amendment Map
(TBB Plan No. 17/079/024A)

(Appendix ~~ORD: 12.2.3A~~)



GARDEN OF EATON AGREED STRUCTURE PLAN 27 MODIFICATION

SOUTHBANK@eaton,
MILLBRIDGE

0 40 80m

scale: 1:4000@A4

plan: 17/079/024A

date: 26/02/2025

Taylor Burrell Barnett Town Planning & Design
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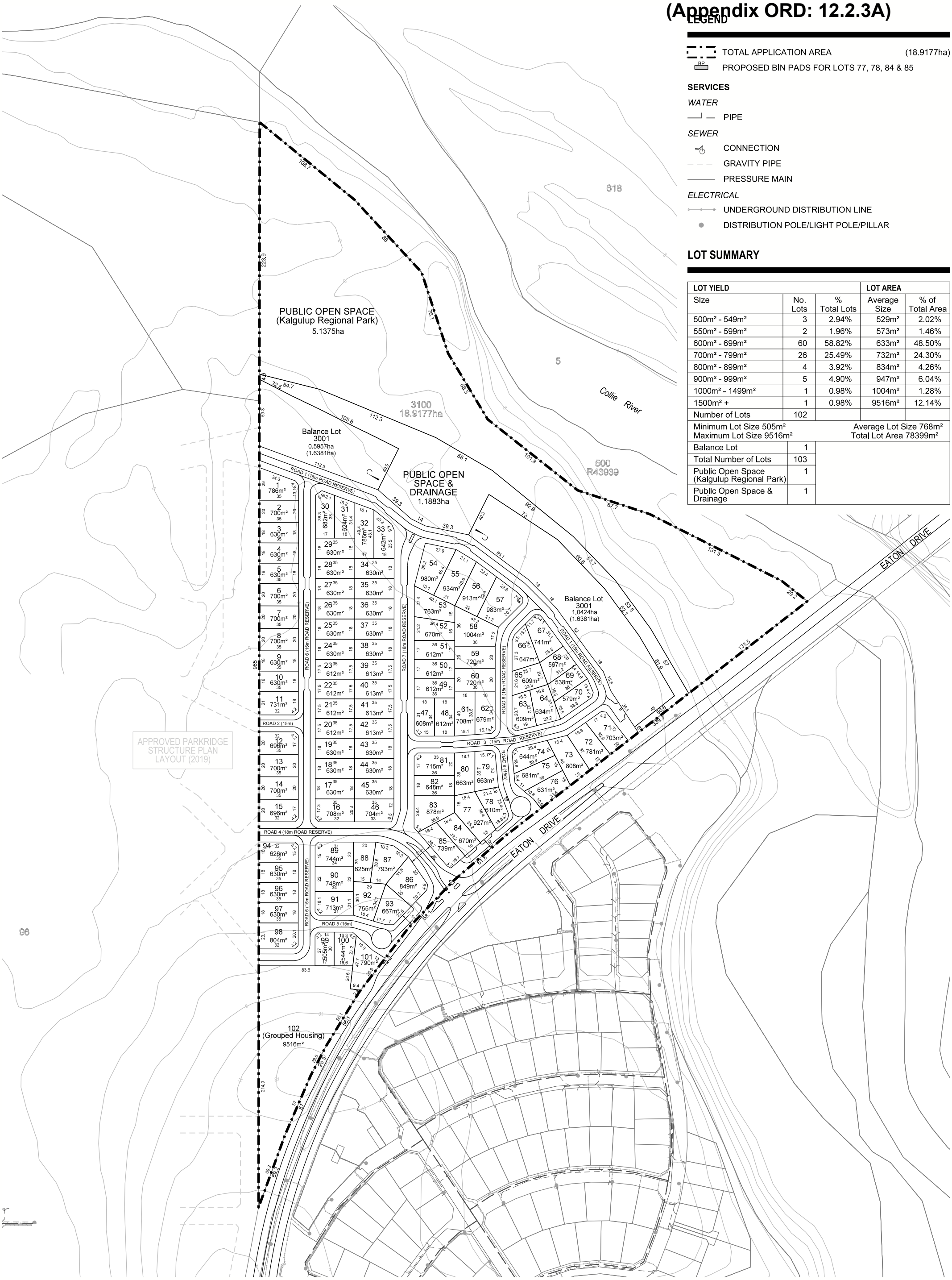
Taylor Burrell Barnett

(Appendix ORD: 12.2.3A)

Attachment B

Proposed 'Stage 1' Plan of Subdivision
(WAPC Ref. 201093)
(TBB Plan No. 17/079/022)

(Appendix ORD: 12.2.3A)



LEGEND

TOTAL APPLICATION AREA (18.9177ha)

BP PROPOSED BIN PADS FOR LOTS 77, 78, 84 & 85

SERVICES

WATER

PIPE

SEWER

CONNECTION

GRAVITY PIPE

PRESSURE MAIN

ELECTRICAL

UNDERGROUND DISTRIBUTION LINE

DISTRIBUTION POLE/LIGHT POLE/PILLAR

LOT SUMMARY

LOT YIELD			LOT AREA	
Size	No. Lots	% Total Lots	Average Size	% of Total Area
500m² - 549m²	3	2.94%	529m²	2.02%
550m² - 599m²	2	1.96%	573m²	1.46%
600m² - 699m²	60	58.82%	633m²	48.50%
700m² - 799m²	26	25.49%	732m²	24.30%
800m² - 899m²	4	3.92%	834m²	4.26%
900m² - 999m²	5	4.90%	947m²	6.04%
1000m² - 1499m²	1	0.98%	1004m²	1.28%
1500m² +	1	0.98%	9516m²	12.14%
Number of Lots	102			
Minimum Lot Size 505m² Maximum Lot Size 9516m²			Average Lot Size 768m² Total Lot Area 78399m²	

Balance Lot	1
Total Number of Lots	103
Public Open Space (Kalgulup Regional Park)	1
Public Open Space & Drainage	1

Plan of Subdivision - Stage 1 (Freehold)

LOT 3001 EATON DRIVE, EATON

An Ardross Estates Project

plan: 17/079/022 | date: 08/10/2024 | designed: KS

scale: 1:3000@A3 | 1:1500@A1 | grid: PCG 94 | checked: -

0 30 60m | aerial: - | drawn: JB

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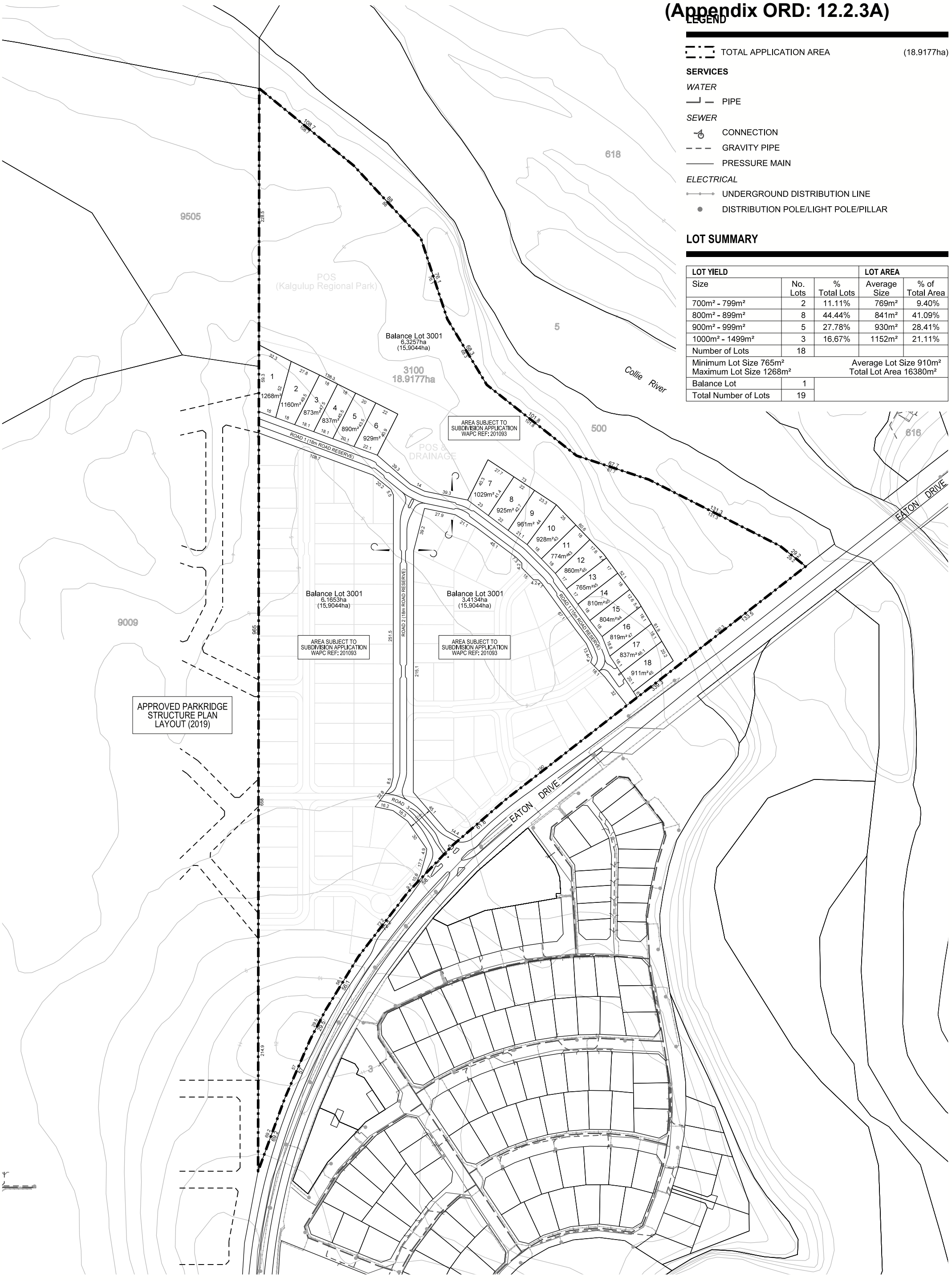
(Appendix ORD: 12.2.3A)

Attachment C

Proposed 'Stage 2' Plan of Subdivision
(TBB Plan No. 17/079/023)

(Appendix ORD: 12.2.3A)



Plan of Subdivision - Stage 2 (Freehold)

LOT 3001 EATON DRIVE, EATON

An Ardross Estates Project

DRAFT

plan: 17/079/023
date: 28/11/2024
designed: KS
scale: 1:3000@A3 | 1:1500@A1
grid: PCG 94
checked: -
0 30 60m
aerial: -
drawn: JB

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(Appendix ORD: 12.2.3A)

Attachment D

Preliminary Landscape Concept Plan

Millbridge Southbank POS

Lot 3001 Eaton Drive, Eaton

Indicative concept for discussion purposes only

Legend

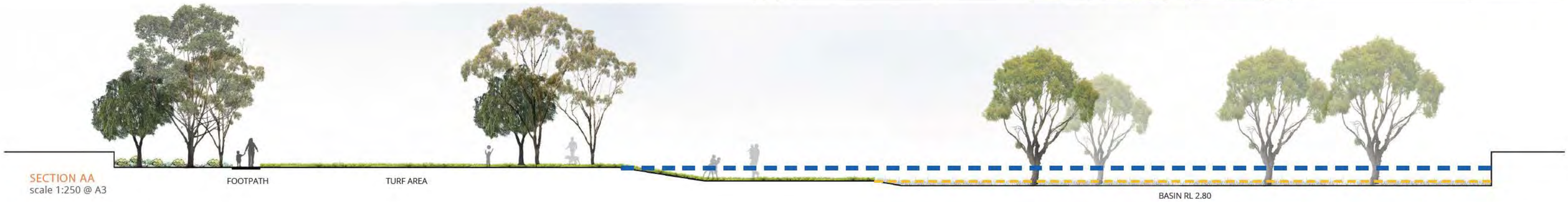
1. Sheltered picnic setting
2. Universally accessible paths to foreshore
3. Turf area
4. Planted drainage basin
5. Garden planting with native species
6. Rock pitching to culverts

Drainage Basin
Base level @ RL 2.80

TWL 4.00 (Top of Bund)

TWL 3.10

PLAN
scale 1:500 @ A3



SECTION AA
scale 1:250 @ A3

LD TOTAL

ARDROSS ESTATES	B	07.06.2024	1 OF 1
CLIENT	REVISION	DATE	PAGE

NOTE: Design is subject to detailed design, budget allocation and approval with LGA. POS design subject to water allocation and detailed design to meet LPP requirements.

(Appendix ORD: 12.2.3A)

Attachment E

Public Open Space Schedule

PUBLIC OPEN SPACE SCHEDULE MILLBRIDGE ESTATE Garden of Eaton and Southbank@eaton LSPs (Agreed Structure Plan 27 January 2010) 16 December 2024		
Gross Site Area (ha)		**212.1529**
Deductions		
District Distributor Roads (Eaton Dr)	4.3849	
Foreshore and Recreation reserves in floodway	24.1562	
Drainage Reserves (1:1 Drainage)	0.2711	
Recreation and Drainage Reserves 1:1 Drainage Area only	2.1319	
Public Purpose Reserves - earth bund	1.4117	
Public Purpose Reserves - emergency access	0.0721	
School Site	3.5002	
Child Care Site	0.3685	
Surplus Restricted POS	3.8977	
Total Deductions	**40.1943**	
Gross Subdivisible Area		171.9586
Required Public Open Space (10%)		17.1959
Public Open Space Requirements		
Unrestricted public open space – minimum 80%	13.7567	
Restricted public open space – maximum 20%	3.4392	
Total Required		17.1959
PUBLIC OPEN SPACE PROVISION		
Unrestricted Public Open Space		
Formalised POS	13.8752	
Total Unrestricted Public Open Space		13.8752
Restricted Public Open Space		
Restricted POS (1:5)	3.4392	
Total Restricted Public Open Space	**3.4392**	
Total Credited Restricted Public Open Space		**3.4392**
Total Credited Public Open Space		**17.3144**
Percentage of Public Open Space Provided (Unrestricted and Restricted POS Contribution)		**10.1%**
Public Open Space overprovision		**0.1185**

Notes:

1. All areas are in hectares

2. Land areas as per Landgate, 'Reserve Creation Plan' prepared by Thompson Surveying Consultants (Drawing No: DWG16344, dated 24/11/2015), WAPC 161095 Approved Plan of Subdivision, Lot 3001 ("Southbank") Proposed Plan of Subdivision (TBB Plan No. 17/079/022).

3. Drainage calculations as per Millbridge Private Estate Stages 16-22 UWMP, March 2014 and Lot 3001 LWMS (Drawing No. 7903-SB-SK003 Rev B - thecivilgroup 01 Oct 24)

4. POS Provision calculated across Garden of Eaton LSP, including Southbank@eaton LSP (Agreed Structure Plan 27 January 2010)

(Appendix ORD: 12.2.3A)

Attachment F

Transport Impact Assessment

Engineering a better future for over 20 years!

Lot 3001 Eaton Drive, Eaton

Proposed Subdivision

Transport Impact Assessment

PREPARED FOR:
Ardross Eatates (S.A.) Pty Ltd

July 2024

Document history and status

Author	Revision	Approved by	Date approved	Revision type
Mohammad Rasouli	r01	Behnam Bordbar	20/07/2024	Draft
Mohammad Rasouli	r01a	Behnam Bordbar	23/07/2024	Final

File name: t24.176.mr.r01a.docx

Author: Mohammad Rasouli

Project manager: Mohammad Rasouli

Client: Ardross Estate (S.A.) Pty Ltd

Project: Lot 3001 Eaton Drive, Eaton

Document revision: r01a

Project number: t24.176

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1 Summary

This Traffic Impact Assessment (TIA) has been prepared by Transcore on behalf of Ardross Estates (S.A.) Pty Ltd for the proposed subdivision at Lot 3001 Eaton Drive, known as Southbank, located in the Shire of Dardanup.

The plan of subdivision consists of 120 Lots including one grouped housing site, and the analysis considers the full development of both Southbank and the adjacent Parkridge Estate.

The proposed hierarchy of roads within the subdivision area is generally in line with the original approved Structure Plan, and the alignment of road reserve widths between Southbank and Parkridge Estates would facilitate the integration of the movement networks between the two developments.

The proposed subdivision is expected to generate 1,120 trips per day or 112 vehicles per hour. The existing layout of Eaton Drive, including a large median and seagull island, has been modelled in SIDRA and is found to operate satisfactorily during the 2038 peak hours, though it is recommended that the final intersection layout be reviewed and refined during detailed design.

2 Introduction and Background

This Traffic Impact Assessment (TIA) has been prepared by Transcore on behalf of Ardross Estates (S.A.) Pty Ltd for the proposed subdivision at Lot 3001 Eaton Drive, known as Southbank, located in the Shire of Dardanup.

The Southbank forms the northwestern corner of the Garden of Eaton Local Structure Plan (LSP), which was endorsed in July 2014. The Garden of Eaton LSP is situated in the suburbs of Millbridge and Eaton within the Greater Bunbury region. The endorsed LSP is provided in **Appendix A**.

Immediately adjacent to the west of Southbank development is the Parkridge Estate.The original structure plan for Parkridge Estate was approved in 2019. Since then, the development of 71 lots located on the southern end of the Parkridge structure plan has been completed. The approved Parkridge Estate Structure Plan is included in **Appendix B**. However, a recent amendment to the Parkridge Estate Structure Plan, proposed in 2023, was refused by the DPLH's Statutory Planning Committee in April 2024. The amended Parkridge Estate Structure Plan is included in **Appendix C**.

The proposed Southbank is located in Eaton, Shire of Dardanup. It is located approximately 9km northeast of Bunbury, and about 150km south of Perth.The location of the Southbank and Parkridge Estate is illustrated in **Figure 1**. The traffic modelling and analysis undertaken in this TIA considers the full development of both Estates and the potential traffic interaction between them.

For the purpose of this TIA the following documents were sourced and reviewed:

- Southbank at Eaton East Millbridge Amended Structure Plan, MGA town planners 2015;
- Parkridge SP, Calibre Professional Services Pty Ltd, September 2019;
- Eaton Drive Access Review, Riley Consulting, April 2018; and,
- Parkridge SP Modifications TIA, Stantec, March 2023.

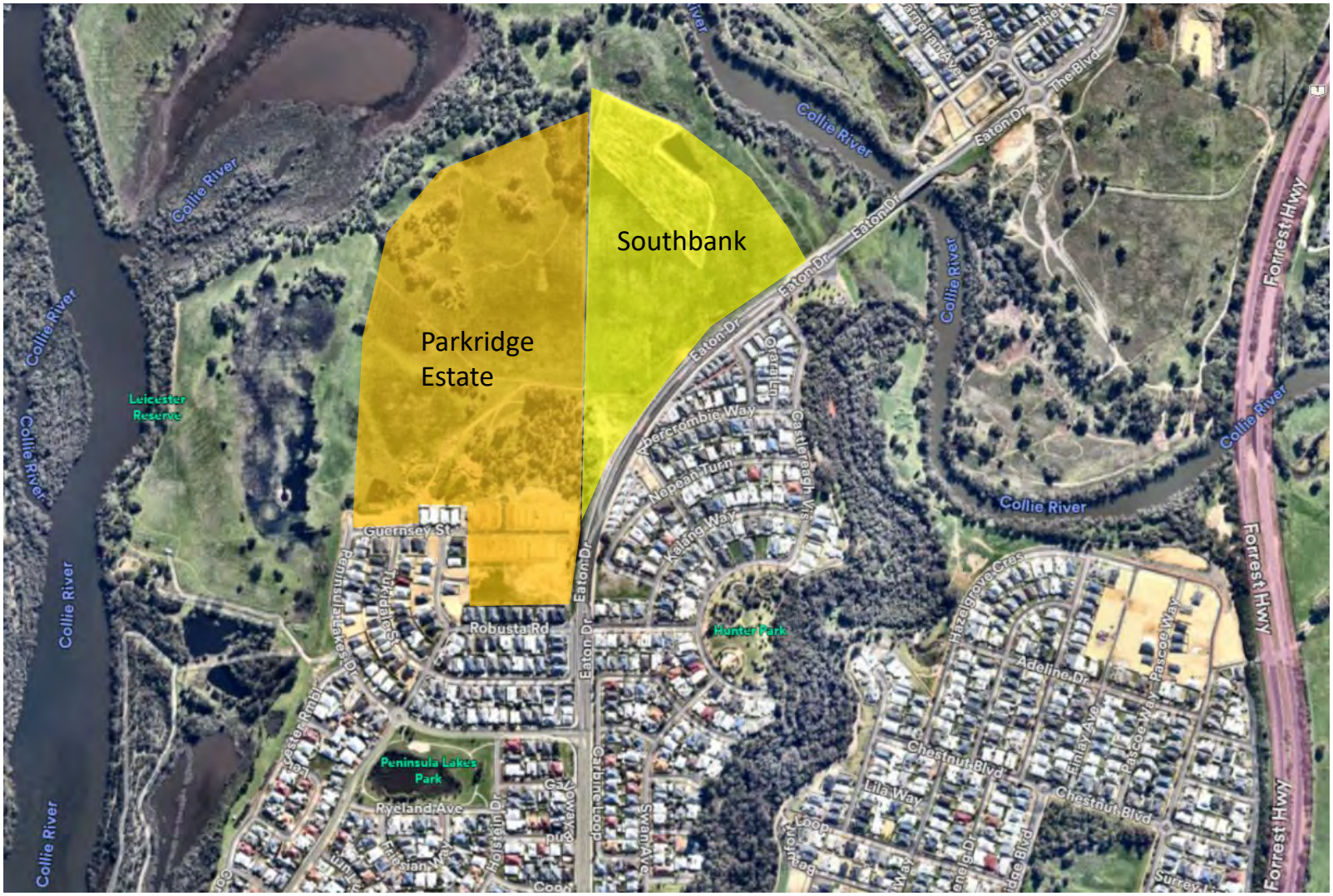

Figure 1: Location of the Southbank and Parkridge Estate

3 Proposed Subdivision

The proposed plan of subdivision is shown in **Appendix D**. The plan of subdivision consists of 120 Lots (including a grouped housing) plus one Lot for Kalgulup Regional Park.

For the proposed grouped housing lot, based on the current R20 zoning and average lot size of 450 m^2, the theoretical maximum yield is 21 grouped dwellings. However, this site will likely be retained as a 'balance of title' lot in the upcoming subdivision. Given the constrained nature of the site, the actual yield will likely be significantly less than this theoretical maximum.

The proposed subdivision plan has been prepared to respond to the current demands for choice in housing style combined with the physical attributes of the land and its connection to the neighbouring Parkridge Estate. It has been acknowledged and accepted by the applicant and Shire that the proposed subdivision is not in complete alignment with the approved Millbridge Estate Structure Plan (as a due regard document). Despite this, the road hierarchy and connection points to the adjacent Parkridge Estate are in line with the approved Millbridge Structure Plan.

The plan of subdivision shows the location and alignment of the connection points between the Southbank and Parkridge Estate. It is essential that the movement network of the proposed subdivision concept plan integrates seamlessly with the endorsed Parkridge Structure Plan (SP).

A review of the road reserve widths along the connection points reveals that the proposed subdivision has used a similar road reserve width as the endorsed Parkridge SP. This alignment of the road reserve widths between the two developments would facilitate the integration of the movement networks.

Figure 2 indicates the continuation of the 6-metre carriageway roads suggested in the subdivision concept plan through the endorsed Parkridge SP road network. This visual representation demonstrates that there is sufficient space within the road reserve to accommodate 4.2 - 4.5-metre verges on both sides of the roads, allowing for a harmonious transition between the two estates.

The details of the road cross-sections and their final alignment would need to be investigated further as part of the subdivision plan for the Parkridge Estate. It is our understanding that both the Southbank and Parkridge Estate would be willing to work together to achieve this integrated outcome. The proposed subdivision will be connected to Eaton Drive via a priority-controlled T-intersection, as shown in the proposed subdivision plan (Road 4/Eaton Drive intersection). Currently, a seagull island is provided on Eaton Drive, which will facilitate the future intersection at this location.

The appropriate layout of the intersection on the western side of Eaton Drive (at Road 4) will need to be investigated and finalised during the detailed design stage of the development.

Figure 2: Proposed amended Local Structure Plan

4 Existing Situation

4.1 Existing Land Use

Currently, there is an ongoing subdivision development in southern part of the subject site which is progressing towards north.

4.2 Existing Road Network

The existing road network and its classification in the Main Roads WA functional road hierarchy is illustrated in **Figure 3**.

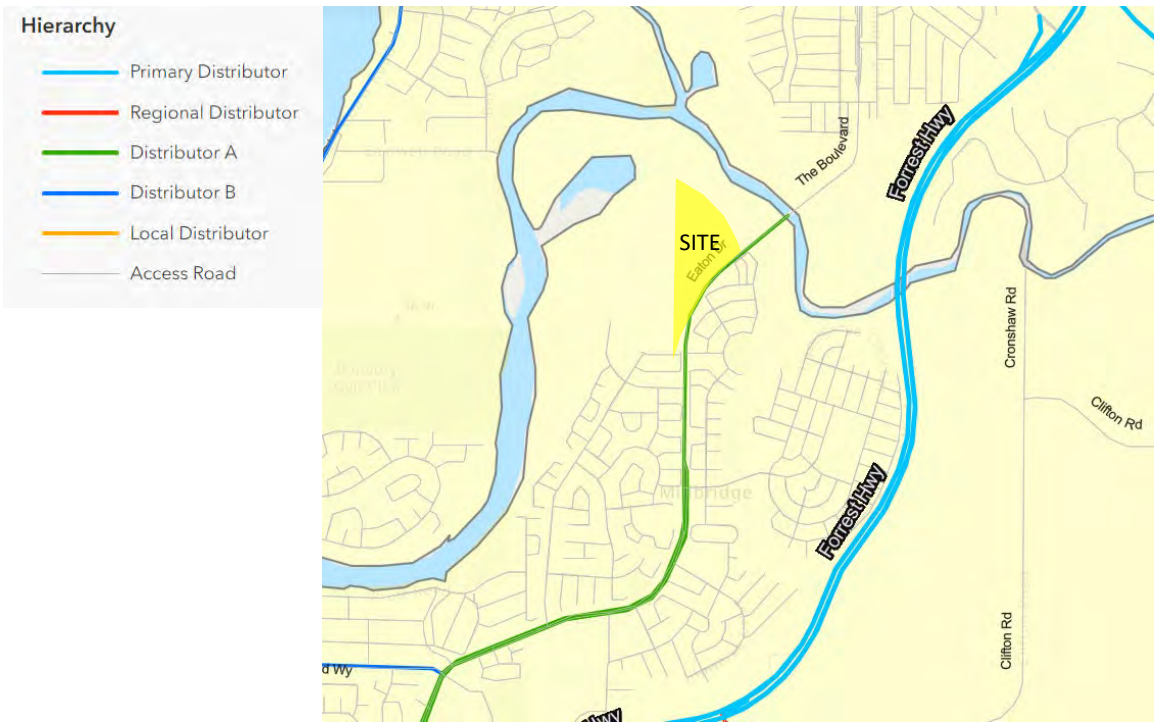

Figure 3: Existing road hierarchy

Eaton Drive is classified as a Distributor A road, which connects the suburbs of Eaton and Millbridge to Forrest Highway and the city of Bunbury.

Between Forrest Highway and the subject site, Eaton Drive is constructed as a four-lane divided carriageway. North of the subject site, Eaton Drive transitions to a single lane in each direction. The existing posted speed limit on surrounding roads are shown in **Figure 4**.

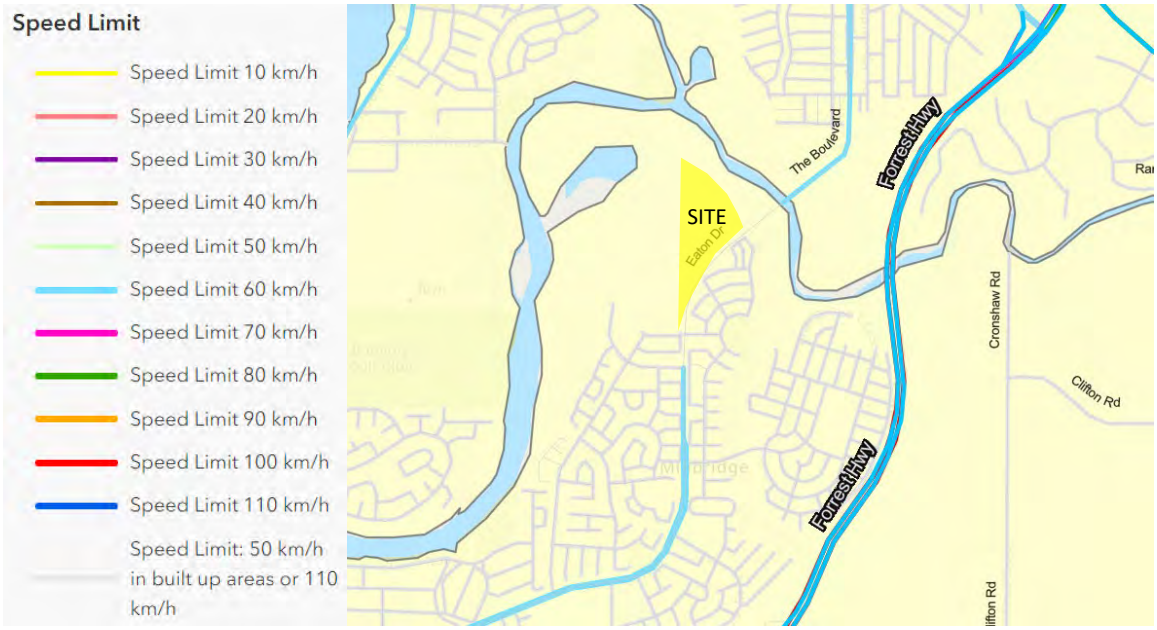

Figure 4: Existing posted speed limits

4.3 Existing Traffic Volumes

Existing average weekday traffic (AWT) volumes on surrounding roads have been obtained from Main Roads WA and are illustrated in Figure 5.

Figure 5: Existing traffic volumes

The existing turning counts at the intersection of Peninsula Drive/ Eaton Drive were also sourced from Main Roads WA traffic map (dated Thursday 9th June 2022). Figure 6 illustrates the existing peak hour traffic counts at the intersection.

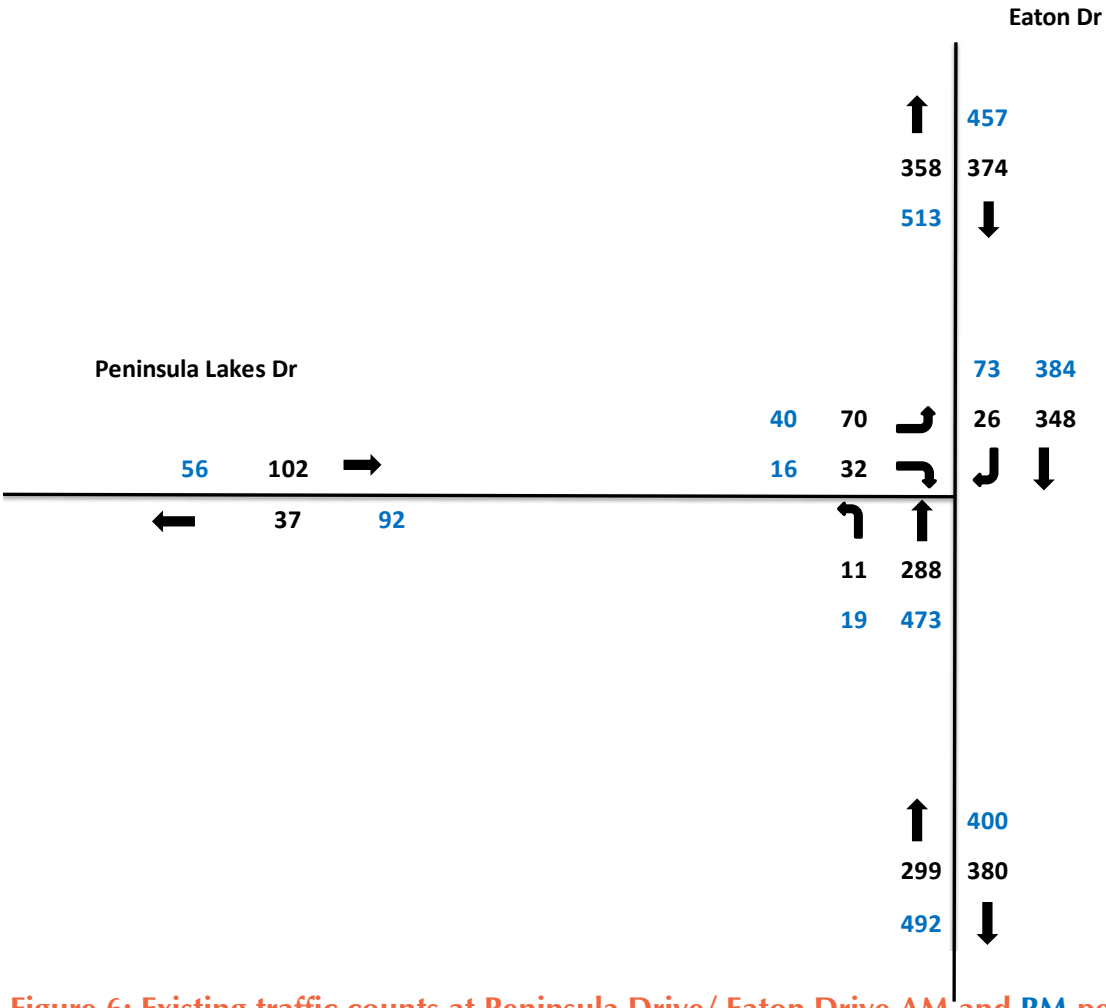

Figure 6: Existing traffic counts at Peninsula Drive/ Eaton Drive AM and PM peak hours

4.4 Public Transport

The bus routes surrounding the site are shown in Figure 7. Route 844 (Bunbury – Eaton/Millibridge) runs along Peninsula Lakes Drive to the south of the proposed Parkride and Millbridge Structure Plan areas while Route 845 (Bunbury – Australind) runs along Eaton Drive to the east. Both routes begin at the Bunbury Bus station. Route 844 terminates at Millbridge Boulevard/Braddon Way, while Route 845 terminates at Kingston Drive/Holbrook Road to the northwest of the Site.

Figure 7: Existing Bus Routes

4.5 Pedestrian and Cyclist Facilities

Currently, shared paths are present on both sides of Eaton Drive. These existing shared paths are anticipated to be the primary pedestrian and bicycle connections from the proposed subdivision site to the surrounding areas.

This existing shared path network along Eaton Drive will allow future residents of the proposed subdivision to safely walk or cycle to nearby destinations including the existing bus stops.

4.6 Changes to the surrounding road network

As part of the proposed subdivision a full movement intersection will be constructed on Eaton Drive. The road network of the proposed subdivision will also connect to the road network of the proposed Parkridge Estate in a number of locations.

4.7 Public Transport Network Planning

There are no immediate plans to modify the TransBunbury network within the area.

5 Proposed Internal Transport Network

5.1 Road Hierarchy

The proposed hierarchy of roads within the proposed subdivision area is generally in line with the original approved SP and is illustrated in **Figure 8**. The proposed road hierarchy was based on traffic projections and the road classification of the WAPC Liveable Neighbourhoods guidelines (2007).

Figure 8: Proposed Road Hierarchy

The projected traffic volumes on all subdivision road network are estimated to be less than 3,000vpd and all subdivision roads can be classified as Access Streets.

The majority of the proposed subdivision internal roads are classified as Access Street D roads. The Access Street D typical cross section entails 4.5m verges on both sides, with embayed parking provided in the verges as appropriate, such as for visitor parking for rear loading lots. Access Street D classification is proposed for the local roads with less than 1,000vpd.

The proposed subdivision plan has designated a wider road reserve width of approximately 18 metres for Road 1 and Road 4. These roads will provide the key connections to the adjacent Parkridge Estate development.

Similarly, Road 7, which is the primary north-south road within the proposed subdivision and connects Road 1 and Road 4, has also been planned with an 18-metre road reserve width.

The plan of subdivision includes a widening of the road at the intersection of Road 4 and Eaton Drive. This widening will accommodate separate left-turn and right-turn lanes at this intersection. However, SIDRA intersection analysis undertaken indicates that the widening in the form of separate left and right turn lanes may not be required at the Road 4 and Eaton Road intersection.

The internal road network will be designed to accommodate suitable service vehicles. Waste collection for the proposed subdivision will be as per the standard arrangement for residential developments throughout the Shire od Dardanup. This consists of rubbish bins wheeled out by the residents for verge collection on the designated collection day. A bin pad will be provided for the residents that would live along the proposed 10m laneway between Road 4 and Road 9 (Lots 95,96, 102 and 103) to facilitate this collection process. The location of the proposed bin pad in the plan of subdivision is indicative only and would be subject to further investigation at the detailed design stage.

5.2 Integration with Surrounding Area

The proposed land uses within the proposed subdivision are residential and are in line with the approved SP. The road network of the proposed subdivision area is proposed to connect to the neighbouring landholding at a number of locations to improve permeability and facilitate connection to surrounding regional roads.

6 Analysis of the Transport Network

6.1 Assessment Period

The assessment year that has been adopted for this analysis is 2038, with the assumption of full development of the Southbank and Parkridge Estate.

6.2 Traffic generation and distribution

The daily traffic generation rate used for this transport assessment is 8 vehicle trips per day (vpd) per dwelling, which corresponds to peak hour trip generation rates of 0.8vph per dwelling recommended in the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines* (2016).

The proposed subdivision is expected to accommodate approximately 140 dwellings (119 + 21 grouped housing) which would generate 1,120 trips per day or 112vph. These figures include both inbound and outbound vehicle movements. The AM and PM peak hour trip generation of the proposed subdivision is also summarised in **Table 1**.

Table 1: Subdivision peak hour trip generation

Land use	Quantity	AM trips	PM trips	AM		PM	
				IN	OUT	IN	OUT
Proposed subdivision	140	112	112	28	84	86	24

Review of the turning traffic counts at the existing Peninsula Lakes Drive/Eaton Drive intersection indicates that approximately 70% and 80% of the existing residents would travel northbound on Eaton Drive during the AM and PM peak hours, respectively, with the remaining balance traveling southbound on Eaton Drive.

To provide a robust assessment, it is assumed that all traffic from the proposed subdivision would utilise the subdivision access intersection at Road 4/Eaton Drive. Based on this assumption, the trip distribution at the Road 4/Eaton Drive intersection is illustrated in **Figure 9**.

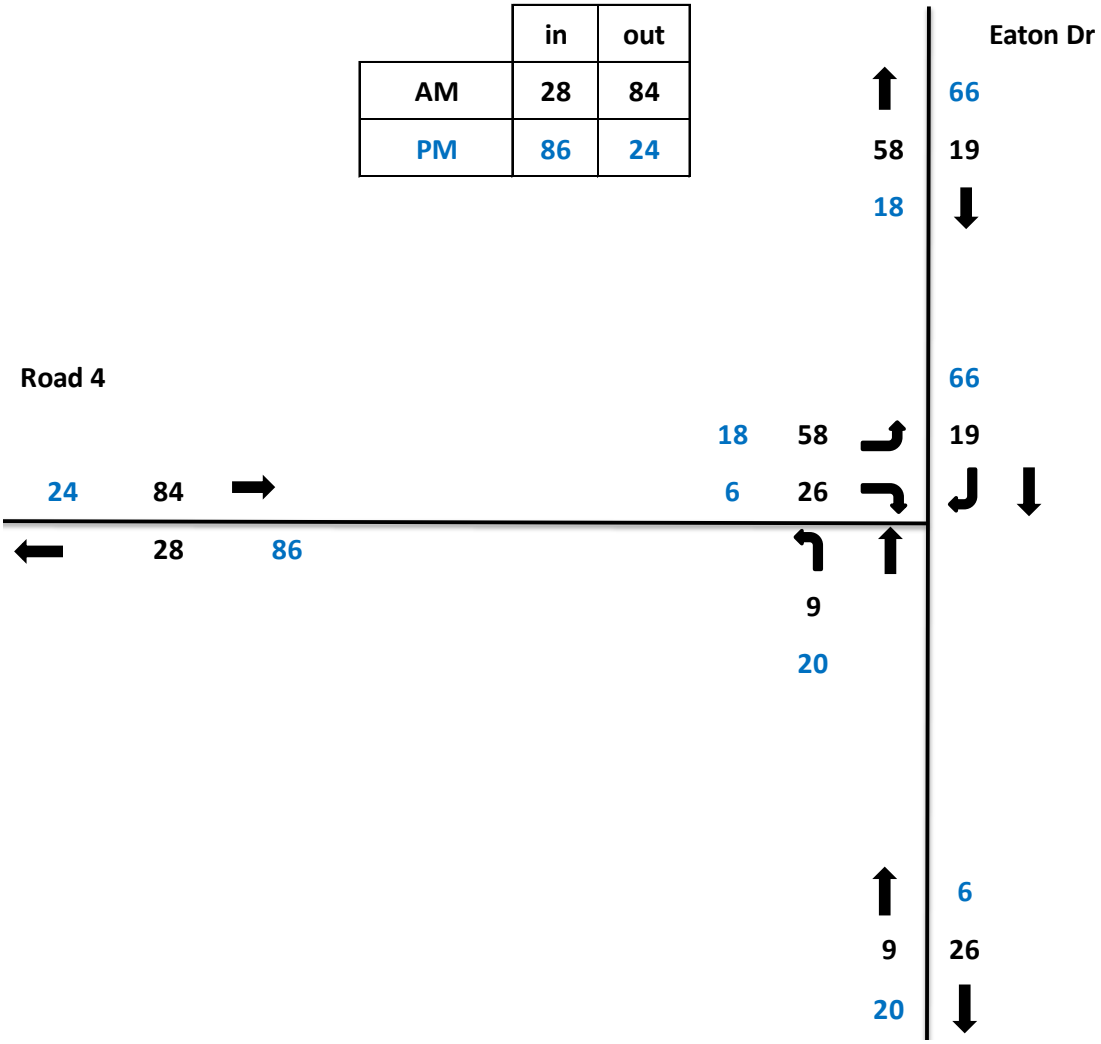

Figure 9: Subdivision traffic distribution at Eaton Drive intersection AM/ PM peak hour

Review of the Riley Consulting TIA for Parkridge Estate approved SP (April 2018) indicates that *"the concept layout for Parkridge indicates the North Stage to yield 316 lots, South Stage 211 lots and the River Stage 48 lots. In total the development could yield 575 residential lots"*.

Stantec TIA for Parkridge Estate amended SP (March 2023) assumed 666 dwellings for Parkridge Estate.

Considering that the amended SP for Parkridge Estate is not approved the trip generation of the approved Parkridge Estate SP has been used for establishing the traffic interaction between the Southbank and Parkridge Estate. On this basis the total 575 residential lots within the Parkridge Estate would generate about 4,600vpd or 460vph out of which about 2,528vpd or 253vph would be associated to the North Stage.

It is expected that some of the Parkridge Estate traffic (particularly the residents of North Stage) that would like to travel north would use the proposed subdivision

connection on Eaton Drive, as it is easier to travel north rather than heading south towards Peninsula Lakes Drive and travelling north along Eaton Drive. Similarly, some of the Parkridge Estate residents who return from the north would turn right into Road 4 of the subdivision rather than going further south to turn right into Peninsula Drive.

For the sake of robust assessment, it is assumed that all the residents of North Stage within Parkridge Estate who would like to travel north/ or return from north on Eaton Drive would use the subdivision Road 4 and its intersection with Eaton Drive. The trip distribution of Parkridge Estate at the Road 4/Eaton Drive intersection is illustrated in Figure 10.

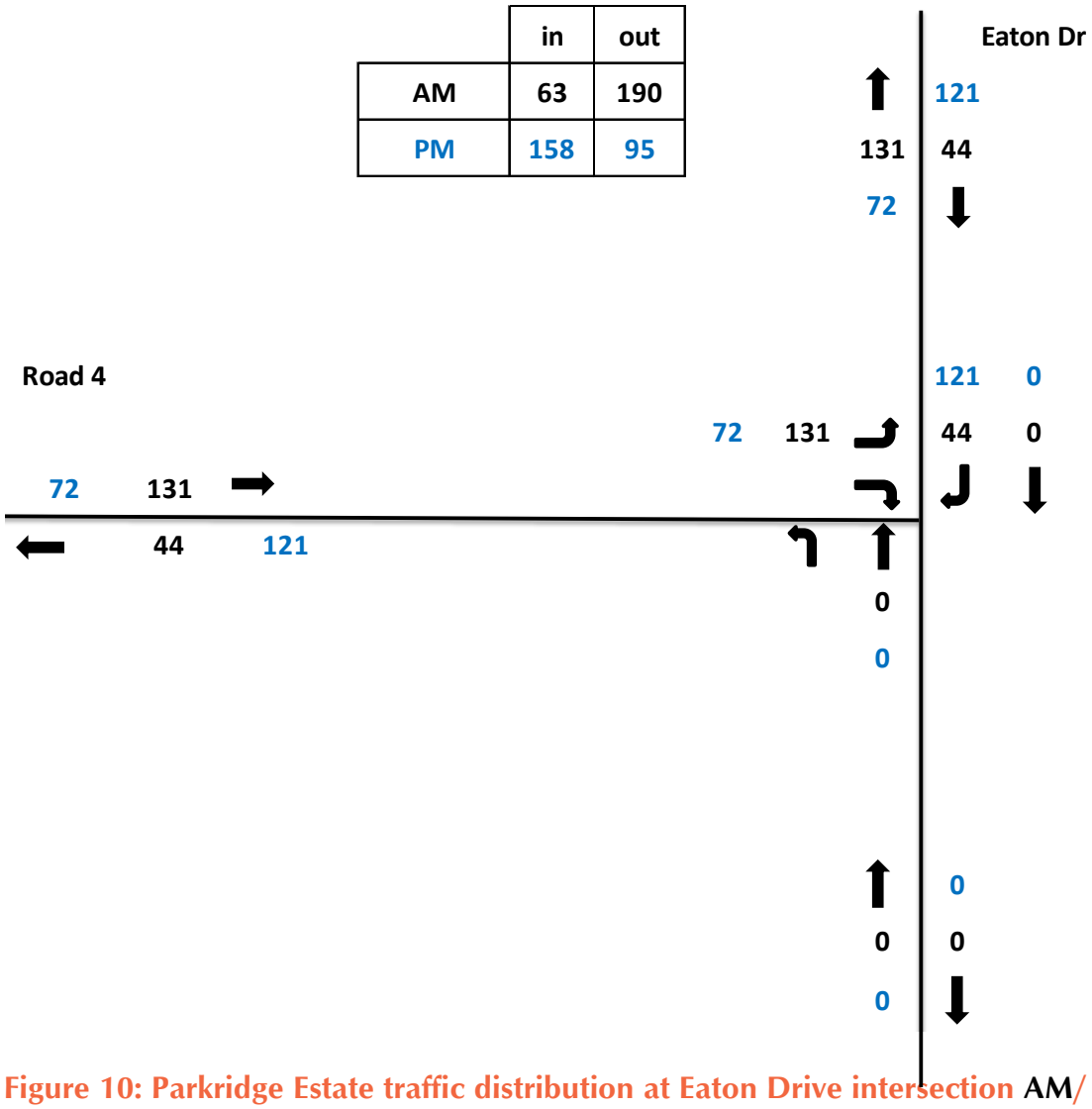

Figure 10: Parkridge Estate traffic distribution at Eaton Drive intersection AM/ PM peak hour

6.3 Traffic flow forecast on Surrounding roads

The peak hour traffic projections are illustrated in Figure 11. For through traffic on Eaton Drive a general 2% growth rate have been applied from 2022 to 2038 (16 years).

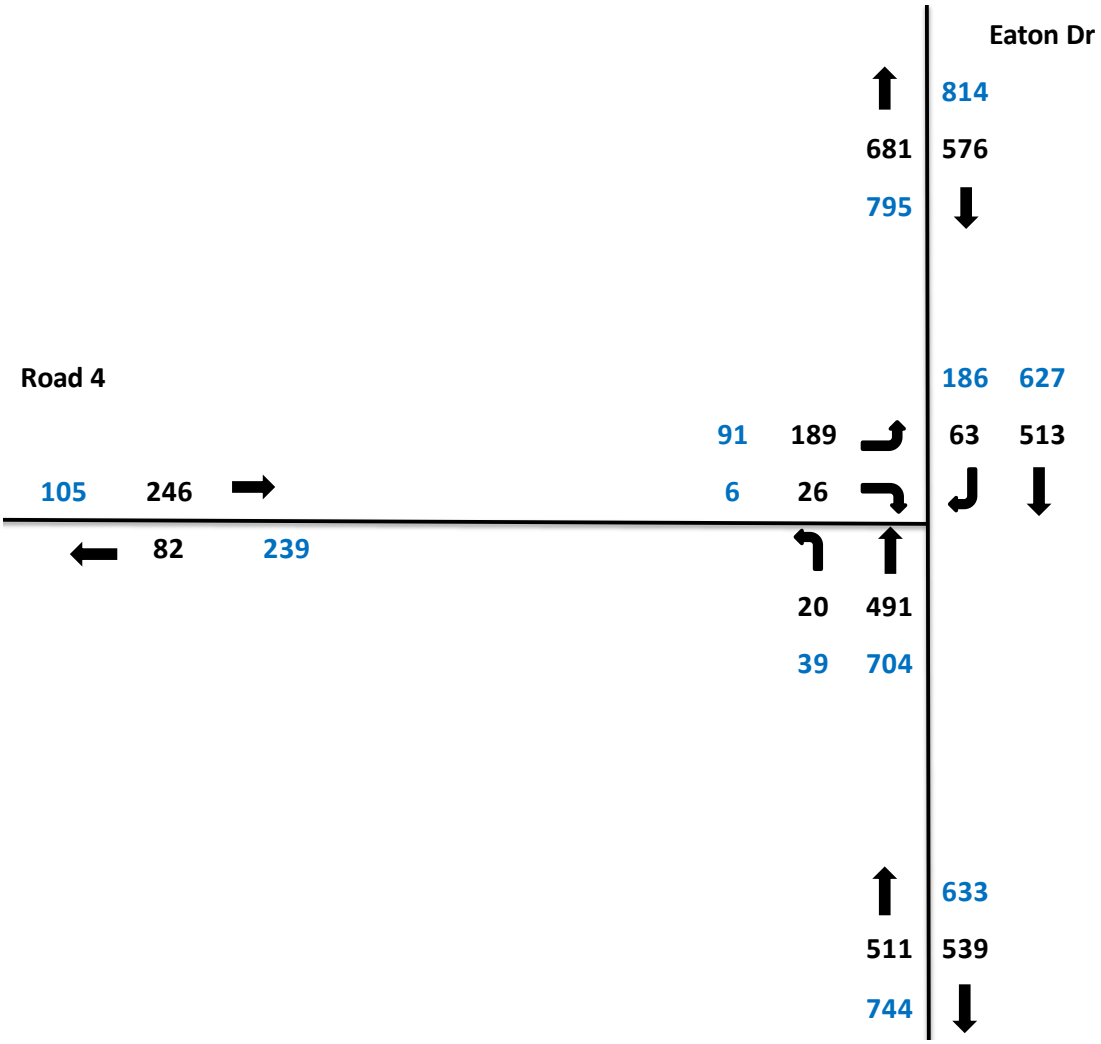

Figure 11: 2038 traffic projections at Eaton Drive intersection AM/ PM peak hour

6.4 Roads and Intersections

Figure 12 illustrates proposed intersection controls for key intersections within the subdivision area. There are two four-way intersections shown on the subdivision internal road network on low-traffic-volume roads. These intersections are recommended to be constructed as priority-controlled intersections with Give Way control on the minor road approaches as suggested in Liveable Neighbourhoods document. Appropriate entry treatments are recommended on the side roads to help to alert drivers to the presence of the intersections and that traffic on the major road has priority.

The subdivision access intersection at Eaton Drive (Road 4 / Eaton Drive) will be in the form of a priority-controlled T-intersection.

Currently, there is a right-turn lane of approximately 75 metres in place on Eaton Drive at this intersection, along with a seagull island. This existing infrastructure facilitates the right-turn movements in and out of the proposed subdivision area.

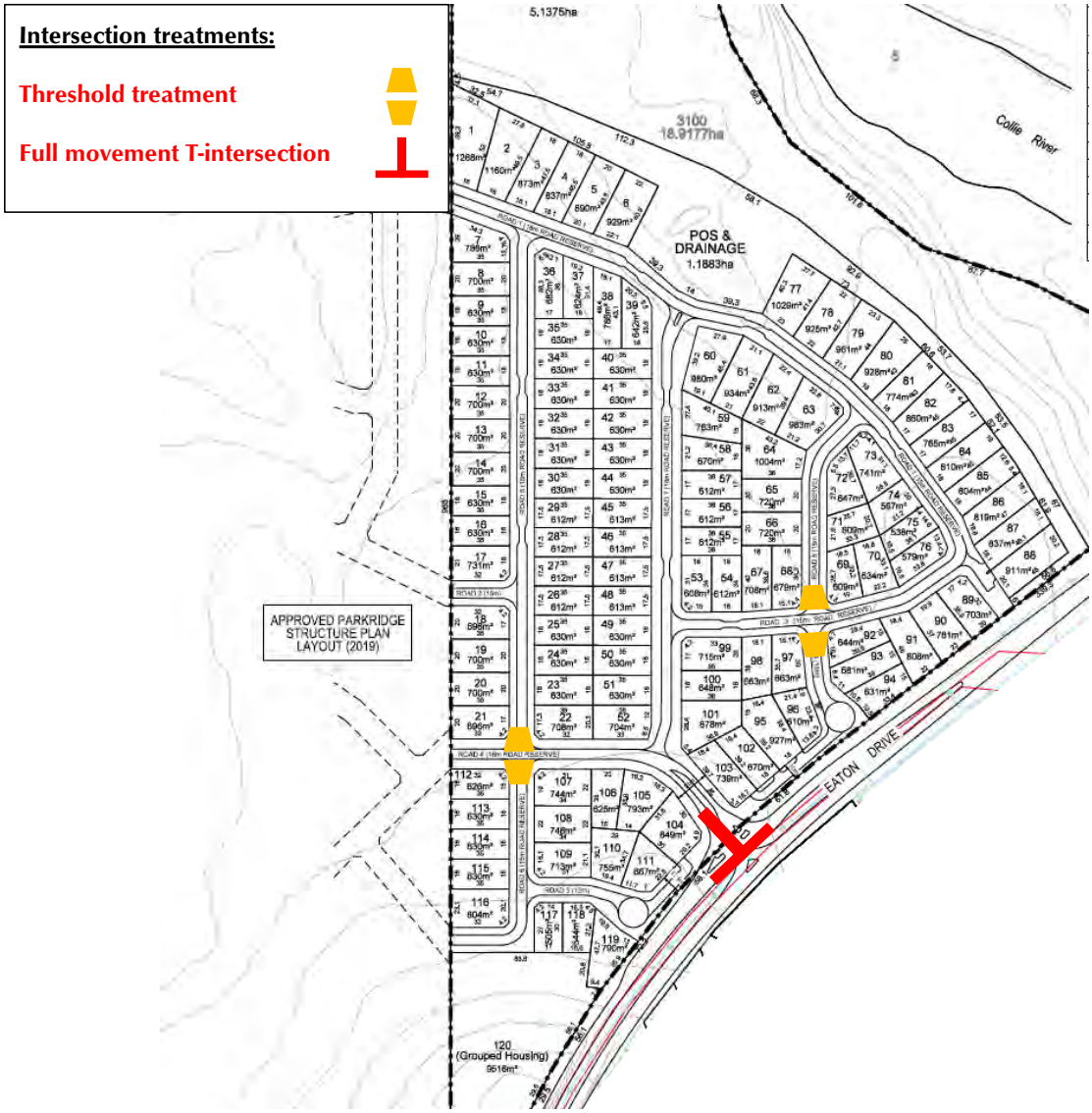

Figure 12: Proposed intersection treatments

6.5 Intersection Analysis

The operation of the Road 4/ Eaton Drive intersection was analysed in SIDRA for the weekday AM and PM peak hours in 2038.

SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation (DoS)**: is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service (LoS)**: is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay**: is the average of all travel time delays for vehicles through the intersection.
- **95% Queue**: is the queue length below which 95% of all observed queue lengths fall.

The results of the SIDRA analysis are attached in **Appendix E** and briefly discussed in the following paragraphs.

Road 4/ Eaton Drive intersection

The existing layout of Eaton Drive at the proposed Road 4 intersection is shown in **Figure 13**. This includes a large median and seagull island on Eaton Drive, which would facilitate a two-stage crossing for right-turn movements out of Road 4 onto Eaton Drive. Additionally, the free-flow right-turn lane on Eaton Drive would further assist the second stage of the right-turn movement.

The layout of the intersection modelled in SIDRA is illustrated in **Figure 14**. This SIDRA model reflects the existing seagull island and right-turn lane on Eaton Drive, but does not include any widening on Road 4.

The SIDRA analysis results indicate that this intersection, with the layout shown in **Figure 14**, would operate satisfactorily during the 2038 AM and PM peak hours, with minimal queues and delays on all approaches.

While the SIDRA modelling suggests that the widening of Road 4 to provide separate left and right-turn lanes (as shown in the subdivision plan) may not be necessary, it is recommended that the final layout of the intersection be reviewed and refined during the detailed design stage. This will ensure the intersection is optimised to safely and efficiently accommodate the anticipated traffic movements and pedestrian movements at the intersection.

Figure 13: Existing layout of the Eaton Road at future Road 4 intersection

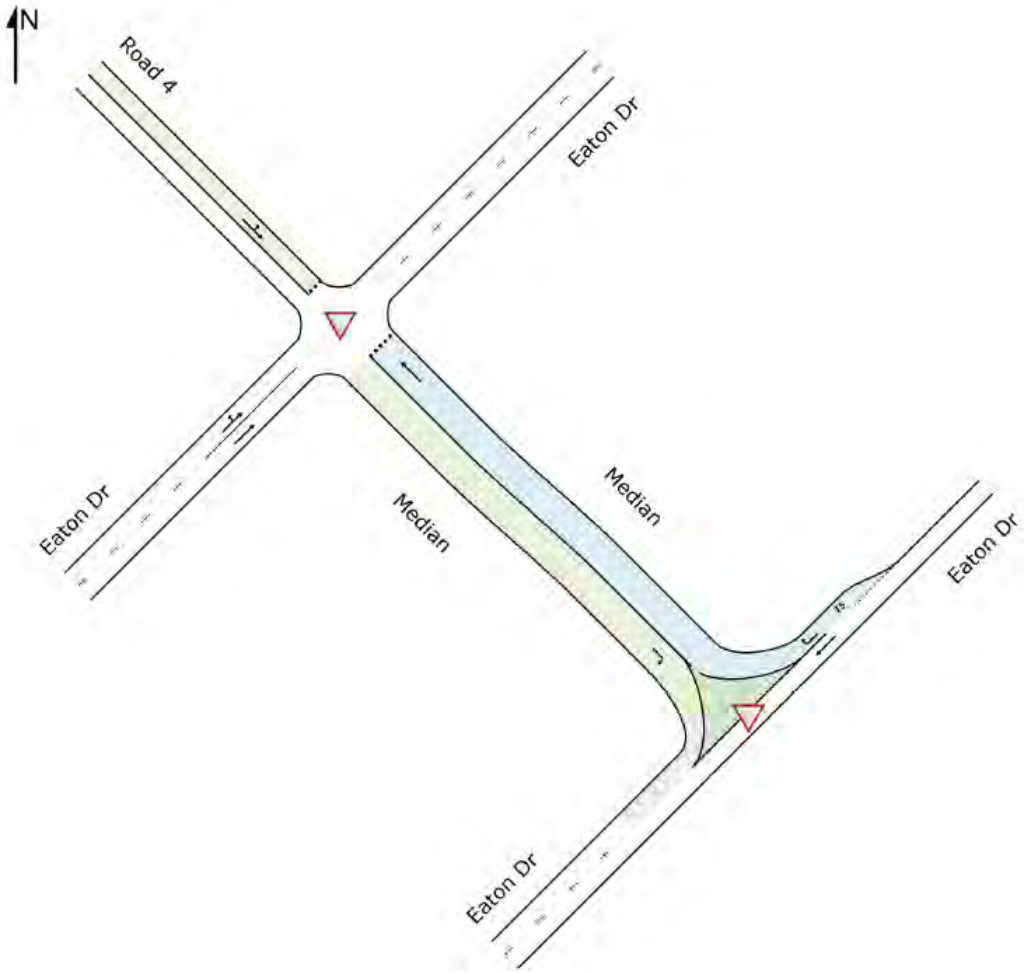

Figure 14: The intersection layout modelled in SIDRA

6.6 Access to Frontage Properties

The WAPC *Liveable Neighbourhoods* policy requires that "Development along integrator B and neighbourhood connector streets with ultimate vehicle volumes over 5000 vehicles per day should be designed either so vehicles entering the street can do so travelling forward, or are provided with alternative forms of vehicle access. Wider lots with paired driveways and protected reversing areas in the parking lane may be used on streets with up to 7000 vehicles per day."

All of the roads within the proposed subdivision area are expected to carry less than 5,000vpd, so no restriction on vehicular access is required.

6.7 Pedestrian/ Cycle Network

Pedestrian access to/from the proposed subdivision will be provided via the existing shared paths along Eaton Drive. These existing paths on both sides of Eaton Drive will serve as the primary pedestrian connections from the subdivision to the surrounding areas.

Within the proposed subdivision itself, all access streets will have a 2.0-meter-wide footpath constructed on one side of the street.

The existing shared paths on Eaton Drive, combined with the new subdivision footpaths, will create a pedestrian circulation network to serve the residents of the subdivision and facilitate connectivity to the broader community.

6.8 Access to Public Transport

The WAPC *Transport Assessment Guidelines for Developments* (2006) suggest that it is desirable for at least 90 per cent of dwellings to be within 400m straight line distance of a bus route. The existing bus route 845 on Eaton Drive will cover the majority of the dwellings within the proposed subdivision.

7 Conclusion

This Traffic Impact Assessment (TIA) has been prepared by Transcore on behalf of Ardross Estates (S.A.) Pty Ltd for the proposed subdivision at Lot 3001 Eaton Drive, known as Southbank, located in the Shire of Dardanup.

The Parkridge Estate is located immediately to the west of the Southbank. The traffic modelling and analysis undertaken in this TIA considers the full development of both Estates and the potential traffic interaction between them.

The plan of subdivision consists of 120 Lots (including one grouped housing site). The proposed subdivision plan has been prepared to respond to the current demands for choice in housing style combined with the physical attributes of the land and its connection to the neighbouring Estate.

The plan of subdivision shows the location and alignment of the connection points between the Southbank and Parkridge Estates. A review of the road reserve widths along the connection points reveals that the proposed subdivision has used a similar road reserve width as the endorsed Parkridge SP. This alignment of the road reserve widths between the two developments would facilitate the integration of the movement networks as demonstrated in **Figure 2**.

The proposed subdivision is expected to accommodate approximately 140 dwellings (119 + 21 grouped housing) which would generate 1,120 trips per day or 112vph.

The existing layout of Eaton Drive includes a large median and seagull island that would facilitate a two-stage crossing for right-turn movements out of Road 4 onto Eaton Drive, further supported by the free-flow right-turn lane on Eaton Drive.

The intersection layout modelled in SIDRA reflects these existing features on Eaton Drive but does not include any widening on Road 4, and the SIDRA analysis indicates this intersection would operate satisfactorily during the 2038 peak hours, though it is recommended that the final layout be reviewed and refined during the detailed design stage to ensure it is optimised to safely and efficiently accommodate both vehicular and pedestrian movements at the intersection.

The proposed hierarchy of roads within the proposed subdivision area is generally in line with the original approved SP.

(Appendix ORD: 12.2.3A)

Appendix A

APPROVED GARDEN OF EATON LOCAL STRUCTURE PLAN

transcore

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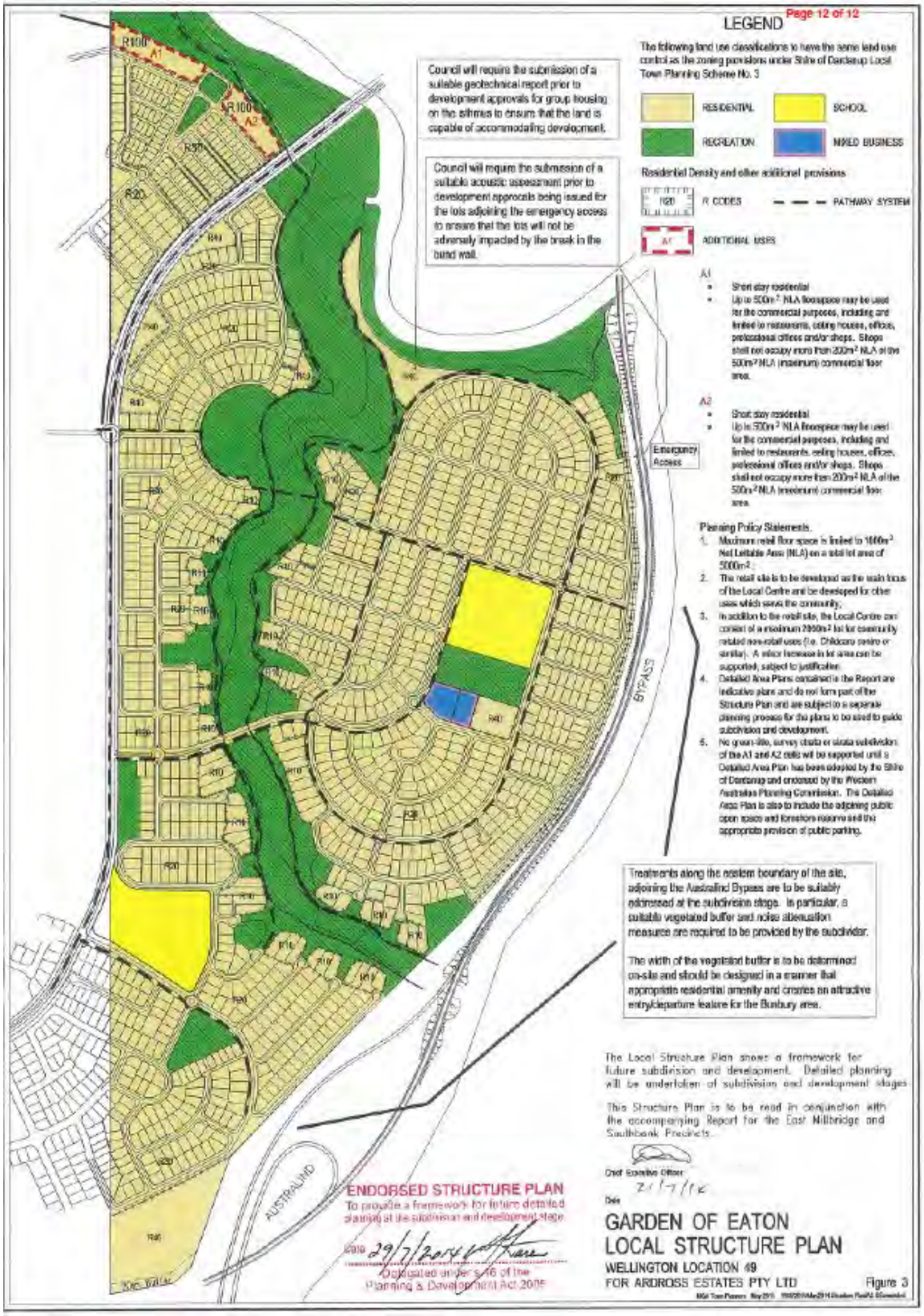
LEGEND
Page 12 of 12
The following land use classifications to have the same land use control as the zoning provisions under Shire of Dardanup Local Town Planning Scheme No. 3
RESIDENTIAL
SCHOOL
RECREATION
MIXED BUSINESS
Residential Density and other additional provisions
R CODES
PATHWAY SYSTEM
ADDITIONAL USES
Council will require the submission of a suitable geotechnical report prior to development approvals for group housing on the sitmas to ensure that the land is capable of accommodating development.
Council will require the submission of a suitable acoustic assessment prior to development approvals being issued for the lots adjoining the emergency access to ensure that the lots will not be adversely impacted by the break in the bund wall.
A1
Short stay residential
Up to 500m² NLA floorspace may be used for the commercial purposes, including and limited to restaurants, eating houses, offices, professional offices and/or shops. Shops shall not occupy more than 200m² NLA of the 500m² NLA (maximum) commercial floor area.
A2
Short stay residential
Up to 500m² NLA floorspace may be used for the commercial purposes, including and limited to restaurants, eating houses, offices, professional offices and/or shops. Shops shall not occupy more than 200m² NLA of the 500m² NLA (maximum) commercial floor area.
Emergency Access
Planning Policy Statements.
1. Maximum retail floor space is limited to 1000m² Net Lettable Area (NLA) on a total lot area of 5000m².
2. The retail site is to be developed as the main focus of the Local Centre and be developed for other uses which serve the community.
3. In addition to the retail site, the Local Centre can consist of a maximum 2000m² lot for community related non-retail uses (i.e. Childcare centre or similar). A minor increase in lot area can be supported, subject to justification.
4. Detailed Area Plans contained in the Report are indicative plans and do not form part of the Structure Plan and are subject to a separate planning process for the plans to be used to guide subdivision and development.
6. No green-title, survey strata or strata subdivision of the A1 and A2 lots will be supported until a Detailed Area Plan has been adopted by the Shire of Dardanup and endorsed by the Western Australian Planning Commission. The Detailed Area Plan is also to include the adjoining public open space and foreshore reserve and the appropriate provision of public parking.
Treatments along the eastern boundary of the site, adjoining the Australind Bypass are to be suitably addressed at the subdivision stage. In particular, a suitable vegetated buffer and noise attenuation measure are required to be provided by the subdivider.
The width of the vegetated buffer is to be determined on-site and should be designed in a manner that appropriate residential amenity and creates an attractive entry/departure feature for the Bunbury area.
The Local Structure Plan shows a framework for future subdivision and development. Detailed planning will be undertaken at subdivision and development stages.
This Structure Plan is to be read in conjunction with the accompanying Report for the East Millbridge and Southbank Precincts.
Chief Executive Officer
Date
ENDORSED STRUCTURE PLAN
To provide a framework for future detailed planning at the subdivision and development stage
Date 29/7/2014
Delegated under s.16 of the Planning & Development Act 2005
BYPASS
AUSTRALIND
GARDEN OF EATON
LOCAL STRUCTURE PLAN
WELLINGTON LOCATION 49
FOR ARDROSS ESTATES PTY LTD
Figure 3

(Appendix ORD: 12.2.3A)

Appendix B

APPROVED PARKRIDGE ESTATE LOCAL STRUCTURE PLAN

transcore

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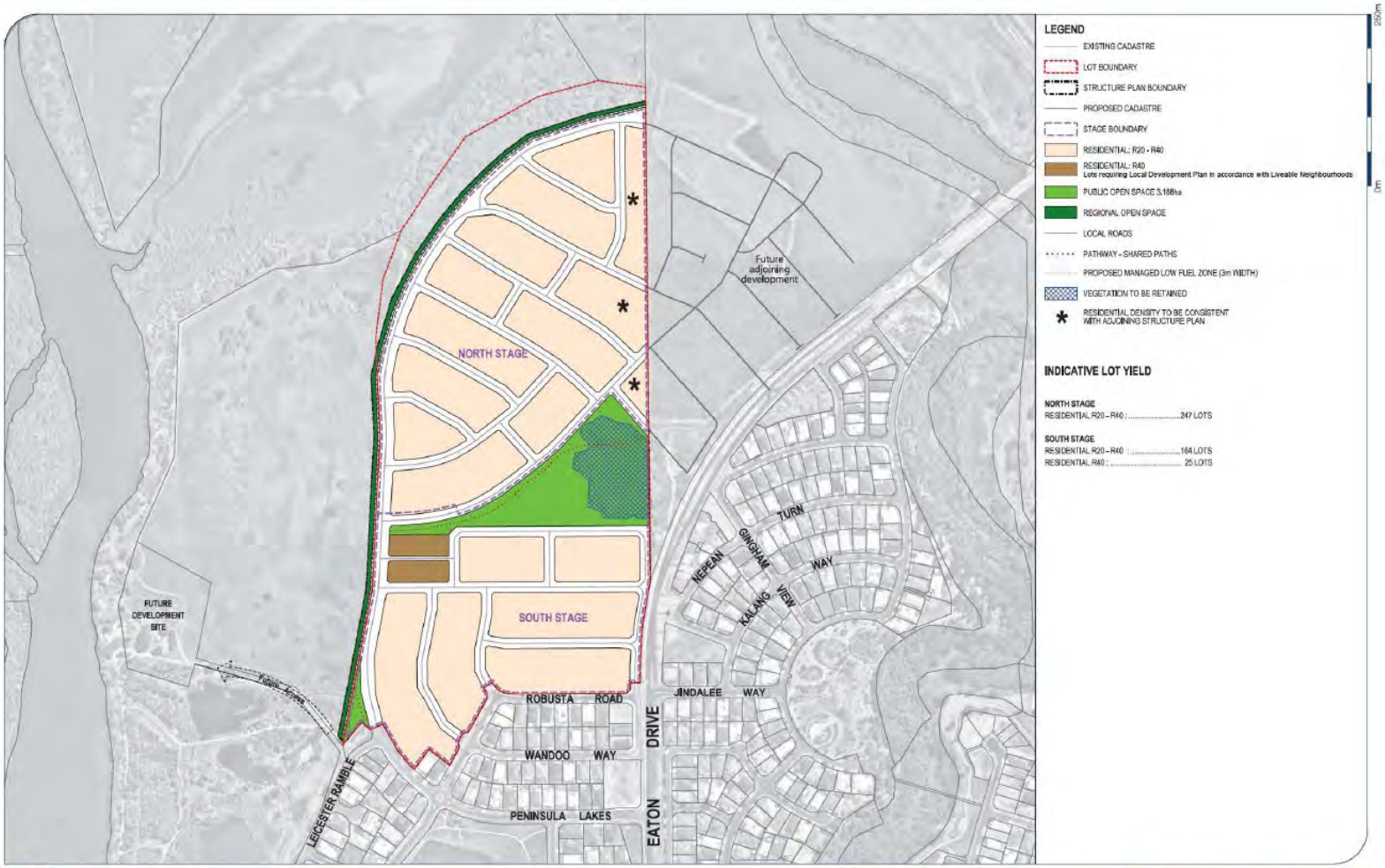

Figure 1 - Local Structure Plan

(Appendix ORD: 12.2.3A)

Appendix C

AMENDED PARKRIDGE ESTATE LOCAL STRUCTURE PLAN

transcore

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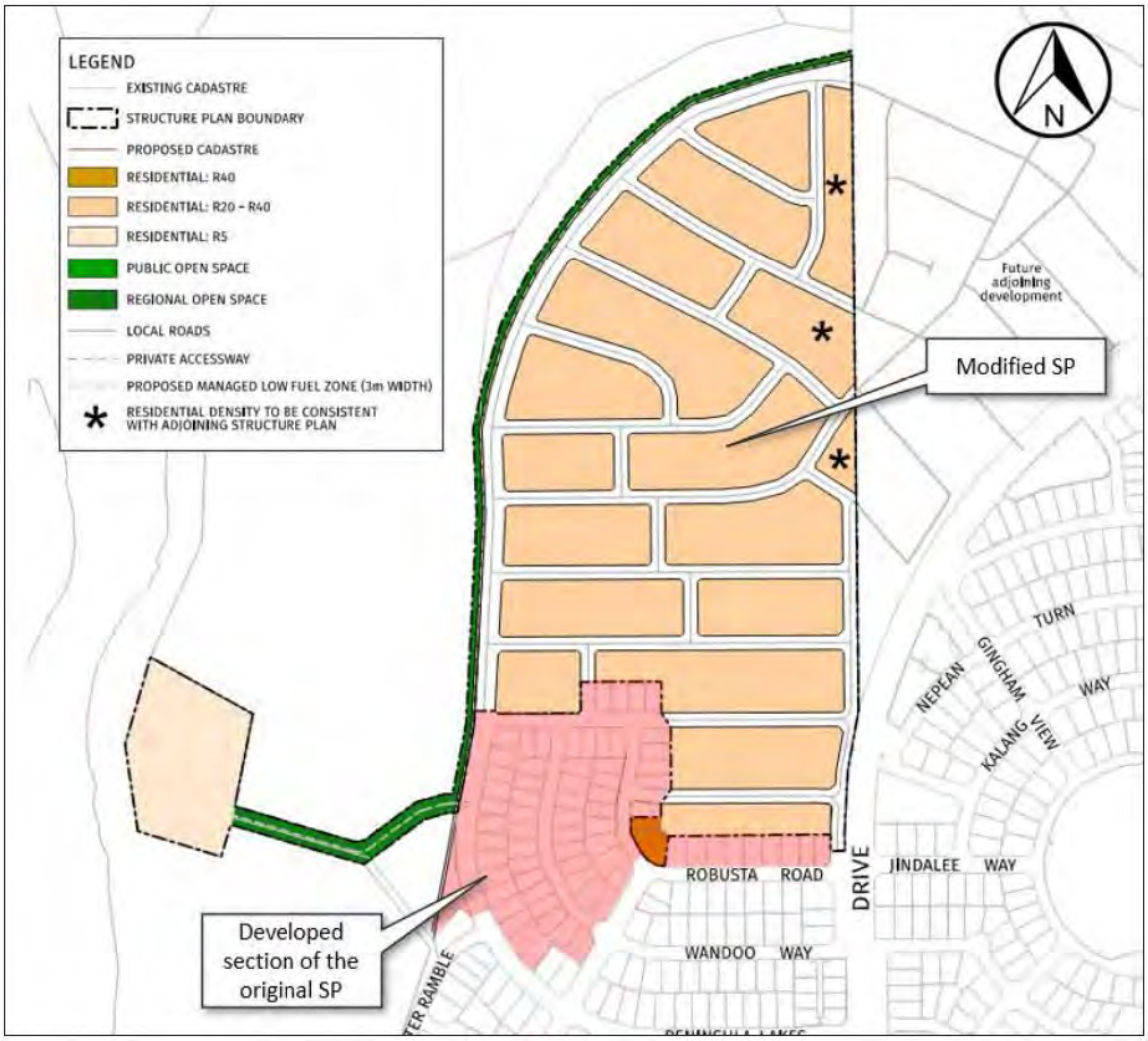
LEGEND
EXISTING CADASTRE
STRUCTURE PLAN BOUNDARY
PROPOSED CADASTRE
RESIDENTIAL: R40
RESIDENTIAL: R20 - R40
RESIDENTIAL: R5
PUBLIC OPEN SPACE
REGIONAL OPEN SPACE
LOCAL ROADS
PRIVATE ACCESSWAY
PROPOSED MANAGED LOW FUEL ZONE (3m WIDTH)
RESIDENTIAL DENSITY TO BE CONSISTENT WITH ADJOINING STRUCTURE PLAN
N
Future adjoining development
Modified SP
Developed section of the original SP
ROBUSTA ROAD
WANDOO WAY
DRIVE
JINDALEE WAY
NEPEAN
GINGHAM
TURN
WAY
KALANG VIEW

(Appendix ORD: 12.2.3A)

Appendix D

PLAN OF SUBDIVISION

transcore

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LEGEND
LOT SUMMARY
POS
(Kalgulup Regional Park)
POS &
DRAINAGE
EATON DRIVE
Plan of Subdivision - Freehold
LOT 3001 EATON DRIVE, EATON
DRAFT
Taylor
Burrell
Barnett

(Appendix ORD: 12.2.3A)

Appendix E

SIDRA ANALYSIS

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MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 1 - 2038 - AM (Site Folder: 2038)]

Network: N101 [AM (Network Folder: 2038)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV %	ARRIVAL FLOWS [Total veh/h]	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Median														
5	T1	66	2.0	66	2.0	0.074	2.2	LOS A	0.3	2.0	0.47	0.39	0.47	30.6
Approach		66	2.0	66	2.0	0.074	2.2	LOS A	0.3	2.0	0.47	0.39	0.47	30.6
NorthWest: Road 4														
1	L2	199	2.0	199	2.0	0.187	5.6	LOS A	0.8	6.1	0.37	0.59	0.37	43.3
2	T1	27	2.0	27	2.0	0.187	6.8	LOS A	0.8	6.1	0.37	0.59	0.37	29.0
Approach		226	2.0	226	2.0	0.187	5.7	LOS A	0.8	6.1	0.37	0.59	0.37	42.8
SouthWest: Eaton Dr														
3	L2	21	2.0	21	2.0	0.145	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	48.6
4	T1	517	4.0	517	4.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		538	3.9	538	3.9	0.145	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
All Vehicles		831	3.2	831	3.2	0.187	1.9	NA	0.8	6.1	0.14	0.21	0.14	48.0

MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 2 - 2038 - AM (Site Folder: 2038)]

Network: N101 [AM (Network Folder: 2038)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV %	ARRIVAL FLOWS [Total veh/h]	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Eaton Dr														
2	T1	540	4.0	540	4.0	0.291	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	66	2.0	66	2.0	0.037	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	44.5
Approach		606	3.8	606	3.8	0.291	0.6	NA	0.0	0.0	0.00	0.06	0.00	49.5
NorthWest: Median														
1	R2	27	2.0	27	2.0	0.014	0.2	LOS A	0.0	0.0	0.00	0.05	0.00	20.5
Approach		27	2.0	27	2.0	0.014	0.2	NA	0.0	0.0	0.00	0.05	0.00	20.5
All Vehicles		634	3.7	634	3.7	0.291	0.6	NA	0.0	0.0	0.00	0.06	0.00	47.9

MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 1 - 2038 - PM (Site Folder: 2038)] **Network: N101 [PM (Network Folder: 2038)]**

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV [ ] %	ARRIVAL FLOWS [Total veh/h]	HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist [ ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Median														
5	T1	196	2.0	196	2.0	0.289	4.7	LOS A	1.2	9.1	0.63	0.70	0.72	25.9
Approach		196	2.0	196	2.0	0.289	4.7	LOS A	1.2	9.1	0.63	0.70	0.72	25.9
NorthWest: Road 4														
1	L2	96	2.0	96	2.0	0.094	5.9	LOS A	0.4	2.8	0.42	0.61	0.42	43.1
2	T1	6	2.0	6	2.0	0.094	9.2	LOS A	0.4	2.8	0.42	0.61	0.42	28.6
Approach		102	2.0	102	2.0	0.094	6.1	LOS A	0.4	2.8	0.42	0.61	0.42	42.8
SouthWest: Eaton Dr														
3	L2	41	2.0	41	2.0	0.211	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	48.4
4	T1	741	4.0	741	4.0	0.211	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
Approach		782	3.9	782	3.9	0.211	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles		1080	3.4	1080	3.4	0.289	1.7	NA	1.2	9.1	0.15	0.21	0.17	48.0

MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 2 - 2038 - PM (Site Folder: 2038)] **Network: N101 [PM (Network Folder: 2038)]**

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV [ ] %	ARRIVAL FLOWS [Total veh/h]	HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist [ ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
NorthEast: Eaton Dr														
2	T1	660	4.0	660	4.0	0.355	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
3	R2	196	2.0	196	2.0	0.121	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	44.5
Approach		856	3.5	856	3.5	0.355	1.2	NA	0.0	0.0	0.00	0.12	0.00	49.0
NorthWest: Median														
1	R2	6	2.0	6	2.0	0.003	0.2	LOS A	0.0	0.0	0.00	0.05	0.00	20.5
Approach		6	2.0	6	2.0	0.003	0.2	NA	0.0	0.0	0.00	0.05	0.00	20.5
All Vehicles		862	3.5	862	3.5	0.355	1.2	NA	0.0	0.0	0.00	0.12	0.00	48.8

(Appendix ORD: 12.2.3A)

Attachment G

Local Water Management Strategy

hyd2o HYDROLOGY

Lot 3001 Eaton Drive Eaton
Local Water Management Strategy

February 2025

Client: Ardross Estates (S.A.) Pty Limited

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Disclaimer

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Executive Summary

This Local Water Management Strategy (LWMS) has been prepared by Hyd2o on behalf of the Ardross Estates (S.A.) Pty Limited in support of the development of the local structure plan (LSP) for Lot 3001 Eaton Drive, Eaton.

A previous structure plan designed by MGA Town Planners encompassing the site was approved in 2010 and amended in 2014.

The development area of the site is approximately 14 ha in size (herein referred to as the site) and located approximately 9 km northeast of the Bunbury central business district, within the Shire of Dardanup. The northern part of Lot 3001 is located within the Kalgulup Regional Park boundary and is to be ceded as development occurs.

Understanding key hydrological considerations has informed the development of the LSP and LWMS for the site, together with geotechnical and environmental investigations. Potential opportunities and constraints across the site have been identified and are accommodated in the proposed design.

The site is a rural property with livestock grazing characterized by undulating cleared pasture with minimal tree and understorey vegetation. The topography of the site falls from the south at 12 mAHD to the north at 3 mAHD, sloping into the direction of Collie River. Most of the site is classified as a multiple use wetland.

The proposed future residential development will utilise water sensitive urban design principles and best management practices to ensure that total water cycle management will be achieved.

This LWMS has been prepared in accordance with the principles, objectives, and key criteria of Better Urban Water Management (Western Australian Planning Commission, 2008), and key input from government agencies including the Department of Water and Environmental Regulation (DWER) and Shire of Dardanup.

Implementation of the strategy will be undertaken in accordance with WAPC (2008) through the development and implementation of Urban Water Management Plans to support individual stages of development within the site.

The revised LSP is currently being prepared by Taylor Burrel Barnett. It is acknowledged that any land use amendments to the LSP from that detailed in this LWMS may necessitate a future review and potential revision (or Addendum) to be prepared for this LWMS.

Local Water Management Strategy Summary

Strategy Elements	LWMS Method & Approach
Water Use Sustainability	
Water Efficiency	• Use of water efficient fixtures and fittings • Use of water sensitive landscaping (native plantings in POS/ROS areas)
Water Supply	• Lots: Water Corporation reticulated supply • POS: Use of Groundwater
Wastewater	• Water Corporation reticulated sewerage.
Local and Regional Stormwater	
Flood Protection (1% AEP)	• Maintain existing flow paths for watercourses to downstream of the site • Provide 1% AEP storage areas within the site for attenuation of local stormwater to allowable predevelopment rates. • Establish minimum habitable floor levels at 0.5m above the 1% AEP catchment flood levels and 0.3m above 1% AEP stormwater retention areas. • Provide flood paths for overland flows within the development area which exceed the capacity of piped drainage.
Serviceability (20% AEP)	• Road drainage system to be designed so that roads will be passable in the 1 in 5 year event. • Attenuation of local stormwater in POS to allowable predevelopment rates
Ecological Protection (15mm event)	• 15mm event to be retained on site (where possible) • Bioretention areas to provide water quality treatment for small event runoff. • Establishment of storage invert levels no lower than seasonal maximum groundwater levels to prevent nutrient export • Implement non-structural controls
Groundwater	
Fill & Subsoil Drainage	• Development levels to ensure suitable clearance above regional groundwater levels. • AAMGL adopted as the controlled groundwater level (CGL) for the site • Subsoil drainage at CGL proposed to control post development groundwater rise.
ASS & Contamination	• ASS risk mapping for the site indicates that the majority of the site is classified as having a moderate to low risk of ASS occurring less than 3m from surface, with high to moderate risk observed in the northern corners along the site boundary. • Further investigation to be conducted as a separate process and reported in UWMP.
Implementation	
UWMP's	• Development of Urban Water Management Plans for individual stages of development consistent with BUWM (WAPC, 2008) requirements.

1. Introduction

Hyd2o was commissioned by the Ardross Estates (S.A.) Pty Limited to compile this Local Water Management Strategy (LWMS) in support of the development of the Local Structure Plan (LSP) for Lot 3001 Eaton Drive, Eaton.

The development area of the site is approximately 14 ha in size (herein referred to as the site) and located approximately 9 km northeast of the Bunbury central business district, within the Shire of Dardanup (Figure 1). The northern part of Lot 3001 is located within the Kalgulup Regional Park boundary and is to be ceded as development occurs.

This LWMS provides an integrated total water cycle management approach to the development of the local structure plan, with an assessment of the pre-development environment, development of water use sustainability initiatives, a stormwater management strategy, a groundwater management strategy and a plan for implementation of subdivision plans.

This document has been prepared in accordance with the principles and objectives of *Better urban water management* (Western Australian Planning Commission, 2008).

A copy of the LWMS Checklist for Developers is included as Appendix A to assist the Shire of Dardanup and Department of Water & Environmental Regulation (DWER) in review of this document.

The revised LSP is currently being prepared by Taylor Burrel Barnett. It is acknowledged that any land use amendments to the LSP from that detailed in this LWMS may necessitate a future review and potential revision (or Addendum) to be prepared for this LWMS.

1.1 Planning Context

The site is predominantly zoned 'Urban' within the Greater Bunbury Region Scheme, with part of the lot reserved under 'Regional Open Space' under the Shire of Dardanup's Town Planning Scheme No.3.

This LWMS has been developed to be consistent with the framework and process detailed in Better Urban Water Management (WAPC, 2008). The relationship of this document to the planning process is shown in Table 1.

There is no overarching district scale drainage strategy for the site.

Table 1: Urban Water Management Process

Planning Phase	Planning Document	Urban Water Management Documents
Local	Local structure plan	Lot 3001 Eaton Drive Eaton Local Water Management Strategy **THIS DOCUMENT**
Subdivision	Subdivision application	Urban water management plan (for individual stages of development) **FUTURE PREPARATION**

1.2 Key Documents

This LWMS uses the following key documents to inform its principles, criteria, objectives, and implementation responsibilities:

- Better Urban Water Management (WAPC, 2008)
- Stormwater Management Manual for WA (DWER, 2022)
- Decision Process for Stormwater Management in WA (Department of Water, 2017)
- Lot 9004 Eaton Drive Eaton Local Water Management Strategy (Calibre, 2019)
- Millbridge Estate Stages 16-22 Urban Water Management Plan (GHD, 2014)

2. Proposed Development

The proposed development is shown in Figure 2. The development area of the site is approximately 14 ha in size.

The local structure plan consists of residential lots, grouped housing, public open space, regional open space, and roads.

The northern part of Lot 3001 is located within the Kalgulup Regional Park boundary and is to be ceded as development occurs.

The proposed development layout of the site has considered the predevelopment environment and the constraints posed by existing planning, adjacent developments, and watercourses, and used this information to inform and guide structure plan development.

3. Existing Environment

3.1 Site Conditions

The 14 ha site is bound by Collie River to the north, Eaton Drive and existing urban development to the east and south, and rural lots 9009 and 9505 to the west. The site is located within in the suburb of Eaton in the Shire of Dardanup (Figure 1).

The site is a rural type property with livestock grazing characterized by undulating pasture with minimal tree and understorey vegetation, with a small dam at north of property.

The topography of the site grades from the south at 12 mAHD to the north at 3 mAHD, sloping toward the Collie River as shown in Figure 3.

3.2 Geotechnical

Environmental geology mapping on the Bunbury-Burekep Urban Geology Part Sheet 2031 III and 2031 II (Geological Survey of Western Australia, 1981) is shown in Figure 4, indicating the site is characterised by areas of:

- Qpa - Msg4 - Guildford Formation - mainly alluvial sandy clay.
- Qpb - S8 - Bassendean Sands - low rounded dunes.
- Qhao - Sm1- Alluvium older river terraces.

A geotechnical investigation was conducted by Structerre (Appendix B) on 24 August 2022 and included the following activities: twelve Sample Retrieval Probes (SRPs) were advanced to a depth of 3.5 meters for material assessment and soil profiling; two in-situ percolation tests were performed to assess the permeability of the materials within the upper 1.0 meter; and six Dynamic Cone Penetrometer (DCP) tests were conducted to a depth of 1.0 meter to evaluate the relative densities of the upper layers. Testing locations are shown on Figure 4.

The soil profiles encountered are consistent with the conditions indicated in the environmental geology map. The percolation test conducted in the northeast section of the site revealed a low permeability rate of 1.0 m/day, indicating the need for the placement of free-draining sand above the reactive clay soils.

Hyd2o installed four groundwater monitoring bores within the site on 4 April 2024, at depths ranging from 5.0 to 9.5 meters below the surface. Bore logs are presented in Appendix C and indicate similar results to Structerre (2022).

3.3 Acid Sulphate Soils

Acid Sulphate Soil (ASS) is the common name given to naturally occurring soil and sediment containing iron sulfides. These naturally occurring iron sulfides are generally found in a layer of waterlogged soil or sediment and are benign in their natural state.

When disturbed and exposed to air, however, they oxidise and produce sulfuric acid, iron precipitates, and concentrations of dissolved heavy metals such as aluminium, iron and arsenic. Release of acid and metals as a result of the disturbance of ASS can cause significant harm to the environment and infrastructure.

The presence of ASS has been a recognised issue of concern in Western Australia since 2003. The Department of Environment and Conservation and the WAPC have released guidance notes on ASS, covering the requirement for assessing sites and the management of sites where ASS are identified. ASS investigations are commonly required as part of the conditions of subdivision or as a requirement for a dewatering license application.

The WAPC's Bulletin 64 (WAPC, 2003) ASS risk mapping for the site indicates that the majority of the site is classified as having a moderate to low risk of ASS occurring less than 3m from surface, with high to moderate risk observed in the northern corners along the site boundary (Figure 4).

3.4 Contaminated Sites

A search of the Department of Water and Environmental Regulation Contaminated Sites database indicates that there are no known contaminated sites within the project area.

The nearest contaminated sites classified as 'requiring remediation' is identified approximately 1.0 km downstream to the west of the site (Figure 5), on the opposite bank of the Collier River.

3.5 Wetlands/Environment

The majority of the site is classified as a multiple use wetland (Figure 5). There are no conservation category wetlands located within the site.

The northeast boundary of the site aligns with the Kalgulup Regional Park boundary. DBCA's mapped boundary of the Regional Park is shown in Figure 5. Kalgulup Regional Park comprises a mosaic of lands around Bunbury and the Leschenault Estuary within the local government areas of City of Bunbury, Shire of Capel, Shire of Dardanup and Shire of Harvey, covering an area of approximately 3,168 ha.

Based on DBCA (2021) the area of Lot 3001 ceded as Regional Open Space north of the site is to be vested in Shire of Dardanup when ceded to the State. Based on DBCA (2021) it is understood that local government authorities will have responsibility to manage areas of the park vested in or held by these entities, in accordance with the strategies outlined in the plan.

The site is classified as a Natural Environment Use management zone, with the area to be managed jointly for conservation and enhancement of native plants and animals, improvement of landscape qualities, public use and recreation.

3.6 Surface Water

The site is located adjacent to and within the catchment of Collie River, which discharges south to the Leschenault Estuary and ultimately into the Indian Ocean (Figure 6).

The site surface water runoff is predominately overland. Runoff from the highest point in the south travels toward the lower levels in the northern part of the site, partly flowing through an existing drain into a small dam prior to discharging in a north westerly direction to the adjacent property.

There is no clear formal channel or culvert at the discharge point, indicating water flow to be diffuse toward the Collie River in the northwest (Figure 6).

Landgate historical aerial imagery indicates the small dam was built in early 2000's with subsequent filling of land adjacent to the dam. This dam retains water within the site to approximately 3 mAHD before discharging downstream.

Floodplain mapping of the adjacent Collie River is shown in Figure 6, indicating the site to be outside the 1% Annual Exceedance Probability (AEP) floodway. The 1% AEP flood levels for the Collie River range from 3 mAHD to 3.25mAHD adjacent to the site.

A small portion of the site is located within the flood fringe of the Collie River (Figure 6). Filling of the flood fringe is permitted and does not preclude development. This is accounted for in modelling the site as detailed in Section 6.

3.7 Groundwater

Groundwater monitoring has been undertaken monthly at the site by Hyd2o and Ardross since April 2024 and will be concluded in November 2025 (covering two winter periods).

In April 2024, Hyd2o installed four groundwater monitoring bores at the site and has been monitoring three external bores, which were installed in 2009 by Calibre adjacent to the western boundary.

Additionally, four nearby long-term DWER bores (BY16B, BY17B, HS73B, and HS74A), located approximately 2.5 to 5.4 km from the site are also being monitored. Based on review of DWER's Water Information Reporting bore construction details, bore HS73B was selected to be used as a most representative long term bore for determining the site's Average Annual Maximum Groundwater Level (AAMGL). Bore HS73B is situated on Qpa soil (Guildford Formation, predominantly alluvial sandy clay), which is similar to the majority of the site, and has a screen inlet at 1-6 m below ground level (BGL), similar to the onsite bores. The long-term hydrograph for this DWER bore is presented in Appendix D, with site-specific recorded data detailed in Appendix E.

Groundwater level for bore HS73B was recorded in December 2024 by both Hyd2o and DWER. The AAMGL for the period 2000-2023 was calculated using the Water Information Reporting Database long term data. The estimated winter period of 14.52 mAHD for 2024 at this bore was only nominally higher (0.03m) than its 2000-2023 AAMGL estimate of 14.49 mAHD. Therefore no correction factor was considered to be required for site bores to determine the site AAMGL.

Site AAMGL's are shown in Table 3 and contoured in Figure 7. MGL's are estimated to be approximately 0.38m higher than the AAMGL. Groundwater flows at the site are from south to north, towards Collie River with the AAMGL ranging from 2.0 mAHD in the north of the site to 5.2 mAHD in the south.

Peak groundwater levels in 2024 occurred in August at bores MW01, MW03 and Ext 2, and in September at bores MW02, MW04, Ext 1 and Ext 3.

Based on DWER LiDAR DEM raster data, the natural surface clearance above AAMGL at the site ranges from approximately 0.3 m to 8.6 m.

Table 2: DWER Monitoring Bore AAMGL

Bore	Period of Record	Period for AAMGL Calc	2000-2023 AAMGL (mAHD)	2000-2023 MGL (mAHD)	GWL Average Annual Variation 2000-2023 (mAHD)	Estimated MGL 2024 (mAHD)	Difference to AAMGL (m)
HS73B	1983 - 2024	2000 – 2023	14.49	14.87	1.21	14.52	- 0.03

Table 3: Site AAMGL

Bore	MGL Aug/Sept 2024 (mAHD)	Correction Factor (m)	AAMGL (mAHD)
MW01	4.75	none	4.75
MW02	2.24		2.24
MW03	3.02		3.02
MW04	5.16		5.16
Ext 1	1.81		1.81
Ext 2	4.15		4.15
Ext 3	5.01		5.01

3.8 Nutrient Input Assessment & Existing Groundwater Quality

The Urban Nutrient Decision Outcomes (UNDO) model is a decision support tool developed by DWER that evaluates nutrient reduction decisions for urban developments on the Swan Coastal Plain in south-west Western Australia. It is designed for ease-of-use by urban development proponents and for assessment by local and state government authorities.

The tool was developed to assess the nutrient impact of urban development on the Swan Coastal Plain in a consistent and scientifically rigorous manner, and improve understanding relating to nutrient issues, and efficiencies in the investment to manage nutrients. The tool provides users with the ability to implement a range of structural or non-structural design options to evaluate and reduce nutrients exported from urban development.

Modelling inputs and outputs of the site's existing land use using UNDO are detailed in Appendix F. The results indicate nutrient inputs of 966 kg/yr of TN and 182 kg/yr of TP to the environment annually based on typical nutrient application rate estimates. The resultant nutrient export was 7.3 kg/yr of TN and 1.2 kg/yr of TP. These export estimate considers soil types, groundwater gradients, and depth to groundwater in its calculation.

Estimates of post development nutrient input and export are addressed in Section 7.3.

To establish a groundwater quality baseline, Hyd2o have commenced a predevelopment monitoring program, with groundwater quality sampling undertaken to date in May and August 2024. Each bore was analysed for physical parameters in the field and for nutrients and heavy metals (As, Cd, Cr, Cu, Ni, Hg, Pb and Zn) with samples sent to a NATA approved laboratory. Groundwater quality results are summarised below and detailed in Appendix G and H.

- pH ranged from 5.50 to 6.40 across the site indicating slightly acidic groundwater quality. The results fall outside the ANZECC (2000) guideline values for lowland river (6.5 – 8.0).
- Electrical Conductivity ranged from 0.25 to 1.02 mS/cm. The ANZECC (2000) guideline for EC ranges from 0.12 to 0.30 mS/cm.
- Mean Total Nitrogen calculated for each bore ranged from 0.20 to 6.90 mg/L. The upper mean exceeds the ANZECC (2000) guideline value of 1.2 mg/L.
- Mean Total Phosphorus concentrations for each bore showed values lower than laboratory detectable limit (0.05 mg/L) at all bores apart from Bore Ext 3 which showed a value of 0.09 mg/L, sitting outside the ANZECC (2000) guideline value of 0.065 mg/L.
- Filterable Reactive Phosphorus ranged from 0.005 to 0.028 mg/L across the site, below the ANZECC (2000) guideline value of 0.04 mg/L.
- With respect to heavy metals, the mean value for copper (Cu) at MW02 of 0.0019 mg/L slightly exceeded the ANZECC (2000) guideline value (0.0014 mg/L).

Overall groundwater quality was found to be consistent with the expected range of values for historically rural areas of the Swan Coastal Plain.

4. Design Criteria

Key design criteria for the site are shown in Table 4 and have been established consistent with criteria specified in the key reference documents detailed in Section 1.2. These design criteria are used to formulate the water management strategy for the site with the identified constraints and opportunities of the pre-development environment.

Table 4: Design Citeria

Strategy Elements	Criteria
Water Use Sustainability	
Water Efficiency	• Reduce consumptive use through adoption of waterwise practices.
Water Supply	• Develop "fit for purpose" water supply strategy, and minimise potable water use where drinking quality water is not essential.
Wastewater	• Provide a wastewater system which meets agency requirements.
Stormwater	
Flood Protection (1% AEP)	• Maintain existing flow paths for watercourses to downstream of the site. • Provide 1% AEP storage areas within the site for attenuation of local stormwater to allowable predevelopment rates. • Establish minimum habitable floor levels at 0.5m above the 1% AEP catchment flood levels and 0.3m above 1% AEP stormwater retention areas. • Provide flood paths for overland flows within the development area which exceed the capacity of piped drainage.
Serviceability (20% AEP)	• Road drainage system to be designed so that roads will be passable in the 20% AEP event. • Attenuation of local stormwater to allowable predevelopment rates.
Ecological Protection (15mm)	• 15mm event to be retained /treated on site. • Bioretention areas to provide water quality treatment for small event runoff. • Establishment of storage invert levels no lower than seasonal maximum groundwater levels to prevent nutrient export. • Implement non-structural controls.
Groundwater	
Fill Requirement & Subsoil Drainage	• Provide subsoil drainage to control post development groundwater rise • Establish development levels with acceptable clearance above post development groundwater levels.
Acid Sulphate Soils & Contamination	• If required, criteria and management of Acid Sulphate Soils to be handled as a separate process to LWMS consistent with DWER requirements.

5. Water Use Sustainability Initiatives

5.1 Water Efficiency Measures

Development of the site will lead to an increased demand for water for new residents as well as irrigation of public open space areas.

Water conservation measures will be implemented to reduce scheme water consumption within the development and will be consistent with Water Corporation's "Waterwise" land development criteria, and include:

- Promotion of waterwise practices including water efficient fixtures and fitting (taps, showerheads, toilets and appliances, rainwater tanks, landscaping).
- All houses to be built to 5 star building standards.
- Use of native plants in POS areas.
- Use of groundwater bores for irrigation of POS and common areas.
- Maximising on site retention of stormwater.

Landscape design will be based on "Waterwise" principles and detail the planting of native shrubs and trees indigenous to the local region. It is envisaged reticulation will utilise sub-surface drip lines to minimise evaporation.

Agreed water conservation measures and locations will be detailed in the UWMP.

5.2 Water Supply

Potable water supply to future homes in the site will be via extension of the Water Corporation's water supply system. Rainwater tanks are considered as a potential non-potable source to be integrated as part of the domestic water supply scheme and assist in reducing stormwater and minimising scheme water importation. Rainwater tanks will be encouraged among landowners but not mandated.

With respect to POS irrigation, the site is located within the Bunbury Groundwater Management Area, in which DWER's online Water Register for Licence and Water Availability Information indicates all three aquifers (Superficial, Leederville and Yarragadee) are fully allocated.

The site however has two existing groundwater licences (Appendix J):

- GWL 109152 held by Ardross Estates (S.A.) Pty Ltd with an allocation of 139,000 kL/yr from the Leederville aquifer.
- GWL 171479 held by the Shire of Dardanup, also with an allocation of 139,000KL from the Yarragadee aquifer.

Irrigation water for the site will be provided via extension of the existing Millbridge irrigation system to the site across Eaton Drive. Hyd2o understand conduits have previously installed for this purpose during the Eaton Drive scheme works. Correspondence with council regarding extension of the irrigation supply to the site are detailed in Appendix J.

An indicative POS landscape plan for the site is shown in Appendix J to demonstrate sufficient POS is allocated within the proposed development to manage stormwater. Further refinement of the POS design will be undertaken by project landscapers in

consultation with the Shire of Dardanup at UWMP stage. Key issues to be considered in the ultimate POS and stormwater storage design include:

- Ensuring any outlet pipe from the storage discharges downstream of any proposed pathways within the Kalgulup Regional Open Space
- An overflow spillway with erosion protection is provided to provide safe passage of flows in excess the 1% AEP event
- Further discussion and consideration with council regarding the use of a retaining wall on the eastern boundary of the POS area directly adjacent to a freehold lot.

5.3 Wastewater Management

Wastewater will be deep sewerage (reticulated) with management by Water Corporation.

6. Stormwater Management Strategy

Stormwater management is proposed to be undertaken consistent with DWER and Shire of Dardanup water sensitive urban design practices and utilised best management practices consistent with DWER's Stormwater Management Manual for WA (DWER,2022).

The system will consist of a series of lot soakwells, pipes, POS biofiltration areas, and ephemeral flood storage areas to attenuate peak surface water flows and provide water quality treatment for the proposed development.

Key elements of the system which are reflected in the structure plan include:

- Use of soakwells to maximise on site retention of stormwater at lot scale.
- Use of biofiltration systems in POS to treat and manage small event road runoff.
- Use of ephemeral stormwater detention areas in POS for flood storage and detention.
- Maintaining the existing regional surface water flow path post development.

6.1 Stormwater Modelling

Pre-development flow rates for the site to inform post development design were estimated using a range of methods to provide verification of estimates, including XP-Storm modelling, Australian Rainfall and Runoff's Regional Flood Frequency Estimation method (Ball et al, 2016) and applying the Rational and Flood Index Methods from previous version of AR&R. Various estimates and method outputs are provided in Appendix K. Methods were found for provide good general agreement and a flow rate of 0.36 m^3/s was adopted for post development design purposes for the 1% AEP event (Table 5).

Note the initial loss and continuing loss models applied were based on Australian Rainfall and Runoff's Datahub which recommended a 26mm initial loss and a 4mm /hr continuing loss. The estimated predevelopment rate of 28 l/s/ha using these values is considered to represent a typical pro rata flow rate for a catchment of this nature.

Table 5: XP-Storm Modelling Parameters to Estimate Pre-Development Flow

Model Parameter	Value
Land Use	Pasture
Contributing Catchment Area (ha)	12.71
Pervious Initial loss (mm)	26.0
Pervious Continuous Loss (mm/hr)	4.0
Slope (%)	1.6
1% AEP Pre Development Flow Estimate (adopted via XP-Storm)	0.36 m^3/s

Post development stormwater modelling for the site was performed using XP-Storm to determine flood storage requirements and provide an assessment of local structure plan areas required for drainage purposes. The storage area was designed to be ephemeral and contain runoff from the 20% and 1% AEP storm events, with discharge for the 20% and 1% AEP events designed not to exceed pre development flow requirements. The storage location was determined based on existing topographic contours, depth to groundwater mapping, and the POS/drainage area specified in the local structure plan.

The storage area invert for this modelling was established above the AAMGL, which effectively represents the controlled groundwater level (CGL) for the site. Adoption of the AAMGL as the CGL will avoid any draining of regional groundwater below this level.

The design storms modelled by XP-Storm were calculated internally by the model with reference to the methodology in Australian Rainfall & Runoff (AR&R) (Institution of Engineers, Australia 2000) and the Bureau of Meteorology Computerised Design IFD Rainfall System. The rainfall temporal pattern was assumed to be spatially uniform across the catchment. Storm durations modelled ranged from 30 minutes to 72 hours.

Hyd2o's CURRV runoff rate calculator was used to estimate suitable post development runoff rates (Appendix L). Hyd2o's CURRV runoff calculator is a standardised approach used by Hyd2o across all development projects to estimate runoff rates. In estimating runoff rates CURRV considers rainfall IFD's, land use breakdown, percentages of impervious and pervious areas within land use type and likely initial and continuing loss of soil types. Importantly it also considers Book 5 Chapter 3 of Australian Rainfall and Runoff (Ball, et al 2106), which details the relationship between Effective Impervious Area (EIA) and Total Impervious Area (TIA) and considers the different behaviour in runoff that occurs from areas which are directly connected and those impervious areas which are only indirectly connected. Research has found the Effective Impervious Area is typically in the range of 55-65% of TIA for Australian catchments.

6.2 Flood Protection (1% AEP)

Modelled detention storage volumes, areas, flood rise and inverts are detailed in Table 6 and Figure 8 for the 1% AEP flood event, showing the extent of inundation of POS/ROS area for major event flood management. Figure 8 also shows the flow paths along roads for overland conveyance to the POS for storm events which exceed the capacity of the piped drainage system. Detailed modelling outputs are contained in Appendix M.

The total area required for detention storage for the 1% AEP event is approximately 0.24 ha with a total detention storage volume of approximately 1935 m^3.

Storage shapes shown in Figure 8 are indicative only for determination of area requirements, and representation of storage areas required in relation to POS areas allocated in the structure plan. The final flood attenuation area configuration (side slopes etc) will be documented in UWMP's and will be dependent on final earthworks, drainage, and road design levels for the development. Minor changes (refinements) in catchment areas shown in this report may occur as detailed design proceeds, and stormwater modelling will be updated accordingly during the UWMP process.

Minimum habitable building floor levels (Appendix M) will comply with requirements for a 0.5 m clearance above estimated 1%AEP flood levels for the local system and Collie River.

Table 6: Flood Attenuation Storages

Storage Configuration	
Regional AAMGL (m AHD)	3.00
Storage Invert (mAHD)	3.30
Base Area (m^2)	900 @3.3mAHD 1485 @3.6mAHD
Side Slopes (v:h)	0 @3.3mAHD 0 & 6 @3.6mAHD
Outlet Pipe Diameter (mm) (nominal size only to limit flow to predev)	400
Outlet Pipe Invert (mAHD)	3.6
1% AEP Event Flood Storage	
Top water level surface area (m^2)	2438
Volume (m^3)	1935
Flood rise above Invert (m)	1.16
Outflow (m^3/s)	0.33
Critical Storm (hr)	1
20% AEP Event Flood Storage	
Top water level surface area (m^2)	1793
Volume (m^3)	767
Flood rise above Invert (m)	0.61
Outflow (m^3/s)	0.14
Critical Storm (hr)	3
15mm Biofiltration Storage	
Top water level surface area (m^2)	900
Volume (m^3)	263
Flood rise above Invert (m)	0.29

6.3 Serviceability (20% AEP Event)

Modelled detention storage volumes, areas, flood rise, and inverts are detailed in Table 6 and Figure 8 for the 20% AEP flood event, showing the extent of inundation of POS area for serviceability requirements. The total area required for detention storage for the 20% AEP event is 0.18 ha with a total detention storage volume of approximately 754 m^3.

6.4 Ecological Protection (15mm Biofiltration)

The storm volume for ecological protection based on 15mm event has been provided in Table 6 to provide a guide for storage requirements and areas for water quality treatment consistent with DWER requirements.

Biofiltration basins are engineered to capture and facilitate the infiltration of stormwater runoff from roadways during small rainfall events. These areas are typically constructed with amended soil and are vegetated with water-tolerant species to provide effective water quality treatment. Generally, biofiltration basins are designed to be approximately 0.3 meters in depth, and provide treatment for over 95% of the annual runoff volume from the road reserves within a development area.

Further specific details of 15 mm treatment measures and their design will be contained in the UWMP. Volumes will be refined at UWMP stage on the basis of more detailed modelling in parallel with engineering design.

Table 7 details a summary from DWER's Stormwater Management Manual for Western Australia (2022) of expected pollutant removal efficiencies for various WSUD measures in relation to water quality design criteria.

While DWER (2022) does not provide expected pollutant removal efficiencies for all BMP's, application of a treatment train approach and combination of measures will achieve post development design objectives for water quality for the site.

Table 7: BMP Water Quality Performance in Relation to Design Criteria

Water quality parameter	Design criteria via WAPC (2008) (required removal as compared to a development with no WSUD)	Structural controls nutrient output reduction [1]	
		Bioretention systems	Detention/ retention storages
Total Suspended Solids	80%	60-80%	65-99%
Total Phosphorus	60%	30-50%	40-80%
Total Nitrogen	45%	25-40%	50-70%
Gross Pollutants	70%	-	>90%

1. Typical Performance Efficiencies via DWER (2022)

7. Groundwater Management Strategy

7.1 Fill and Subsoil Drainage

Engineering earthworks plans are contained in Appendix O. Development levels in the site will be largely dominated by fill requirements to achieving adequate separation to groundwater. With the exception of the southern portion, the remainder of the site will be subject to fill.

Minimum separation between building floor levels for development and groundwater will be achieved by a combination of fill and subsoil drainage to provide protection against any post development groundwater rise. All subsoil drainage is proposed to be located at or above the AAMGL as a control groundwater level, with lots providing a minimum 1.5 m clearance above the invert of the subsoil drains.

In very broad terms, fill in the order of 1.5m is likely to be required in existing low lying areas, ranging to no fill being required on the southern side of the site where the groundwater clearance to AAMGL exceeds 1.5m.

All subsoil drainage will be free draining in accordance with IPWEA and subdivisional guideline requirements and will discharge to the POS biofiltration area for water quality treatment. The proposed basin will also have subsoil to ensure its function prevent long term ponding o water with the biofiltration and POS areas. Detailed site subsoil plans will be provide to council with engineering drawings a UWMP stage.

Finished lot levels and fill requirements are a detailed design issue to be addressed during the preparation of detailed engineering design drawings and preparation of the UWMP and will be ultimately submitted for council approval at that stage.

7.2 Acid Sulphate Soils

As mentioned in Section 4.3, majority of the site is classified as having a moderate to low risk of ASS occurring less than 3m from surface, with high to moderate risk observed in the northern corners along the site boundary (Figure 4). Management of ASS will be addressed by a separate study to this LWMS depending on excavation depths for engineering services. All assessment and management of ASS will be undertaken in compliance with DWER guidelines.

Details regarding the outcomes of ASS studies will be included as part of the UWMP.

7.3 Nutrient Management

Post development UNDO modelling of the site is detailed in Appendix N, showing the change with respect to nutrient application and export from the site compared to existing conditions.

Modelling was performed on the local structure plan in Figure 2. The modelling indicates land use change will result in nutrient inputs of 1066 kg/yr for TN and 236 kg/yr TP post development. The resultant nutrient export following water sensitive urban design implementation is reduced to 7.0 kg/yr export of TN and 1.5 kg/yr export for TP. These rates are effectively similar to the pre development nutrient export estimates of 7.3 kg/yr TN and 1.2 kg/yr TP.

8. Urban Water Management Plans

Consistent with processes defined in WAPC (2008), UWMP's will be developed and submitted to support subdivision applications for various stages of development within the site. UWMP's will address:

- Demonstrated compliance with LWMS criteria and objectives to the satisfaction of the Shire of Dardanup and DWER.
- Agreed/approved measures to achieve water conservation and efficiencies of water use.
- Detailed stormwater management design including the size, location and design of public open space areas, integrating major and minor flood management capability.
- Management of groundwater levels including proposed fill levels and subsoil drainage inverts.
- Specific structural and non-structural BMPs and treatment trains to be implemented including their function, location, maintenance requirements, expected performance and agreed ongoing management arrangements.
- Management of subdivisional works including development of a strategy for sediment control during construction.
- Implementation plan including roles, responsibilities, funding and maintenance arrangements.
- Specific monitoring and reporting to be undertaken post development.
- Contingency plans (where necessary).

More detail of POS and drainage integration will be provided during the development of the UWMP, including refinement of stormwater modelling, preparation of more detailed landscape plans (species selection and treatments), and detailed engineering design drawings.

Preparation of the UWMP will be the developers' responsibility.

9. Monitoring

9.1 Pre Development

Hyd2o commenced a pre development monitoring program in May 2024 which is currently ongoing and scheduled for completion in November 2025.

The monitoring undertaken by Hyd2o will continue to establish a baseline groundwater hydrological conditions for the site and will be used to inform the development of future UWMP's and engineering design.

9.2 Post Development

An indicative post development monitoring program and parameters for the site is detailed in Table 8.

Monitoring locations are expected to be in proximity to predevelopment monitoring sites and will be identified at UWMP stage, with locations also dependent on staging of works. Specific targets will be determined following the completion of the predevelopment monitoring program and appropriate detailed at UWMP stage.

The monitoring program is designed to operate over a three year post development period. The timing of commencement of the monitoring program for individual subdivision areas will be negotiated at UWMP stage with DWER and Shire of Dardanup.

The program may need to be modified as data are collected to increase or decrease the monitoring effort in a particular area or to alter the scope of the program itself. Any modification to the program would be identified through review of the collected data and would require the agreement of all parties (DWER, Shire, and the developer).

All water quality testing will be conducted by a NATA approved laboratory.

Based on monitoring outcomes, a contingency action plan is shown in Table 9.

Table 8: Monitoring Schedule

Monitoring	Parameter	Location	Method	Frequency and Timing
Groundwater	Level	To be identified at UWMP stage dependent on staging.	Electrical Probe	Quarterly (4 times per year) for 3 years.
	pH, EC, TSS Nitrogen Phosphorus		Pumped Sample	
Local Stormwater	Flow Rate	Stormwater basin inlet and outlet	Visual estimate	Monthly sampling when flowing, typically June to October (5 times per year) for 3 years.
	pH, EC, TSS Nitrogen Phosphorus		Grab sample	
Regional Surface Water	pH, EC, TSS Nitrogen Phosphorus	Collie River adjacent to site	Grab sample	

Table 9: Contingency Planning

Type	Criteria for Assessment	Frequency	Process & possible actions
Water Quality	Surface and groundwater quality from the site significantly greater than: a) predevelopment water quality; and/or b) typical urban stormwater quality on the Swan Coastal Plain (Martens et al 2004) TN: 1.1 mg/l TP: 0.21 mg/l with reference to ANZECC guidelines [1]	Annual Review	**Process** 1. Assess spatial extent of occurrence. 2. Determine if due to development or other factors. 3. Perform appropriate action as required (refer below) 4. Record and report any breach and action taken. 5. If necessary, inform residents of any required works. 6. Inform and provide monitoring data to DWER/Shire of Dardanup. **Possible Actions** 1. Identify and remove point sources of pollution. 2. Review operational and maintenance practices. 3. Consider alterations to POS areas including landscape regimes and soil amendment. 4. Consider modifications to the stormwater system. 5. Consider initiation of community-based projects.

1. ANZECC guidelines to be used as a reference point only. ANZECC guidelines state that guidelines values are not intended to be directly applied to stormwater quality, however, are applicable where the stormwater system are regarded as having conservation value. ANZECC guideline values are derived for unmodified or slightly modified ecosystems. ANZECC recommends the values only be applied where site specific values do not exist, or site-specific targets cannot be derived.

10. Implementation

This LWMS will be implemented by the developer, the Shire of Dardanup and the DWER based on the roles, responsibilities and funding detailed in this LWMS.

Monitoring outcomes will be used in a continual improvement capacity to review the implemented WSUD within the site and inform the planning and design approaches for subsequent stages of development. Any modification required to the LWMS would be identified through the review process of monitoring data and would require the agreement of all parties (DWER, Shire, and developer).

Details of implementation responsibilities are shown in Table 10 with a schedule for typical maintenance works shown in Table 11.

These responsibilities will be further appropriately refined at UWMP stage.

Table 10: Implementation Responsibilities

		Responsibility & Funding	
LWMS section	**Implementation Action**	**Developer**	**Shire and DWER**
Urban Water Management Plans			
8	Preparation of a UWMP for individual development stages	☑	
8	Review & approval of UWMPs		☑
Monitoring Program			
9	Post Development Monitoring Program	☑	
Stormwater System			
-	Construction within the site	☑	
-	Operation & Maintenance a) Prior to Handover b) Following Handover	☑	☑

Table 11: Typical Maintenance Schedule for Drainage Infrastructure

Item	Minimum Maintenance Interval		
	Quarterly	Biannually	As required
Street drainage			
Street sweeping to reduce particulate build up	☑		
Reduction of sediment and rubbish in manholes			☑
Removal of debris to prevent blockages			☑
Checks on subsoil drainage function		☑	
Stormwater detention & bioretention areas			
Inspect for erosion + sediment accumulation		☑	
Assess health of vegetation and replace where necessary	☑		
Remove sediment and leaf litter layer build up.			☑

11. References

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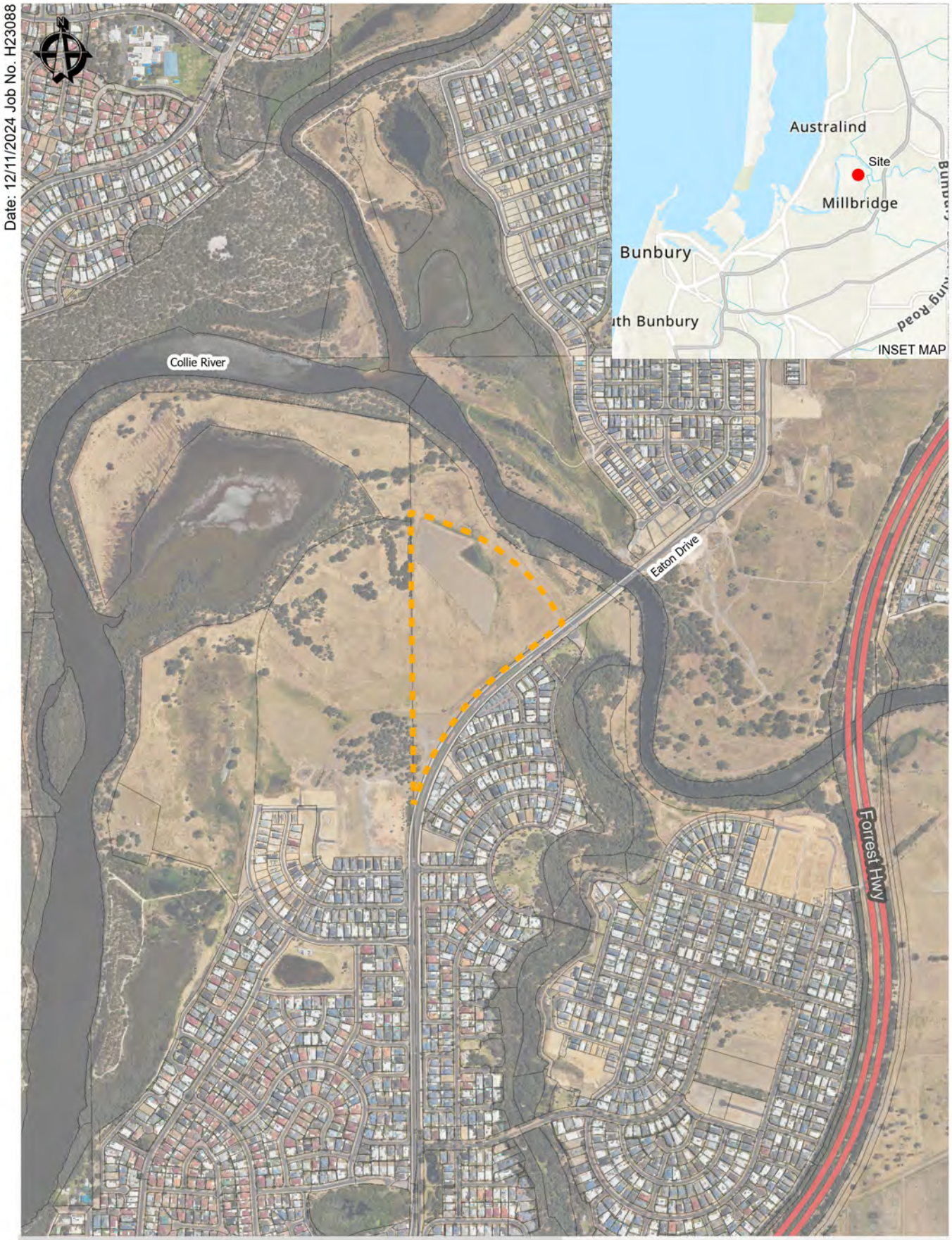
(Appendix ORD: 12.2.3A)

FIGURES



hyd2o

Lot 3001 Eaton Drive Eaton
Local Water Management Strategy

Location Plan

Figure 1

Date: 12/11/2024 Job No. H23088

LEGEND

TOTAL APPLICATION AREA (18.9177ha)

PROPOSED BIN PADS FOR LOTS 95, 96, 102 & 103

SERVICES

WATER

PIPE

SEWER

CONNECTION

GRAVITY PIPE

PRESSURE MAIN

ELECTRICAL

UNDERGROUND DISTRIBUTION LINE

DISTRIBUTION POLE/LIGHT POLE/PILLAR

LOT SUMMARY

LOT YIELD			LOT AREA	
Size	No. Lots	% Total Lots	Average Size	% of Total Area
500m² - 549m²	3	2.50%	529m²	1.67%
550m² - 599m²	2	1.67%	573m²	1.21%
600m² - 699m²	60	50.00%	633m²	40.12%
700m² - 799m²	28	23.33%	735m²	21.72%
800m² - 899m²	12	10.00%	839m²	10.62%
900m² - 999m²	10	8.33%	939m²	9.91%
1000m² - 1499m²	4	3.33%	1115m²	4.71%
1500m² +	1	0.83%	9516m²	10.04%
Number of Lots	120			
Minimum Lot Size 505m² Maximum Lot Size 9516m²			Average Lot Size 789m² Total Lot Area 94779m²	
Kalgulup Regional Park	1			
Total Number of Lots	121			

POS
(Kalgulup Regional Park)
5.1375ha

3100
18.9177ha

POS &
DRAINAGE
1.1883ha

120
(Grouped Housing)
9516m²

APPROVED PARKRIDGE
STRUCTURE PLAN
LAYOUT (2019)

ROAD 1 (18m ROAD RESERVE)
ROAD 2 (15m)
ROAD 3 (15m ROAD RESERVE)
ROAD 4 (18m ROAD RESERVE)
ROAD 5 (15m)
ROAD 6 (15m ROAD RESERVE)
ROAD 7 (15m ROAD RESERVE)
ROAD 8 (15m ROAD RESERVE)
ROAD 9 (12m)

EATON DRIVE

Collie River

Plan of Subdivision - Freehold

LOT 3001 EATON DRIVE, EATON

An Ardross Estates Project

DRAFT

plan: 17/079/018A
date: 14/06/2024
designed: BDM
scale: 1:3000@A3 | 1:1500@A1
grid: PCG 94
checked: BDM
0 30 60m
aerial: -
drawn: JB

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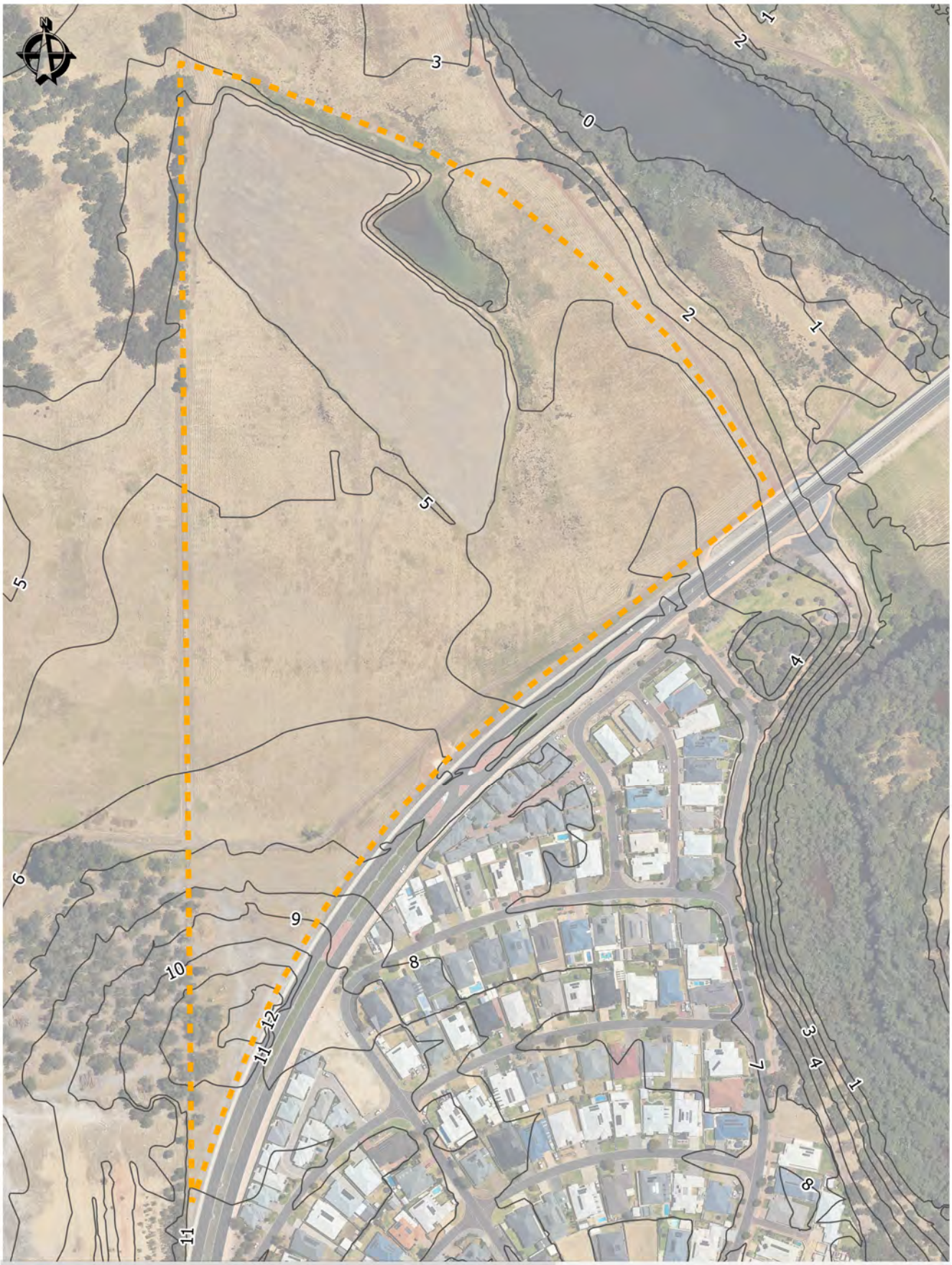
ALL AREAS AND DIMENSIONS SUBJECT TO FINAL SURVEY

Taylor Burrell Barnett

Date: 12/11/2024 Job No. H23088

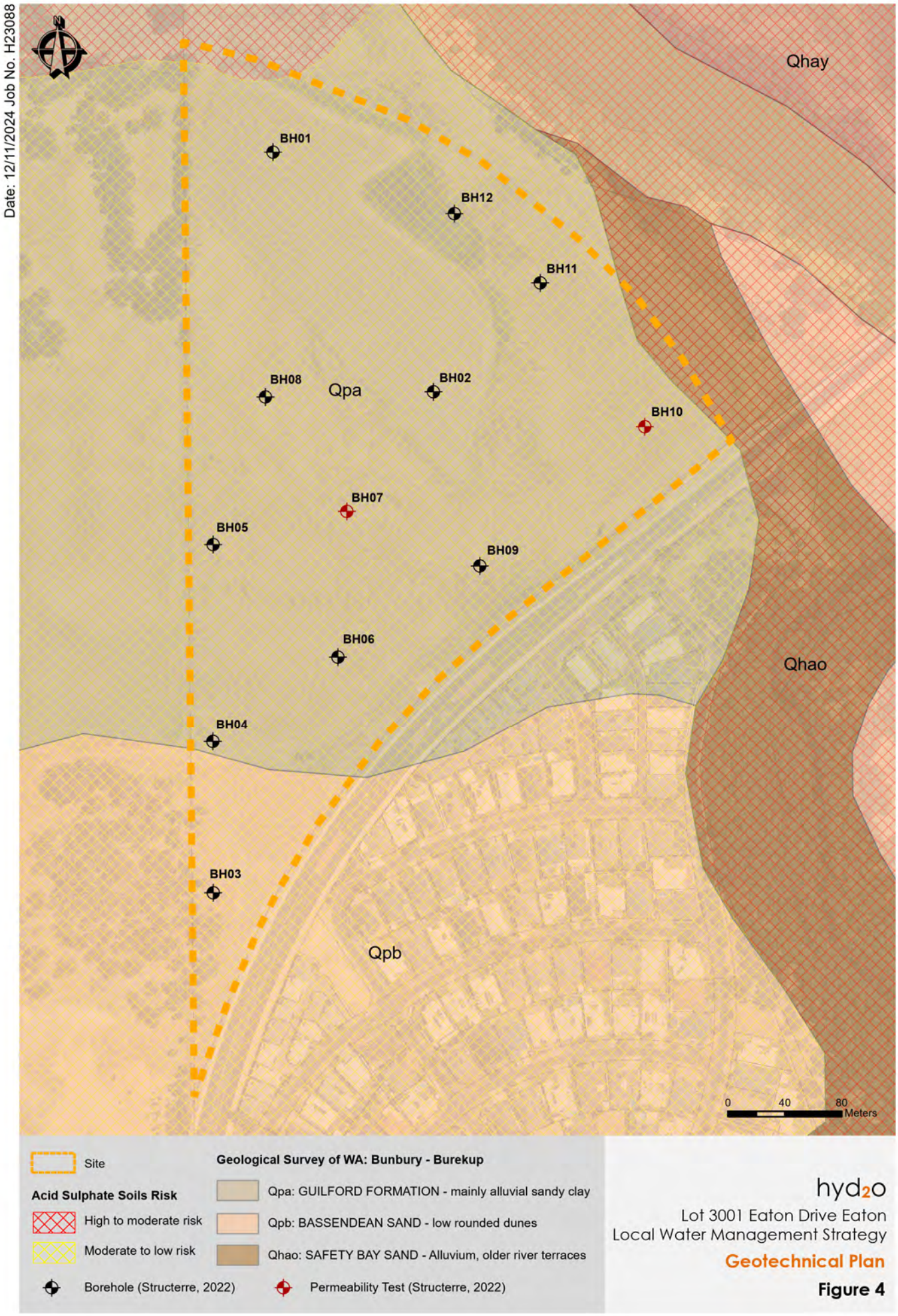


hyd2o

Lot 3001 Eaton Drive Eaton
Local Water Management Strategy

Site Conditions Plan

Figure 3

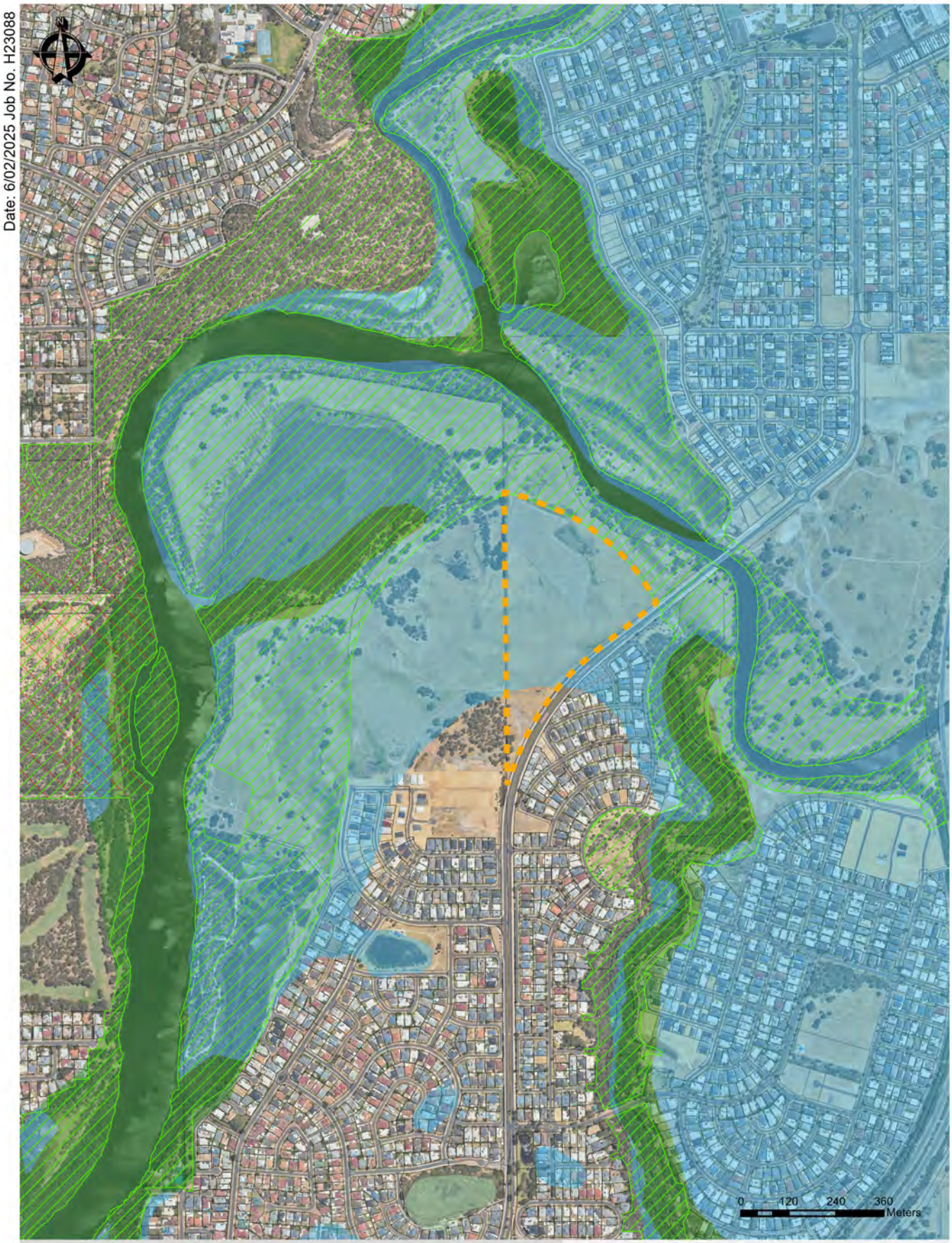


hyd2o

Lot 3001 Eaton Drive Eaton
Local Water Management Strategy

Geotechnical Plan

Figure 4



hyd2o

Lot 3001 Eaton Drive Millbridge
Local Water Management Strategy

Environmental Plan

Figure 5

Date: 12/11/2024 Job No. H23088

Site

Existing Drain

Hydrography

Collie River

Millars Creek

FPM 1% AEP Floodway

FPM 1% AEP Flood Fringe

FPM 1% AEP Flood Level Contours mAHD

0 70 140 Meters

Source of Data:
SLIP Public Services Water (DWER-014, DWER-018, DWER-031)

hyd2o

Lot 3001 Eaton Drive Eaton
Local Water Management Strategy

Surface Water Plan

Figure 6

Date: 16/01/2025 Job No. H23088

Site
LiDAR Contours (mAHD)
Groundwater Monitoring Bores
DWER Groundwater Bores
AAMGL Contours (mAHD)

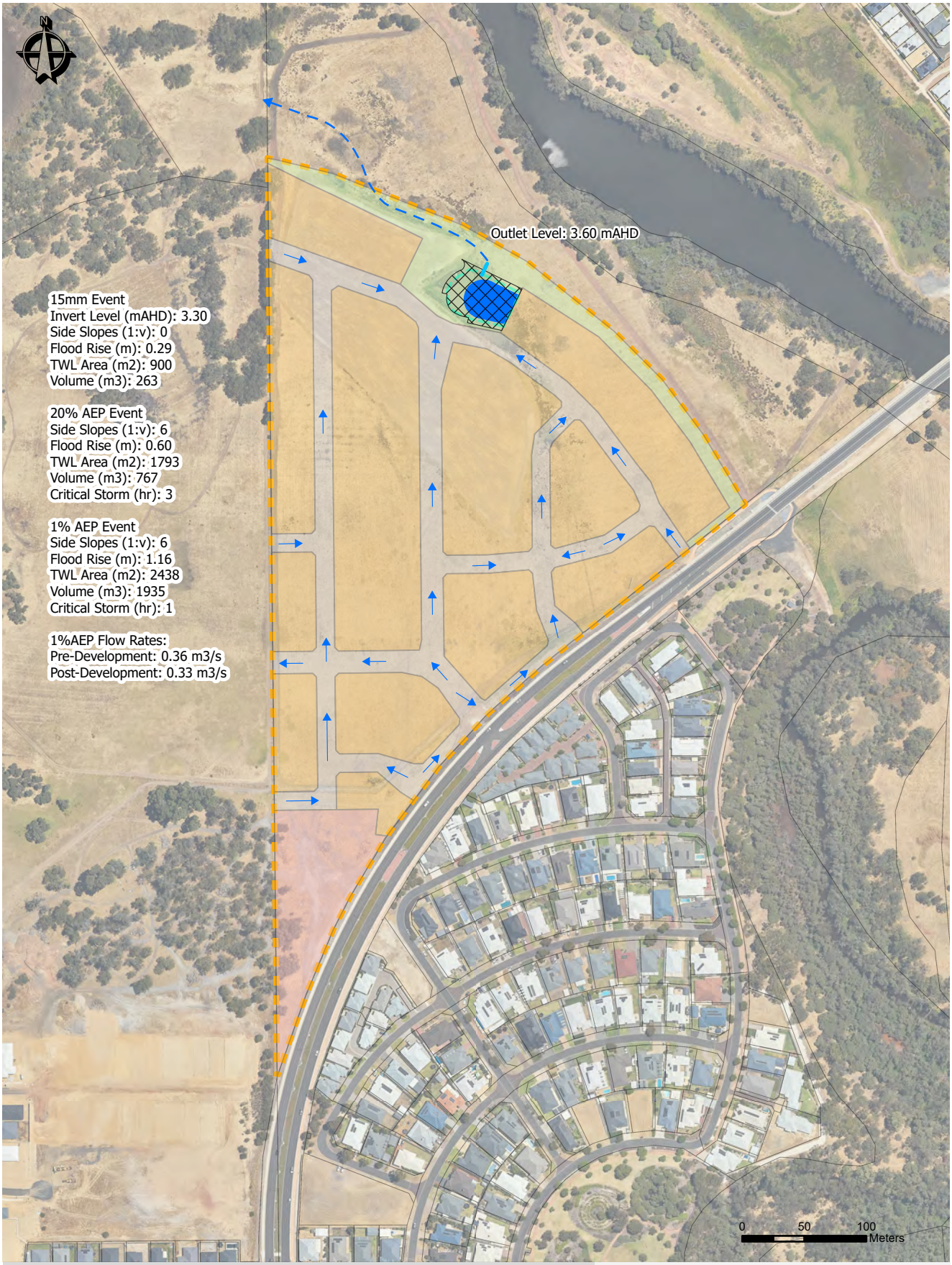
hyd2o

Lot 3001 Eaton Drive Eaton
Local Water Management Strategy

Groundwater Plan

Figure 7

Date: 30/01/2025 Job No. H23088



Site
1% AEP Storage
20% AEP Storage
15mm Biofiltration Basin
Lots
POS
Road
Grouped Housing
External Flow Pathway
Internal Flow Direction
Outlet Pipe

hyd2o

Lot 3001 Eaton Dr Eaton LWMS

Stormwater Management Plan

Figure 8

APPENDIX A

LWMS Checklist for Developers

Better Urban Water Management LWMS Checklist

Local Water Management Strategy Item	Deliverable	✓	Comments
Executive summary			
Summary of the development design strategy, outlining how the design objectives are proposed to be met	Design elements and requirements for BMP's and critical control points	☑	Executive Summary & Section 4
Introduction			
Total water cycle management - principles and objectives Planning background Previous studies		☑	Introduction, Sections 1.1 & 1.2
Proposed development			
Structure plan, zoning and land use Key landscape features Previous land use	Site Context Plan Structure plan	☑	Section 1, 2, & 3. Figure 1, Figure 2, Figure 3
Landscape - proposed POS areas, POS credits, water source, bore(s), lake details (if applicable), irrigation areas	Landscape plan	☑	Stormwater Areas and Volumes to inform POS credits in Section 6 & Figure 8. Water availability identified in Section 5.2.
Design criteria			
Agreed design objective and source of objective		☑	Section 4
Pre-development environment			
Existing information and more detailed assessments (monitoring). How do the site characteristics affect the design?		☑	Section 3 & Figures 3-7
Site conditions- existing topography/ contours, aerial photo underlay, major physical features	Site condition plan	☑	Section 3.1, Figures 1 & 3
Geotechnical - topography, soils including acid sulfate soils and infiltration capacity, test pit locations	Geotechnical plan	☑	Section 3.2, Figure 4. Geotechnical Investigation in Appendix B. Bore Logs in Appendix C
Environmental- areas of significant flora and fauna, wetlands and buffers, waterways and buffers, contaminated sites	Environmental plan plus supporting data where appropriate	☑	Sections 3.3-3.5, Figure 5.
Surface water- topography, 100 year floodways and flood fringe areas, water quality of flows entering and leaving (if applicable)	Surface water plan	☑	Section 3.6, Figure 6. Pre Development Flow Rates Calculation in Appendix K
Groundwater - topography, pre development groundwater levels and water quality, test bore locations	Groundwater plan plus details of groundwater monitoring and testing	☑	Section 3.7, Figure 7. Groundwater Level Site Report in Appendix D, Groundwater Quality Results in Appendix G
Water use sustainability initiatives			
Water efficiency measures- private and public open spaces including method of enforcement		☑	Section 5.1
Water supply (fit- for-purpose strategy), agreed actions and implementation. If non-potable supply, support with water balance		☑	Section 5.2
Wastewater management		☑	Section 5.3
Stormwater management strategy			
Flood protection - peak flow rates, volumes and top water levels at control points, 100 year flow paths and 100 year detentions storage areas	100yr event plan Long section of critical points	☑	Section 6 & 6.1-6.3, Figure 8
Manage serviceability - storage and retention required for the critical 5 year ARI storm events Minor roads should be passable in the 5 year ARI event	5yr event plan	☑	Section 6 & 6.1-6.3, Figure 8
Protect ecology - detention areas for the 1 yr 1 hr ARI event, areas for water quality treatment and types of (including indicative locations for) agreed structural and non-structural best management practices and treatment trains. Protection of waterways, wetlands (and their buffers), remnant vegetation and ecological linkages	1 yr event plan Typical cross sections	☑	Section 6 & 6.1 & 6.3 Figure 8

Local Water Management Strategy Item	Deliverable	✓	Comments
Groundwater management strategy			
Post development groundwater levels, fill requirements (including existing and likely final surface levels), outlet controls, and subsoil areas/exclusion zones	Groundwater/subsoil plan	☑	Section 7 Note : Subsoil plan to be provided at UWMP stage
Actions to address acid sulphate soils or contamination		☑	Section 7
The next stage - subdivision and urban water management plans			
Content and coverage of future urban water management plans to be completed at subdivision. Include areas where further investigations are required prior to detailed design		☑	Section 8
Monitoring			
Recommended future monitoring plan including timing, frequency, locations and parameters, together with arrangements for ongoing actions		☑	Section 9
Implementation			
Developer commitments		☑	Section 10
Roles, responsibilities, funding for implementation		☑	Section 10
Review		☑	Section 10

APPENDIX B

Geotechnical Investigation

(Appendix ORD: 12.2.3A)

Doc GE2.1.2

GEOTECHNICAL INVESTIGATION

For: Ardross Estates (S.A.) Pty Ltd

Project Address: Lot 3001 Eaton Drive, Eaton WA

Project Number: D300515

Job Number: J416957

Revision Number: 0

Date: 28/9/2022

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ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

1. PROJECT DETAILS

1.1. Introduction

At the request of Ardross Estates (S.A.) Pty Ltd, Structerre Consulting (Structerre) have conducted a Geotechnical Investigation at Lot 3001 Eaton Drive, in Eaton WA. The purpose of the investigation was to provide the following:

- An assessment of subsurface soil profile and groundwater conditions across the proposed area of development;
- Site classification in accordance with AS 2870-2011 Residential Slabs and Footings;
- Wind Classification in accordance with AS 4055-2012 Wind Loads for Housing;
- Recommendations for stormwater drainage design;
- Recommendations on earthworks and site preparation; and
- Provision of a footing detail considering anticipated surface movement and sand pad thickness.

Terms of reference for this investigation were presented in a Structerre Consulting proposal reference Q97293 (dated 5 August 2022), which was submitted to and accepted by Ardross Estates (S.A.) Pty Ltd.

1.2. Site Description

The site is located at Lot 3001 Eaton Drive, Eaton, Shire of Dardanup. Eaton Drive lies to the east and southeast of the site, Kalgulup Regional Park and Collie River to the north and northeast and vacant rural property to the west.

The site slopes down towards the north and northeast boundary. At the time of the field investigation, the site was vacant and covered in grass with small to medium sized trees. There was a raised area (fill) at the location of BH1 & BH2. A dam was also noted at the same location.

1.3. Field Investigation – Scope of Works

The field investigation was carried out on 24 August 2022 and comprised:

- 12 x Sample Retrieval Probes (SRP) to a depth of 3.5m over the site for material assessment and soil profiling;
- 2 x In-situ percolation tests to determine the permeability of the materials within the upper 1.0m; and
- 6 x Dynamic Cone Penetrometer (DCP) tests in accordance with AS 1289.6.3.2 (1997) to a depth of 1.0m for evaluation of relative densities of the upper layers.

The borehole test locations are shown on the attached site plan in Appendix 1.

Suitably qualified geotechnical personnel from Structerre supervised the fieldwork and all fieldwork, interpretation and terminology used in this report are in accordance with the guidelines presented in AS1726-2017 Geotechnical Site Investigations.

2. DESK STUDY

2.1. Geological Setting

The Collie sheet 1: 250,000 Environmental Geology Series (Sheet SI 50-6, 1983) prepared by the Geological Survey of Western Australia indicates that the following geological layers underlie the site:

- Qpb/Qpa – Bassendean Sand, thin veener over Guildford Formation.
- ALLUVIUM – clay, sand and loam (Q_{rg}).

2.2. Ground Surface and Groundwater Level

The Landgate website indicates the ground surface level at this site was approximately 5.0m – 10.0m Australian Height Datum (AHD).

No published groundwater information available for the site.

2.3. Earthquake Coefficient

In accordance with AS 1170.4-2007 Structural Design Actions the site is located within an area with an earthquake acceleration coefficient of 0.09.

2.4. Wind Classification

In accordance with AS 4055-2012 Wind Loads for Housing, wind classification of this site falls within the non-cyclonic “N2” category.

3. RESULTS OF THE INVESTIGATION

3.1. Subsurface Soil Profile

The subsurface soil profile presented below was determined from the ground conditions encountered within the boreholes and through the interpretation of the DCP test results:

Table 1 – Subsurface Soil Profile

Depth to Base of Strata (m)	Material Description
0.1 – 0.2 (Ave. 0.2)	Topsoil
0.2	NATURAL: Clayey SAND (fine to medium grained), low plasticity, trace gravel, very loose grading to dense – BH7 and BH9 to BH12 only
1.2 – 2.0 (Ave. 1.6)	FILL: SAND (fine to medium grained), non-plastic, loose grading to medium dense – BH1 and BH2 only
1.2 – 3.5 (Ave. 2.4)	NATURAL: SAND (fine to medium grained), non-plastic, loose grading to medium dense – BH3 and BH4 only
Not Penetrated (>3.5m)	NATURAL: Sandy CLAY (fine to medium grained), medium plasticity, trace gravel, very soft grading to stiff

The soils encountered are consistent with the expected site conditions as predicted from the Environmental Geology Map. It is important to note that there may be pockets of fill on site that are deeper than that encountered by the investigation boreholes. The subsurface soil conditions encountered are presented in the bore logs, within Appendix 3.

3.2. Groundwater

Groundwater was encountered in the following borehole locations during or immediately after drilling and are summarised below:

Table 2 –Groundwater

Test Location	Depth from Natural Ground Level
BH7	1.7m
BH8	1.8m
BH9	1.5m

3.3. Percolation Testing

Percolation testing of the in-situ soils was undertaken in two locations. Results of the testing are summarised below:

Table 3 – In Situ Percolation Test Results

Test Location	Testing Depth	Soil Type	Permeability
BH7	0 - 1.0m	Clayey SAND trace gravel	Not obtainable due to water table encountered
BH10	0 - 1.0m	Clayey SAND trace gravel	1.0m/day

3.4. Laboratory Test Results

Selected soil samples were tested for Atterberg Limits.

3.4.1. Atterberg Limits

Atterberg Limits were tested by Structerre's in-house NATA accredited laboratory. Results of the testing are summarised below:

Table 4 – Atterberg Limit Test Results

Sample	Test Hole	Depth (m)	Soil Description	Liquid Limit % AS1289 3.1.2	Plastic Limit % AS1289 3.2.1	Plasticity Index % AS1289 3.3.1	Linear Shrinkage % AS1289 3.4.1
1	BH5	0.2-1.1	Sandy CLAY trace gravel	41	18	23	6
2	BH7	0.2-1.7	Clayey SAND trace gravel	34	17	17	9

Test results indicate that the natural sandy CLAY and clayey SAND has low to moderate shrink swell capacity or degree of expansion.

A copy of the results are presented in Appendix 4.

4. GEOTECHNICAL CONSTRUCTION CONSIDERATIONS

4.1. Site Classification

AS 2870-2011 Residential Slabs and Footings provides guidance on site classification for residential slabs and footing design based on the expected ground surface movement and depth of expected moisture changes.

Table 5 – Classification Based on Site Reactivity

AS 2870-2011 Residential Slabs and Footings - Clause 2.1.2 Table 2.1	
Class	**Foundation**
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes (0<ys≤20mm)
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes (20<ys≤40mm)
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes (40<ys≤60mm)
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes (60<ys≤75mm)
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes (ys>75mm)
Clause 2.1.3 Classification of other Sites	
P	Sites which include soft or unstable foundations such as soft clay or silt or loose sands, landslip, mine subsidence, collapsing soils and soils subject to erosion, reactive sites subject to abnormal moisture conditions and site that cannot be classified in accordance to Table 2.1

Based on results of this investigation the majority of the site would be classified Class “S to M” with the exception of a small area of natural sand within the south western corner of the site which can achieve Class “A”. The remainder of the site can be upgraded to Class “S” in accordance with AS 2870-2011 provided that all unsuitable materials are removed and replaced with engineer-controlled sand fill materials in accordance with the earthwork recommendations outlined in Section 4.3 of this report.

Footings suitable for this site should be adopted to accommodate expected ground surface movements of approximately y_s < 10mm associated with the presence of low to moderately reactive CLAY deposits underlying the site.

4.2. Drainage

The existing ground conditions are not suitable for on-site disposal of stormwater runoff through the use of soakwells. It is recommended that all stormwater from roofed, paved and driveway areas be collected and detained to reduce peak flow rates prior to discharging off site as per council requirements. Sub soil drainage may be required at this site to control ground water perching in the upper soil layers.

Onsite disposal of stormwater can be considered subject to providing a minimum free draining sand cover of 1.5m or greater above the reactive clay soils.

4.3. Earthworks

All earthworks shall be undertaken in accordance with AS 3798-2007 Guidelines on earthworks for commercial and residential developments and are to include the following:

- All unsuitable materials to be stripped and removed from the site. Unsuitable materials include topsoils, deleterious and organic materials.
- It is considered that the near surface material will require improvement. Therefore, it is proposed to strip and remove all topsoils from the site prior to proof rolling the stripped surface.
- The stockpiled sand (located in the vicinity of BH1 and BH2) is considered suitable for reuse as structural filling, therefore it is proposed to cut this material allowing a remaining thickness of 0.6m over the clay base (subject to final design levels). The won material from the cut can be reused as structural fill over the stripped clay areas after proof rolling.
- Once stockpiled sand materials have been cut down, the remaining insitu sand fill can be proof compacted prior to filling over. The depth of excavation may vary depending on conditions encountered and is subject to inspection.
- Excavations for services should not be greater than 1.2m and/or undermine any surrounding structures without the appropriate benching or shoring. A 1V: 2H slope should be maintained for temporary excavations. If excavation is required closer than the 1V: 2H slope would allow or deeper, it is recommended that this office be contacted for retaining system design.
- Proof compact the exposed base. The compaction requirements are set out in the table below, as per AS 3798-2007:

Table 6 – Compaction Requirements

Item	Application	Minimum relative compaction, %	
		Minimum density ratio (Standard Compaction Effort) (Cohesive soils)	Minimum density index (Cohesionless soils)
1	Residential - lot, fill, house, sites	95	70

- After excavation and proof compaction, the excavated base is to be inspected and approved by a representative from this office prior to backfilling. At this stage it can be assessed whether any further materials need to be removed or whether further compaction of the base is required.
- A minimum of 0.8m sand cover is to be provided above the reactive material in order to achieve a Class “S” site with y_s < 10mm.
- A minimum of 1.2m sand cover is to be provided above the reactive material in order to achieve a Class “S” site with y_s < 5mm.
- A minimum of 1.6m sand cover is to be provided above the reactive clay material in order to achieve a Class “A” Lots.
- The ground levels should be built up to design levels with the stockpiled sand FILL and imported fill, if required. The imported fill should consist of free draining sand with not more than 5% passing a 75µm sieve and be free of organic matter and other deleterious materials. The fill materials should be placed in layers not exceeding 300mm loose thickness and compacted to achieve a minimum 8 PSP blows over the interval 150 – 450mm, 9 PSP blows over the interval 450 – 750mm and 11 PSP blows over the interval 750 -1050mm.
- After remedial earthworks have been completed, the earthworks should be inspected and approved by a representative from this office.

5. CONCLUSIONS

A site investigation has been carried out at the site of the proposed residential development to assess the geotechnical conditions. Parameter and design recommendations are incorporated in the body of the report. The following conclusions have been drawn from the site investigation:

- The average subsurface soil profile encountered comprised topsoil to 0.2m, natural clayey sand trace gravel to 0.2m (BH7 and BH9 to BH12) only, sand fill to 1.6m (BH1 and BH2) only, natural sand to 2.4m (BH3 and BH4) only and underlain by sandy clay trace gravel to the investigated depth of 3.5m.
- Perched groundwater was noted at the approximate depths of 1.7m, 1.8m and 1.5m in BH7, BH8 and BH9 locations, respectively.
- It is considered that the site is not suitable for on-site drainage in its current condition.
- Subject to prioposed non-reactive sand fill levels, the Lts within the site can be classified as Class “S” or Class “A” in accordance with AS 2870-2011 due to presence of low to moderately reactive CLAY deposits within the building site, provided that the recommended earthworks are undertaken.
- The full scope of the recommended earthworks is presented in Section 4.3, but generally comprises:
    - Stripping of topsoil and unsuitable materials
    - Winning of stockpiled sand fill for reuse as structural fill
    - Proof compaction of the base of excavations
    - Placement of sand fill to required level, and
    - Compaction in layers to final levels

6. LIMITATION OF FIELD INVESTIGATIONS

This report has been prepared in accordance with generally accepted consulting practice for Ardross Estates (S.A.) Pty Ltd using information supplied at the time and for the project specific requirements as understood by Structerre. To the best of our knowledge the information contained in this report is accurate at the date of issue, however it should be emphasised that any changes to ground conditions and/or the proposed structures may invalidate the recommendations given herein.

The conclusions and recommendations in this report are based on the site conditions revealed through selective point sampling, representing the conditions of the site in total, although the area investigated represents only a small portion of the site. The actual characteristics may vary significantly between successive test locations and sample intervals other than where observations, explorations and investigations have been made.

The materials and their geotechnical properties presented in this report may not represent the full range of materials and strengths that actually exist on site and the recommendations should be regarded as preliminary in nature. Allowances should be made for variability in ground conditions and any consequent impact on the development. Structerre accepts no responsibility and shall not be liable for any consequence of variations in ground conditions.

If ground conditions encountered during construction are different to that described in this report, this office should be notified immediately.

For and behalf of

STRUCTERRE CONSULTING

Margie Mortera
Geotechnical Assistant

Checked By: David Harding
Employee Title: Geotechnical Supervisor

Authorised By: Mel Castle
Employee Title: Division Manager - Geotechnical

Disclaimer
This report is at the request of the addressee and no liability is accepted by Structerre Consulting to any third person reading or relying upon the report, not withstanding any rule of law and/or equity to the contrary and that this report is strictly confidential and intended to be read and relied upon only be the addressee.

Job #	Revision	Authored	Checked	Authorised
J416957	0	MM	DH	MEC

7. REFERENCES

Department of Water – Perth Groundwater Atlas

Landgate Map Viewer

Geological Survey of Western Australia 1:50,000 Environmental Geology Series

AS 1170.4-2007 Structural design actions – Earthquake actions in Australia

AS 1289.3.1.2-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the liquid limit of a soil

AS 1289.3.2.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the plastic limit of a soil

AS 1289.3.3.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Calculation of the plasticity index of a soil

AS 1289.3.4.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the linear shrinkage of a soil

AS 1289.6.3.2-1997 Methods of testing soils for engineering purposes – Soil strength and consolidation tests – Determination of the penetration resistance of a soil – 9kg dynamic cone penetrometer test

AS 1726-2017 Geotechnical site investigation

AS 2870-2011 Residential slabs and footings

AS 3798-2007 Guidelines on earthworks for commercial and residential developments

AS 4055-2012 Wind loads for housing

APPENDIX 1 – SITE LOCATION MAP

Note: Showing approximate test locations only

LEGEND

Borehole

Depths of Non-reactive Material

STRUCterre consulting

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PROJECT:	Lot 3001 Eaton Drive, Eaton
PROJECT #: D300515	CLIENT: **Ardross Estates (S.A.) Pty Ltd**
JOB #: J416957	
SCALE: NTS	TITLE: Geotechnical Investigation Site Plan
DATE: 24 Aug '22	DRAWN BY: MM / CHECKED BY: DH

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Note: Showing approximate test locations only

LEGEND

BH Borehole

STRUCterre consulting

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PROJECT:	Lot 3001 Eaton Drive, Eaton
PROJECT #:	D300515
JOB #:	J416957
CLIENT:	**Ardross Estates (S.A.) Pty Ltd**
SCALE:	NTS
TITLE:	Geotechnical Investigation Site Plan
DATE:	24 Aug '22
DRAWN BY:	MM
CHECKED BY:	DH

DOC: GE:3.001

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APPENDIX 2 – SITE PHOTOS

Site Vegetation

SiteVegetation

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PROJECT:	Lot 3001 Eaton Drive, Eaton
PROJECT #: D300515	CLIENT: **Ardross Estates (S.A.) Pty Ltd**
JOB #: J416957	
SCALE: NTS	TITLE: Site Photographs
DATE: 24 Aug '22	DRAWN BY: MM / CHECKED BY: DH

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PHOTO 3 - Sample taken at BH4

PHOTO 4 - Sample taken at BH12

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PROJECT:	Lot 3001 Eaton Drive, Eaton
PROJECT #: D300515	CLIENT: **Ardross Estates (S.A.) Pty Ltd**
JOB #: J416957	
SCALE: NTS	TITLE: Site Photographs
DATE: 24 Aug '22	DRAWN BY: MM / CHECKED BY: DH

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APPENDIX 3 – BORELOGS

STRUCterre consulting engineers

(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH01**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381777
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6315340

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
1		SP: SAND: fine to medium grained, non-plastic, grey/brown (FILL)	L - MD				D to M	
2		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red (Alluvium)	S - F				M to W	
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH02**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381924
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6314960

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		SP: SAND: fine to medium grained, non-plastic, grey/brown (FILL)	L - MD				D to M	
1		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red (Alluvium)	S - F				M to W	
		Terminated at 1.50 m						
2								
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH03**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	382196
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6315533

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		SP: SAND: fine to medium grained, non-plastic, grey (Bassendean Sand)	MD				D to M	
2		*yellow*						
3.50		Terminated at 3.50 m						

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH04**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381857
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6314818

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:						
		SP: SAND: fine to medium grained, non-plastic, orange (Bassendean Sand)	L - MD					
1								
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, orange	S - F				D to M	
2								
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH05**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381873
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6314918

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:			0.2 - 1.1	B		
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red (Alluvium)	VS - S				M	
1		*orange*	S - F				M to W	
2								
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: As indicated
4. Co-ordinate system: WGS 84

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Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH06**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381909
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6314949

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:						
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red (Alluvium)	S - F				M	
			St					
1								
		orange					W	
2							M to W	
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH07**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381955
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6314961

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SC: Clayey SAND: fine to medium grained, low plasticity, trace gravel, red (Alluvium)	VL - L		0.2 - 1.7	B		
1			D				M to W	
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, orange					S	
2		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: As indicated
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH08**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381785
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6315175

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:						
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, orange (Alluvium)	VS - S					
			St				M to W	
1								
2							S	▼
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH09**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381927
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6315062

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:						
		SC: Clayey SAND: fine to medium grained, low plasticity, trace gravel, red (Alluvium)	VL - L				M to W	
1			D					
		orange					S	
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, orange					W	
2		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH10**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	382030
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6315040

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:						
		SC: Clayey SAND: fine to medium grained, low plasticity, trace gravel, red (Alluvium)	L - MD				M to W	
1		*orange*						
2		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, orange						
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH11**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	382029
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6315039

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:	L - MD					
		SC: Clayey SAND: fine to medium grained, low plasticity, trace gravel, red (Alluvium)	VL - L				M to W	
1		*orange*					W	
2		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, green					M to W	
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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(Appendix ORD: 12.2.3A)

Project Lot 3001 Eaton Drive, Eaton

Client Ardross Estates (S.A.) Pty Ltd

Test No. **BH12**

Project No.	D300515	**Logged By**	Callum Vane	**Machine**	Soil Retrieval Probe	**Easting**	381924
Job No.	J416957	**Date**	24/08/2022	**Hole Dia.**	65mm	**Northing**	6314962

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SC: Clayey SAND: fine to medium grained, low plasticity, trace gravel, red (Alluvium)	VL - L				M to W	
1		*orange*	L				W	
2		CI: Sandy CLAY: fine to medium grained, trace gravel, grey	F-St				M to W	
		Terminated at 2.50 m						
3								
4								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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APPENDIX 4 – LABORATORY TEST RESULTS

Sample No.	**36805**	**Client**	Geotechnical
Job No.	J416957	**Project**	Lot 3001 Eaton Dr, EATON

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH5 0.2-1.1m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	41
Plastic Limit	AS 1289.3.2.1	18
Plasticity Index	AS 1289.3.3.1	23
Linear Shrinkage	AS 1289.3.4.1	6
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	99
0.425	73
0.075	43

AS 1726:2017 Clause 6.1
Material Description: Sandy CLAY trace gravel
AS Group Symbol: CI or OI

Accredited for compliance with ISO/IEC 17025
WORLD RECOGNISED ACCREDITATION
STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

Jacob Pritchard
Authorized Signatory Senior Laboratory Technician

Date: 21-Sep-22

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Sample No.	**36806**	**Client**	Geotechnical
Job No.	J416957	**Project**	Lot 3001 Eaton Dr, EATON

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH7 0.2-1.7m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	34
Plastic Limit	AS 1289.3.2.1	17
Plasticity Index	AS 1289.3.3.1	17
Linear Shrinkage	AS 1289.3.4.1	9
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	98
0.425	56
0.075	31

AS 1726:2017 Clause 6.1
Material Description: Clayey SAND trace gravel
AS Group Symbol: SC

Accredited for compliance with ISO/IEC 17025
WORLD RECOGNISED ACCREDITATION
STRUCTERRE CONSULTING ENGINEERS BALCATTA LABORATORY ACCREDITATION NUMBER 18742

Jacob Pritchard
Authorized Signatory Senior Laboratory Technician

Date: 21-Sep-22

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APPENDIX 5 – BORELOG TERMINOLOGY

STRUCterre consulting engineers

Residential Geotechnical Commercial & Infrastructure

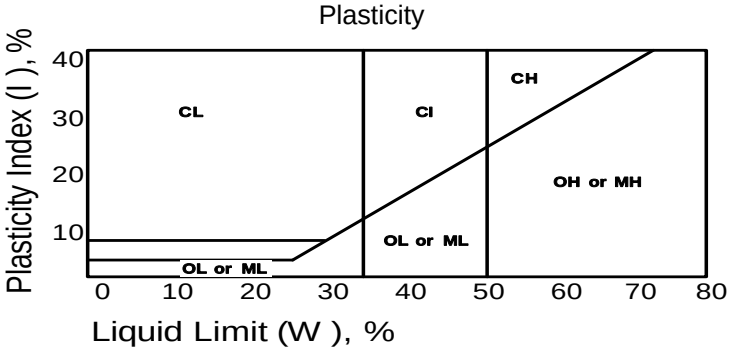
Inspect & Investigate Energy Assessment Environmental

BOREHOLE TERMINOLOGY

Particle Size Distribution

Major Division	Subdivision	Size
Boulders		>200mm
Cobbles		200 - 63mm
Gravel	Coarse	63 - 20mm
	Medium	20- 6mm
	Fine	6 - 2.36mm
Sand	Coarse	2.36 - 0.6mm
	Medium	0.6 - 0.2mm
	Fine	0.2 - 0.075mm

Plasticity



Consistency of Cohesive Soils

Term	Undrained Strength Su (kPa)	Field Guide
Very Soft	< 12	Exudes between the fingers when squeezed in hand
Soft	12 - 25	Can be moulded by light finger pressure
Firm	25 - 50	Can be moulded by strong finger pressure
Stiff	50 - 100	Cannot be moulded by Fingers. Can be indented by thumb.
Very Stiff	100 - 200	Can be indented by thumb nail
Hard	> 200	Can be indented with difficulty by thumb nail.
Friable	-	Crumbles or powders when scraped by thumbnail

Consistency/Density of Non-Cohesive Soils

Term	Density Index (%)	SPT "N" Value Comparison
Very Loose	< 15	0 - 4
Loose	15 - 35	4 - 10
Medium Dense	35 - 65	10 - 30
Dense	65 - 85	30 - 50
Very Dense	> 85	> 50

Moisture Content

D	Dry
M	Moist
W	Wet
S	Saturated

Minor Components

Term	Assessment Guide	Proportion of Minor Component In:
Trace	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component	Coarse grained soils: < 5 % Fine grained soils: <15%
With	Presence easily detected by feel or eye, soil properties little different to general properties of primary component	Coarse grained soils: 5 - 12 % Fine grained soils: 15 - 30%

Soil Legend

FILL	CLAY	GRAVEL	CONCRETE
TOPSOIL	SILT	LIMESTONE	COMBINATIONS
PEAT	SAND	BEDROCK	eg: Clay, Silty, Sandy

USCS

GW	Well graded gravel	SC	Clayey sand	OL	Organic low plasticity silt	CL	Low plasticity clay
GP	Poorly graded gravel	SM	Silty sand	ML	Low plasticity silt	CI	Intermediate plasticity clay
SW	Well graded sand			MH	High plasticity silt	CH	High plasticity clay
SP	Poorly graded sand			OH	Organic high plasticity silt	PT	Peat

DOC:GE:3.003

WA | QLD | NSW | VIC

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APPENDIX C

Hyd2o Bore Logs

(Appendix ORD: 12.2.3A)
Lithological Log

Hyd2o
Suite 1 387 Hay St
Subiaco, WA 6008

PO Box 1055
Subiaco WA 6904

Date :	**4/04/2024**			Bore Name
Client :	**Ardross Estates (S.A.) Pty Limited**	Job Number :	H24008	
Project:	**Millbridge Southbank Monitoring**	Start Hole :	**8:30**	**MW1**
Easting	**381903.052**	End Hole :	**10:00**	
Northing	**6315023.709**	Logged by :	**AFR**	
Datum:	GDA94	Total Depth :	**5.0**	
Drill type:	Drill Rig Auger	RL Top of Casing :	**5.524**	
Hole diameter:	2.5 inches	RL Nat Surface :	**4.924**	

support	backfill	water	Slot / Screen Depth	Depth (metres)	Soil Characteristics: Colour	Particle Size	Texture	Organic Content	Moisture	Comment
PVC (Class 9)	CEMENT			0.5m	Dark Brown	Fine to Medium	Sandy Clay	Low	Slightly Moist	
	BENTONITE SEAL			1.0m	Brown Dark Orange					
	GRAVEL	▽		1.5m	Brown	Medium	Clayey Sand		Moist	
				2.0m		Meidum to Coarse			Saturated	
				2.5m	Light Brown Light Orange			None		
				3.0m		Coarse				
				3.5m	Light Brown	Medium to Coarse				
				4.0m	Dark Beige	Fine to Medium	Sandy Clay			
				4.5m						
				5.0m	Dark Grey	Fine	Clay			end of hole at 5.0m

COLOUR : Black, White, Beige
Dark/Medium/Light : Brown, Red, Orange, Yellow, Grey, Blue
Composition : Solid , Blemish, Mottle

PARTICLE SIZE : Fine, Medium, Course

TEXTURE : Sand, Loamy Sand, Clayey Sand
Silt, Loam, Sandy Loam, Clayey Loam
Clay, Sandy Clay

ORGANICS : High, Medium, Low

MOISTURE : Dry, Slightly Moist, Moist, Saturated

Static Water Level

Date	5/04/2024
Stickup above NS (m)	0.6
Water Level bTOC (m)	
Water Level bNS (m)	

(Appendix ORD: 12.2.3A)
Lithological Log

Hyd2o
Suite 1 387 Hay St
Subiaco, WA 6008

PO Box 1055
Subiaco WA 6904

Date :	**4/04/2024**				Bore Name
Client :	**Ardross Estates (S.A.) Pty Limited**	Job Number :	H24008		
Project:	**Millbridge Southbank Monitoring**	Start Hole :	**10:00**		
Easting	**382077.647**	End Hole :	**11:15**		**MW2**
Northing	**6315146.037**	Logged by :	**AFR**		
Datum:	GDA94	Total Depth :	**6.5**		
Drill type:	Drill Rig Auger	RL Top of Casing	**4.819**		
Hole diameter:	2.5 inches	RL Nat Surface :	**4.219**		

support	backfill	water	Slot / Screen Depth	Depth (metres)	Soil Characteristics					
					Colour	Particle Size	Texture	Organic Content	Moisture	Comment
PVC (Class 9)	CEMENT			0.5m	Dark Brown Red	Fine to Medium	Clayey Sand	None	Dry	
	BENTONITE SEAL			1.0m	Red					
	GRAVEL			1.5m	Brown Red	Fine	Sandy Clay			
				2.0m	Brown	Fine to Medium				
				2.5m		Medium	Clayey Sand			
				3.0m	Dark Grey Blue	Fine	Clay		Slightly Moist	
				3.5m						
				4.0m	Dark Grey					
				4.5m	Dark Beige				Moist	
				5.0m						

COLOUR : Black, White, Beige
Dark/Medium/Light : Brown, Red, Orange, Yellow, Grey, Blue
Composition : Solid , Blemish, Mottle

PARTICLE SIZE : Fine, Medium, Course

TEXTURE : Sand, Loamy Sand, Clayey Sand
Silt, Loam, Sandy Loam, Clayey Loam
Clay, Sandy Clay

ORGANICS : High, Medium, Low

MOISTURE : Dry, Slightly Moist, Moist, Saturated

Static Water Level

Date	5/04/2024
Stickup above NS (m)	0.6
Water Level bTOC (m)	
Water Level bNS (m)	

(Appendix ORD: 12.2.3A)
Lithological Log

Hyd2o
Suite 1 387 Hay St
Subiaco, WA 6008

PO Box 1055
Subiaco WA 6904

Date :	**4/04/2024**				Bore Name
Client :	**Ardross Estates (S.A.) Pty Limited**	Job Number :	H24008		
Project:	**Millbridge Southbank Monitoring**	Start Hole :	**10:00**		
Easting	**382077.647**	End Hole :	**11:15**		**MW2**
Northing	**6315146.037**	Logged by :	**AFR**		
Datum:	GDA94	Total Depth :	**6.5**		
Drill type:	Drill Rig Auger	RL Top of Casing	**4.819**		
Hole diameter:	2.5 inches	RL Nat Surface :	**4.219**		

support	backfill	water	Slot / Screen Depth	Depth (metres)	Soil Characteristics					
					Colour	Particle Size	Texture	Organic Content	Moisture	Comment
PVC (Class 9)	GRAVEL	▽		5.5m	Dark Beige	Fine	Clay	None	Saturated	Hard to drill
				6.0m						
				6.5m						end of hole at 6.5m
				7.0m						
				7.5m						
				8.0m						
				8.5m						
				9.0m						
				9.5m						
				10.0m						

COLOUR :	Black, White, Biege
	Dark/Medium/Light : Brown, Red, Orange, Yellow, Grey, Blue
	Composition : Solid , Blemish, Mottle
PARTICLE SIZE :	Fine, Medium, Course
TEXTURE :	Sand, Loamy Sand, Clayey Sand
	Silt, Loam, Sandy Loam, Clayey Loam
	Clay, Sandy Clay
ORGANICS :	High, Medium, Low
MOISTURE :	Dry, Slightly Moist, Moist, Saturated

Static Water Level

Date	5/04/2024
Stickup above NS (m)	0.6
Water Level bTOC (m)	
Water Level bNS (m)	

(Appendix ORD: 12.2.3A)
Lithological Log

Hyd2o
Suite 1 387 Hay St
Subiaco, WA 6008

PO Box 1055
Subiaco WA 6904

Date :	**4/04/2024**				
Client :	**Ardross Estates (S.A.) Pty Limited**	Job Number :	H24008	Bore Name	
Project:	**Millbridge Southbank Monitoring**	Start Hole :	**11:20**	**MW3**	
Easting	**381942.386**	End Hole :	**12:30**		
Northing	**6315295.032**	Logged by :	**AFR**		
Datum:	GDA94	Total Depth :	**5.0**		
Drill type:	Drill Rig Auger	RL Top of Casing	**4.06**		
Hole diameter:	2.5 inches	RL Nat Surface :	**3.46**		

support	backfill	water	Slot / Screen Depth	Depth (metres)	Soil Characteristics: Colour	Particle Size	Texture	Organic Content	Moisture	Comment
PVC (Class 9)	CEMENT			0.5m	Dark Brown Brown			Low		
	BENTONITE SEAL			1.0m	Dark Brown	Fine	Sandy Clay		Dry	
	GRAVEL			1.5m	Dark Brown Red					
				2.0m	Brown Dark Brown	Medium to Coarse	Clayey Sand		Slightly Moist	
				2.5m	Brown	Coarse				
						Medium				
				3.0m	Dark Brown	Fine to Medium	Sandy Clay	None		
		▽		3.5m	Dark Grey	Fine			Moist	
				4.0m			Clay			
				4.5m	Grey		Sandy Clay		Saturated	
				5.0m						

COLOUR :	Black, White, Beige Dark/Medium/Light : Brown, Red, Orange, Yellow, Grey, Blue Composition : Solid , Blemish, Mottle
PARTICLE SIZE :	Fine, Medium, Course
TEXTURE :	Sand, Loamy Sand, Clayey Sand Silt, Loam, Sandy Loam, Clayey Loam Clay, Sandy Clay
ORGANICS :	High, Medium, Low
MOISTURE :	Dry, Slightly Moist, Moist, Saturated

Static Water Level

Date	5/04/2024
Stickup above NS (m)	0.6
Water Level bTOC (m)	
Water Level bNS (m)	

(Appendix ORD: 12.2.3A)
Lithological Log

Hyd2o
Suite 1 387 Hay St
Subiaco, WA 6008

PO Box 1055
Subiaco WA 6904

Date :	**4/04/2024**				Bore Name
Client :	**Ardross Estates (S.A.) Pty Limited**	Job Number :	H24008		
Project:	**Millbridge Southbank Monitoring**	Start Hole :	**13:00**		
Easting	**381739.273**	End Hole :	**14:20**		**MW4**
Northing	**6314828.279**	Logged by :	**AFR**		
Datum:	GDA94	Total Depth :	**9.5**		
Drill type:	Drill Rig Auger	RL Top of Casing	**11.496**		
Hole diameter:	2.5 inches	RL Nat Surface :	**10.896**		

support	backfill	water	Slot / Screen Depth	Depth (metres)	Soil Characteristics					
					Colour	Particle Size	Texture	Organic Content	Moisture	Comment
PVC (Class 9)	CEMENT			0.5m	Beige	Fine to Medium	Sand	None	Dry	
	BENTONITE SEAL			1.0m	Light Brown					
	GRAVEL			1.5m	Light Brown Dark Yellow	Medium				
				2.0m	Dark Yellow					
				2.5m						
				3.0m	Light Brown		Sand with minor Laterite Gravel		Slightly Moist	
				3.5m						
				4.0m	Light Brown Dark Yellow		Sand			
				4.5m						
				5.0m						

COLOUR : Black, White, Beige
Dark/Medium/Light : Brown, Red, Orange, Yellow, Grey, Blue
Composition : Solid , Blemish, Mottle

PARTICLE SIZE : Fine, Medium, Course

TEXTURE : Sand, Loamy Sand, Clayey Sand
Silt, Loam, Sandy Loam, Clayey Loam
Clay, Sandy Clay

ORGANICS : High, Medium, Low

MOISTURE : Dry, Slightly Moist, Moist, Saturated

Static Water Level

Date	5/04/2024
Stickup above NS (m)	0.6
Water Level bTOC (m)	
Water Level bNS (m)	

(Appendix ORD: 12.2.3A)
Lithological Log

Hyd2o
Suite 1 387 Hay St
Subiaco, WA 6008

PO Box 1055
Subiaco WA 6904

Date :	**4/04/2024**			Bore Name
Client :	**Ardross Estates (S.A.) Pty Limited**	Job Number :	H24008	
Project:	**Millbridge Southbank Monitoring**	Start Hole :	**13:00**	**MW4**
Easting	**381739.273**	End Hole :	**14:20**	
Northing	**6314828.279**	Logged by :	**AFR**	
Datum:	GDA94	Total Depth :	**9.5**	
Drill type:	Drill Rig Auger	RL Top of Casing :	**11.496**	
Hole diameter:	2.5 inches	RL Nat Surface :	**10.896**	

support	backfill	water	Slot / Screen Depth	Depth (metres)	Soil Characteristics: Colour	Particle Size	Texture	Organic Content	Moisture	Comment
PVC (Class 9)	GRAVEL	▽		5.5m	Light Brown Dark Yellow	Fine to Medium	Sand	None	Slightly Moist	
				6.0m						
				6.5m						
				7.0m						
				7.5m					Moist	
				8.0m						
				8.5m			Clayey Sand		Saturated	
				9.0m	Beige Light Brown					
				9.5m						
				10.0m						

COLOUR : Black, White, Beige
Dark/Medium/Light : Brown, Red, Orange, Yellow, Grey, Blue
Composition : Solid , Blemish, Mottle

PARTICLE SIZE : Fine, Medium, Course

TEXTURE : Sand, Loamy Sand, Clayey Sand
Silt, Loam, Sandy Loam, Clayey Loam
Clay, Sandy Clay

ORGANICS : High, Medium, Low

MOISTURE : Dry, Slightly Moist, Moist, Saturated

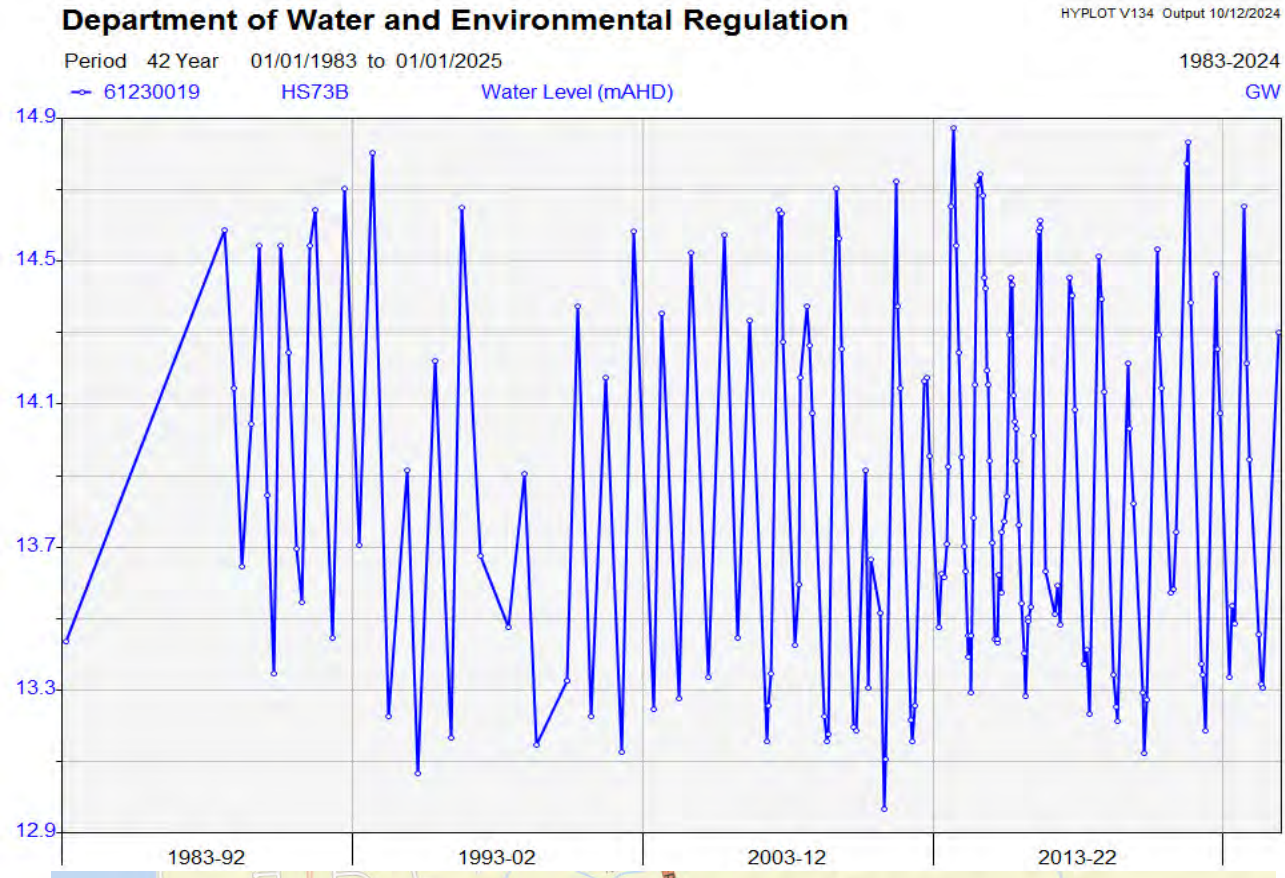
Static Water Level

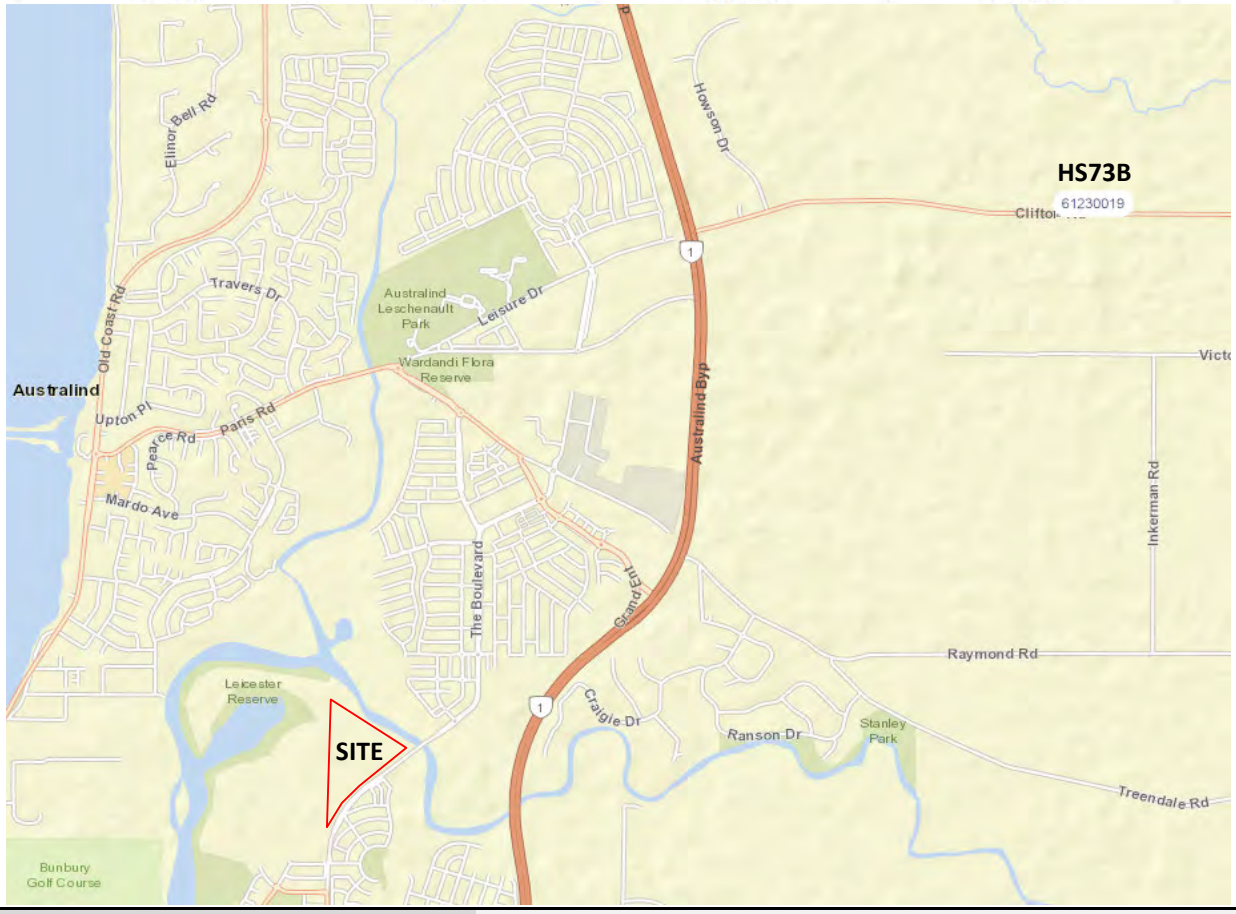
Date	5/04/2024
Stickup above NS (m)	0.6
Water Level bTOC (m)	
Water Level bNS (m)	

APPENDIX D

DWER Bore Hydrographs

Date : 5/2/2025 Job No H23088





hyd2o

Lot 3001 Eaton Dr Eaton LWMS

DWER Bore Long Term Hydrographs

Appendix D

APPENDIX E

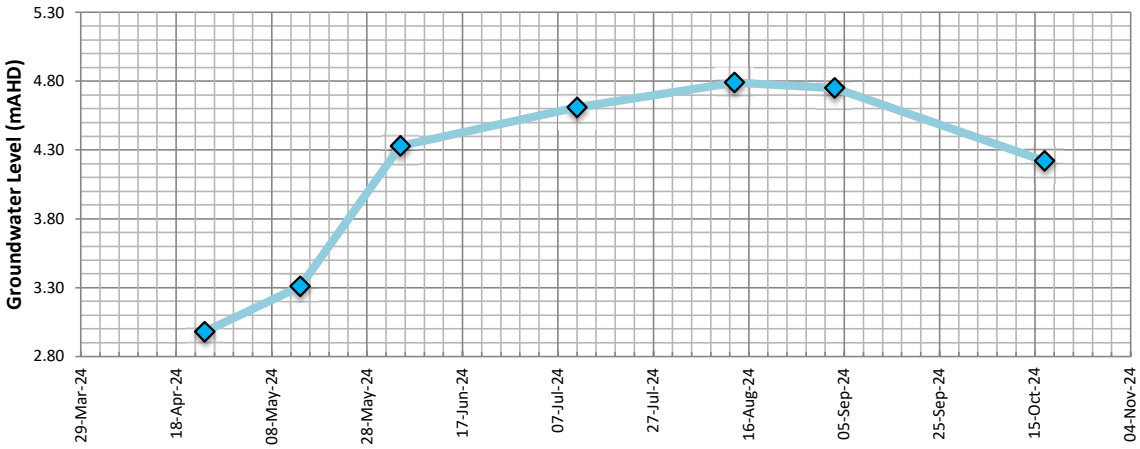
Site Groundwater Level Data

H24008 Millbridge Southbank Monitoring

MW1 Site Bore MW1

Data Analysis Period Start Date	24/04/2024	Easting	381903.052	Natural Surface (mAHD)	4.92
Data Analysis Period End Date	18/10/2024	Northing	6315023.709	Top of Casing (m AHD)	5.52
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	2.55	2.98	1.94
14/05/2024	2.21	3.31	1.61
4/06/2024	1.20	4.33	0.59
11/07/2024	0.91	4.61	0.31
13/08/2024	0.73	4.79	0.13
3/09/2024	0.77	4.75	0.17
17/10/2024	1.30	4.22	0.70

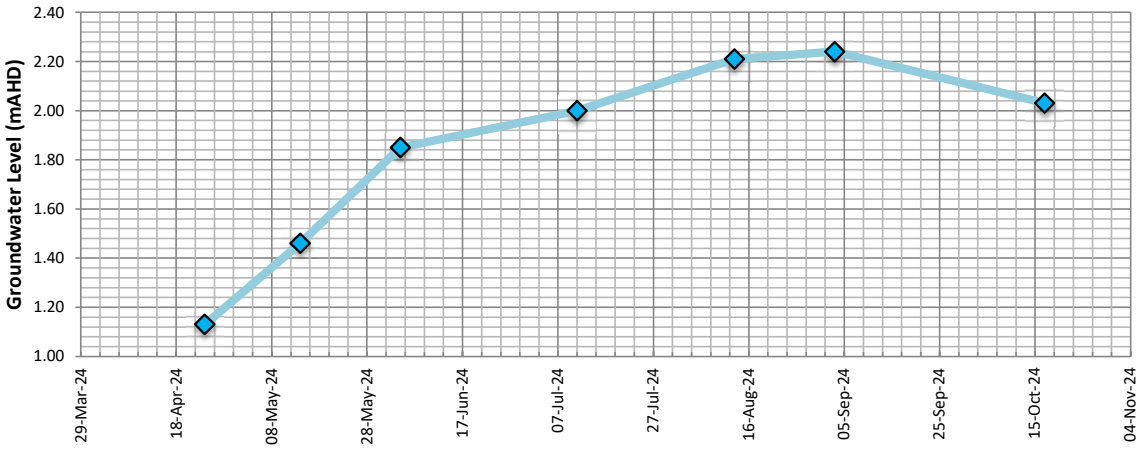
Minimum Recorded Level (mAHD)	2.98
Maximum Recorded Level (mAHD)	4.79

H24008 Millbridge Southbank Monitoring

MW2 Site Bore MW2

Data Analysis Period Start Date	24/04/2024	Easting	382077.647	Natural Surface (mAHD)	4.22
Data Analysis Period End Date	18/10/2024	Northing	6315146.037	Top of Casing (m AHD)	4.82
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	3.69	1.13	3.09
14/05/2024	3.36	1.46	2.76
4/06/2024	2.97	1.85	2.37
11/07/2024	2.82	2.00	2.22
13/08/2024	2.61	2.21	2.01
3/09/2024	2.58	2.24	1.98
17/10/2024	2.79	2.03	2.19

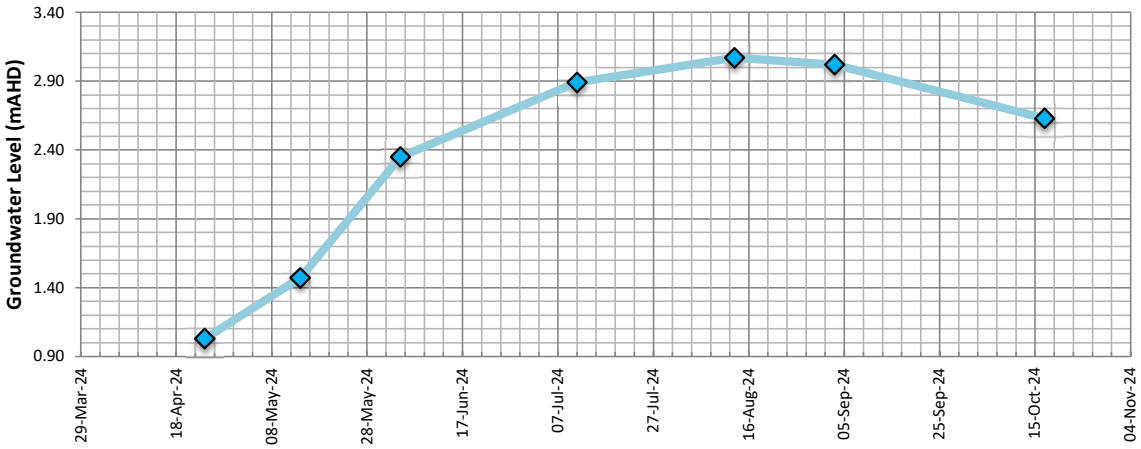
Minimum Recorded Level (mAHD)	1.13
Maximum Recorded Level (mAHD)	2.24

H24008 Millbridge Southbank Monitoring

MW3 Site Bore MW3

Data Analysis Period Start Date	24/04/2024	Easting	381942.386	Natural Surface (mAHD)	3.46
Data Analysis Period End Date	18/10/2024	Northing	6315295.032	Top of Casing (m AHD)	4.06
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	3.04	1.03	2.43
14/05/2024	2.59	1.47	1.99
4/06/2024	1.72	2.35	1.11
11/07/2024	1.17	2.89	0.57
13/08/2024	0.99	3.07	0.39
3/09/2024	1.04	3.02	0.44
17/10/2024	1.43	2.63	0.83

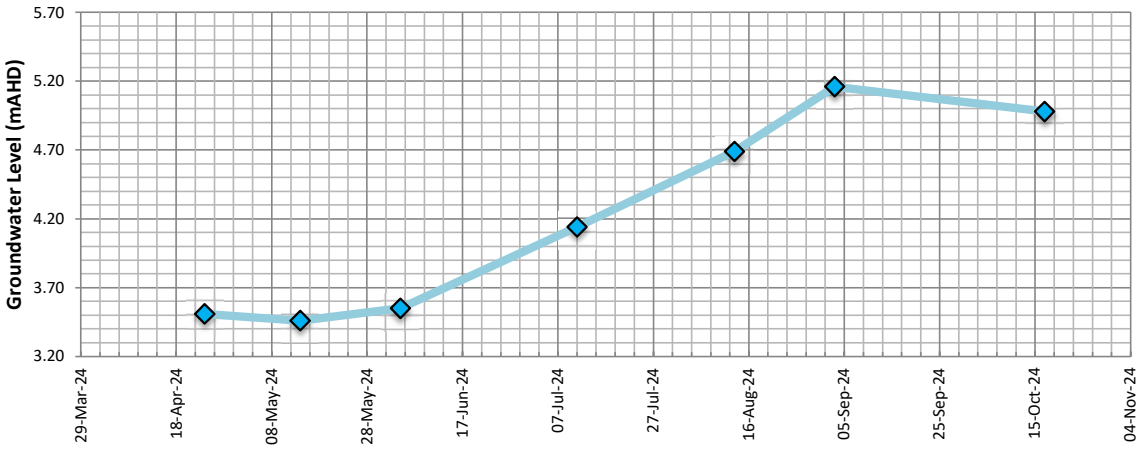
Minimum Recorded Level (mAHD)	1.03
Maximum Recorded Level (mAHD)	3.07

H24008 Millbridge Southbank Monitoring

MW4 Site Bore MW4

Data Analysis Period Start Date	24/04/2024	Easting	381739.273	Natural Surface (mAHD)	10.90
Data Analysis Period End Date	18/10/2024	Northing	6314828.279	Top of Casing (m AHD)	11.50
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	7.99	3.51	7.39
14/05/2024	8.04	3.46	7.44
4/06/2024	7.95	3.55	7.35
11/07/2024	7.36	4.14	6.76
13/08/2024	6.81	4.69	6.21
3/09/2024	6.34	5.16	5.74
17/10/2024	6.52	4.98	5.92

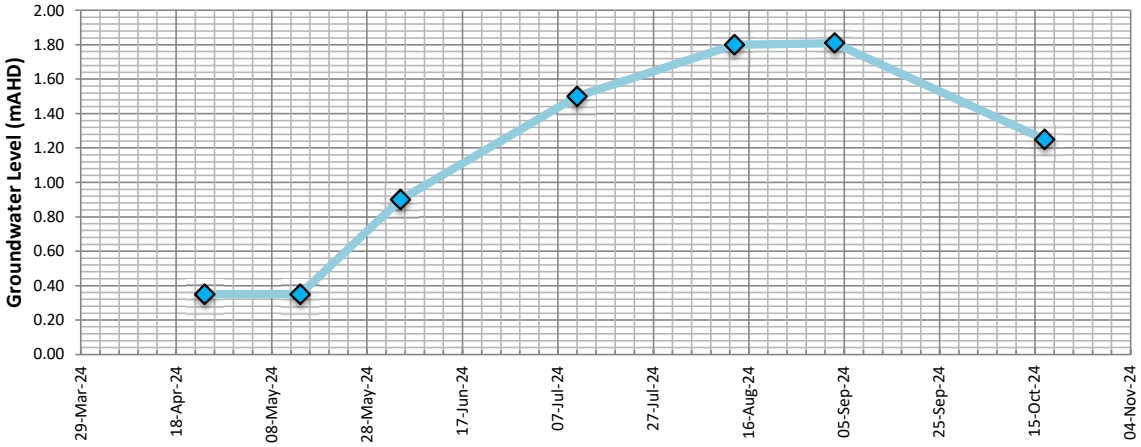
Minimum Recorded Level (mAHD)	3.46
Maximum Recorded Level (mAHD)	5.16

H24008 Millbridge Southbank Monitoring

Ext1 External Bore Ext1

Data Analysis Period Start Date	24/04/2024	Easting	381695.829	Natural Surface (mAHD)	2.08
Data Analysis Period End Date	18/10/2024	Northing	6315461.194	Top of Casing (m AHD)	2.98
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	2.63	0.35	1.73
14/05/2024	2.63	0.35	1.73
4/06/2024	2.08	0.90	1.18
11/07/2024	1.48	1.50	0.58
13/08/2024	1.18	1.80	0.28
3/09/2024	1.18	1.81	0.27
17/10/2024	1.73	1.25	0.83

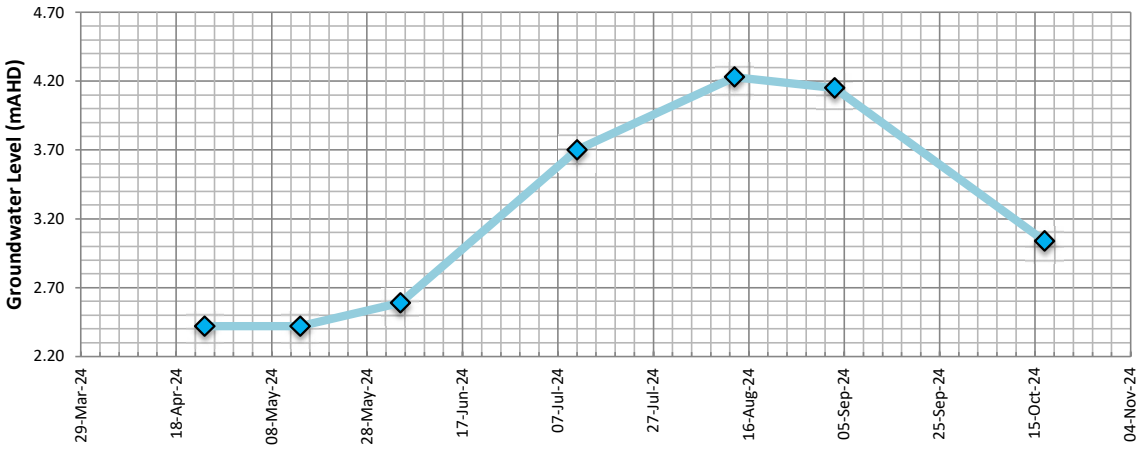
Minimum Recorded Level (mAHD)	0.35
Maximum Recorded Level (mAHD)	1.81

H24008 Millbridge Southbank Monitoring

Ext2 External Bore Ext2

Data Analysis Period Start Date	24/04/2024	Easting	381703.542	Natural Surface (mAHD)	4.56
Data Analysis Period End Date	18/10/2024	Northing	6315188.022	Top of Casing (m AHD)	5.46
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	3.04	2.42	2.14
14/05/2024	3.04	2.42	2.14
4/06/2024	2.87	2.59	1.97
11/07/2024	1.76	3.70	0.86
13/08/2024	1.23	4.23	0.33
3/09/2024	1.31	4.15	0.41
17/10/2024	2.42	3.04	1.52

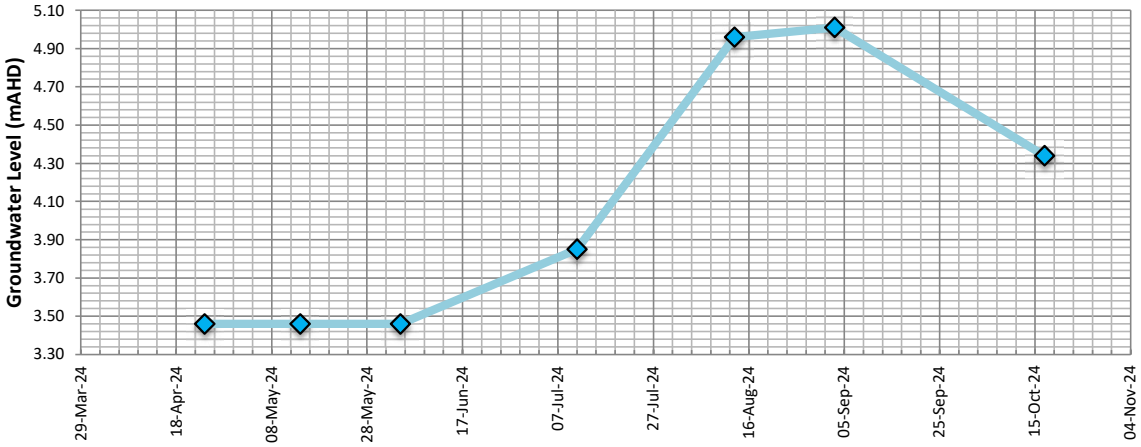
Minimum Recorded Level (mAHD)	2.42
Maximum Recorded Level (mAHD)	4.23

H24008 Millbridge Southbank Monitoring

Ext3 External Bore Ext3

Data Analysis Period Start Date	24/04/2024	Easting	381705.501	Natural Surface (mAHD)	5.73
Data Analysis Period End Date	18/10/2024	Northing	6314990.613	Top of Casing (m AHD)	6.53
				End of Hole (mAHD)	

Report Date : 18/10/2024



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
24/04/2024	3.07	3.46	2.27
14/05/2024	3.07	3.46	2.27
4/06/2024	3.07	3.46	2.27
11/07/2024	2.68	3.85	1.88
13/08/2024	1.57	4.96	0.77
3/09/2024	1.52	5.01	0.72
17/10/2024	2.19	4.34	1.39

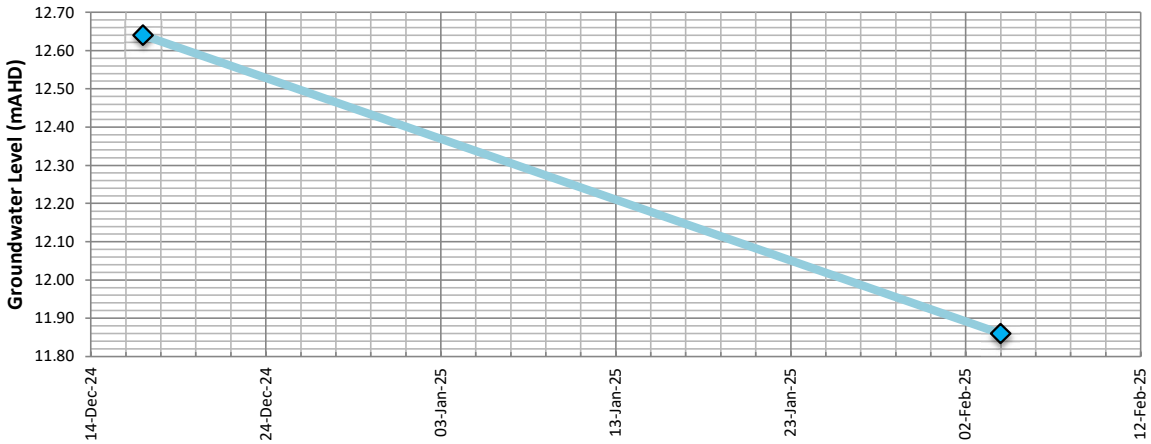
Minimum Recorded Level (mAHD)	3.46
Maximum Recorded Level (mAHD)	5.01

H24008 Millbridge Southbank Monitoring

BY16B DWER Bore BY16B

				Natural Surface (mAHD)	
Data Analysis Period Start Date	24/04/2024	Easting	384069.63	Top of Casing (m AHD)	14.89
Data Analysis Period End Date	18/10/2024	Northing	6311128.15	End of Hole (mAHD)	

Report Date : 6/02/2025



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
17/12/2024	2.25	12.64	
4/02/2025	3.03	11.86	

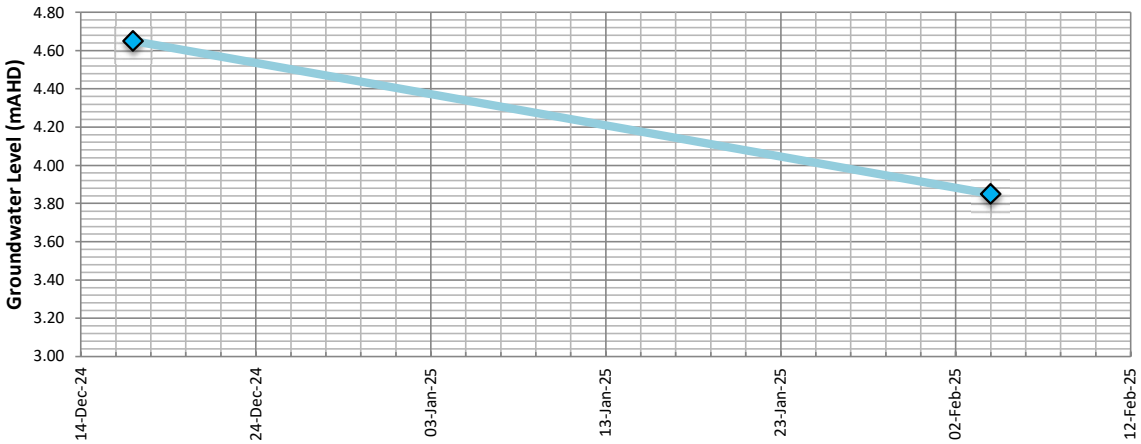
Minimum Recorded Level (mAHD)	11.86
Maximum Recorded Level (mAHD)	12.64

H24008 Millbridge Southbank Monitoring

BY17B DWER Bore BY17B

Data Analysis Period Start Date	24/04/2024	Easting	384355	Natural Surface (mAHD)	
Data Analysis Period End Date	18/10/2024	Northing	6316062.5	Top of Casing (m AHD)	14.07
				End of Hole (mAHD)	

Report Date : 6/02/2025



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
17/12/2024	9.42	4.65	
4/02/2025	10.22	3.85	

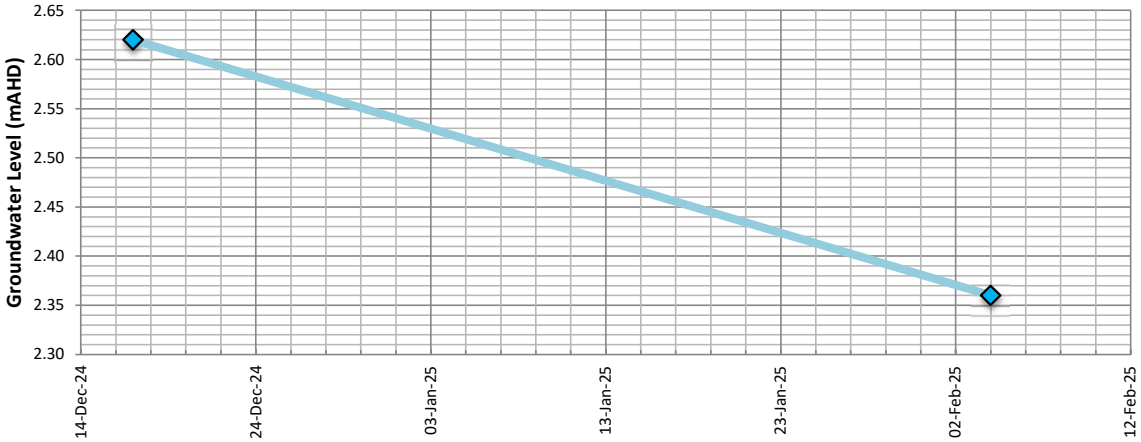
Minimum Recorded Level (mAHD)	3.85
Maximum Recorded Level (mAHD)	4.65

H24008 Millbridge Southbank Monitoring

HS74A DWER Bore HS74A

Data Analysis Period Start Date	24/04/2024	Easting	381096.01	Natural Surface (mAHD)	
Data Analysis Period End Date	18/10/2024	Northing	6318455.5	Top of Casing (m AHD)	7.78
				End of Hole (mAHD)	

Report Date : 6/02/2025



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
17/12/2024	5.16	2.62	
4/02/2025	5.42	2.36	

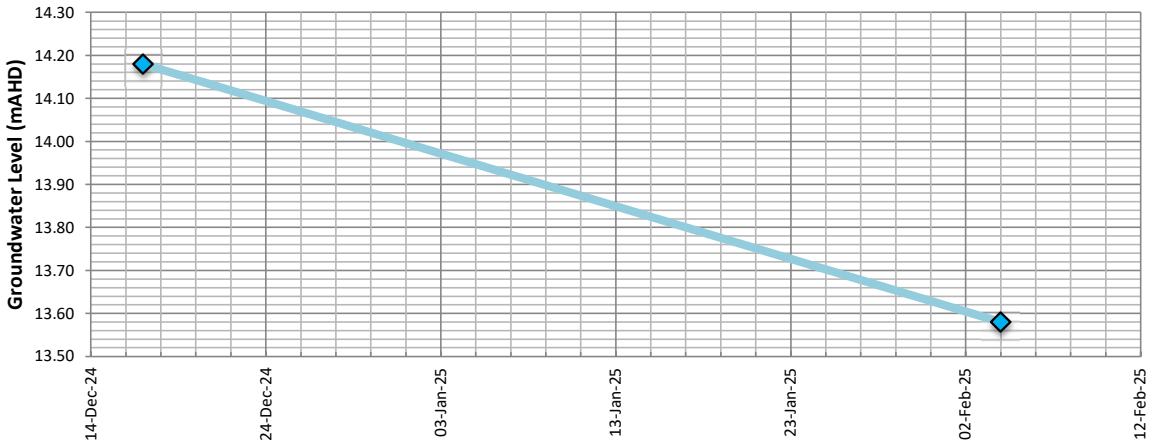
Minimum Recorded Level (mAHD)	2.36
Maximum Recorded Level (mAHD)	2.62

H24008 Millbridge Southbank Monitoring

HS73B DWER Bore HS73B

Data Analysis Period Start Date	24/04/2024	Easting	386050	Natural Surface (mAHD)	
Data Analysis Period End Date	18/10/2024	Northing	6318608.5	Top of Casing (m AHD)	16.24
				End of Hole (mAHD)	

Report Date : 6/02/2025



Date	Groundwater bTOC	Groundwater mAHD	Depth Below NS m
17/12/2024	2.06	14.18	
4/02/2025	2.66	13.58	

Minimum Recorded Level (mAHD)	13.58
Maximum Recorded Level (mAHD)	14.18

APPENDIX F

UNDO Pre Development
Nutrient Modelling

(Appendix ORD: 12.2.3A)

Government of **Western Australia**
Department of **Water and Environmental Regulation**

Project: Southbank Millbridge LWMS

Date: 30/09/2024

Version: Version 1.2.0.19289

Subregion name: Subregion 1

Landuse	Percent (%)	Area (ha)	Input load Nitrogen (kg)	Input load Phosphorus (kg)
Residential	0	0.00	0.00	0.00
Industrial, commercial & schools	0	0.00	0.00	0.00
Rural living	100	13.78	965.98	181.90
Public open space	0	0.00	0.00	0.00
Road reserve	0	0.00	0.00	0.00

Total area (ha)	Total percent (%)
13.78	100

Nitrogen input (kg/yr)	Phosphorus input (kg/yr)
1038.05	183.96

Nitrogen export (kg/yr)	Phosphorus (kg/yr)
7.25	1.23

Rural living

Landuse	Percent (%)	Area (ha)
Unrestricted	100	13.78
No livestock	0	0.00
No clearing apart from the housing pad	0	0.00

Total area (ha)	Total percent (%)
13.78	100

Nitrogen input (kg)	Phosphorus input (kg)
965.98	181.90

Note: Commercial horticultre is not permitted in the rural living zone, due to spray drift buffers.

(Appendix ORD: 12.2.3A)

Soil and drainage information

Type of drainage	**Infiltration**	**Does it contain imported fill?**	**No**
Soil type	**Pinjarra**	**Does subregion contain onsite sewage diposal system?**	**No**
Depth to groundwater (m)	**1**		
Groundwater slope (%)	**0.01**		
Soil PRI	**19.3**		

Note: Please attach the results of soil tests to this report when submitting.

Summary: Nutrient stripping devices

Treatment	Name	Size (m²)	Treated area (ha)	Treating	N removed (kg/yr)	P removed (kg/yr)
Load removed					**0.00**	**0.00**
Net export					**7.25**	**1.23**

Summary: Nutrient load exports

Region	Area (ha)	P export (kg/yr)	N export (kg/yr)
Subregion 1	13.78	1.23	7.25

PRE-TREATMENT LOAD (kg/yr)		LOAD REMOVED (kg/yr)		NET LOAD EXPORT (kg/yr)	
NITROGEN	PHOSPHORUS	NITROGEN	PHOSPHORUS	NITROGEN	PHOSPHORUS
7.25	**1.23**	**0.00**	**0.00**	**7.25**	**1.23**

APPENDIX G

Groundwater Quality Data

FieldDAE
Field Data Analysis & Evaluation System

Water Quality Monitoring Data

	Date	Site	Monitored By	Monitoring Comment	Code Unit	GWL bToC mBToC	GWL mAHD mAHD	T °C	EC mS/cm	pH pH	DO %	TN mg/L	TKN mg/L	NO3 mg/L	NO2 mg/L	Nox mg/L	NH3 mg/L	TP mg/L	FRP mg/L	As mg/L	Cd mg/L	Cr mg/L	Cu mg/L	Pb mg/L	Hg mg/L	Ni mg/L
1	24/04/2024	MW1	Ardross		2.55	2.98																				
2	24/04/2024	MW2	Ardross		3.69	1.13																				
3	24/04/2024	MW3	Ardross		3.04	1.03																				
4	24/04/2024	MW4	Ardross		7.99	3.51																				
5	24/04/2024	Ext1	Ardross	damp	2.63	0.35																				
6	24/04/2024	Ext2	Ardross	dry	3.04	2.42																				
7	24/04/2024	Ext3	Ardross	dry	3.07	3.46																				
8	14/05/2024	MW1	AFR & TD		2.21	3.31	21.3	0.620	6.01	21.5	0.81	0.80	0.05	0.050	0.05	0.050	0.054	0.050	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.001
9	14/05/2024	MW2	AFR & TD		3.36	1.46	22.8	1.365	6.26	11.3	0.36	0.35	0.05	0.050	0.05	0.050	0.050	0.050	0.0014	0.0001	0.001	0.001	0.001	0.0001	0.0032	0.0014
10	14/05/2024	MW3	AFR & TD		2.59	1.47	22.8	0.747	6.43	54.6	4.20	0.48	3.70	0.005	3.70	0.0093	0.050	0.011	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.001
11	14/05/2024	MW4	AFR & TD		8.04	3.46	21.4	0.337	5.96	67.3	7.50	0.90	6.60	0.005	6.60	0.005	0.050	0.005	0.001	0.0001	0.001	0.001	0.001	0.0001	0.003	0.0086
12	14/05/2024	Ext1	AFR & TD	dry	2.63	0.35																				
13	14/05/2024	Ext2	AFR & TD	dry	3.04	2.42																				
14	14/05/2024	Ext3	AFR & TD	dry	3.07	3.46																				
15	4/06/2024	MW1	Ardross		1.20	4.33																				
16	4/06/2024	MW2	Ardross		2.97	1.85																				
17	4/06/2024	MW3	Ardross		1.72	2.35																				
18	4/06/2024	MW4	Ardross		7.95	3.55																				
19	4/06/2024	Ext1	Ardross		2.08	0.90																				
20	4/06/2024	Ext2	Ardross		2.87	2.59																				
21	4/06/2024	Ext3	Ardross	damp	3.07	3.46																				
22	11/07/2024	MW1	Ardross		0.91	4.61																				
23	11/07/2024	MW2	Ardross		2.82	2.00																				
24	11/07/2024	MW3	Ardross		1.17	2.89																				
25	11/07/2024	MW4	Ardross		7.36	4.14																				
26	11/07/2024	Ext1	Ardross		1.48	1.50																				
27	11/07/2024	Ext2	Ardross		1.76	3.70																				
28	11/07/2024	Ext3	Ardross		2.68	3.85																				
29	13/08/2024	MW1	AFR & TD		0.73	4.79	18.4	0.403	6.02	14.8	0.860	0.110	0.720	0.025	0.750	0.027	0.050	0.005	0.0010	0.0001	0.0010	0.003	0.0010	0.00005	0.001	0.0010
30	13/08/2024	MW2	AFR & TD		2.61	2.21	19.6	0.683	6.21	18.1	0.370	0.360	0.018	0.005	0.018	0.120	0.050	0.008	0.0010	0.0001	0.0010	0.001	0.0010	0.00005	0.001	0.0010
31	13/08/2024	MW3	AFR & TD		0.99	3.07	18.1	0.745	6.36	78.1	6.600	0.200	6.400	0.005	6.400	0.014	0.050	0.006	0.0010	0.0001	0.0010	0.001	0.0010	0.00005	0.001	0.0010
32	13/08/2024	MW4	AFR & TD		6.81	4.69	20.5	0.241	6.19	83.7	6.300	0.190	6.100	0.005	6.100	0.034	0.050	0.005	0.0010	0.0001	0.0010	0.001	0.0010	0.00005	0.001	0.0021
33	13/08/2024	Ext1	AFR & TD		1.18	1.80	19.1	0.779	5.74	13.2	0.200	0.170	0.026	0.005	0.026	0.026	0.050	0.010	0.0010	0.0001	0.0010	0.001	0.0010	0.00005	0.001	0.0011
34	13/08/2024	Ext2	AFR & TD		1.23	4.23	17.5	0.252	5.50	30.4	4.100	0.160	3.900	0.005	3.900	0.014	0.050	0.006	0.0010	0.0001	0.0010	0.001	0.0010	0.00005	0.001	0.0014
35	13/08/2024	Ext3	AFR & TD		1.57	4.96	18.3	0.369	5.87	15.6	0.630	0.620	0.007	0.005	0.007	0.160	0.093	0.028	0.0010	0.0001	0.0010	0.001	0.0010	0.00005	0.001	0.0024
36	3/09/2024	MW1	Ardross		0.77	4.75																				
37	3/09/2024	MW2	Ardross		2.58	2.24																				
38	3/09/2024	MW3	Ardross		1.04	3.02																				
39	3/09/2024	MW4	Ardross		6.34	5.16																				
40	3/09/2024	Ext1	Ardross		1.18	1.81																				
41	3/09/2024	Ext2	Ardross		1.31	4.15																				
42	3/09/2024	Ext3	Ardross		1.52	5.01																				
43	17/10/2024	MW1	AFR & TD		1.30	4.22																				
44	17/10/2024	MW2	AFR & TD		2.79	2.03																				
45	17/10/2024	MW3	AFR & TD		1.43	2.63																				

FieldDAE
Field Data Analysis & Evaluation System

Water Quality Monitoring Data

	Date	Site	Monitored By	Monitoring Comment	Code	GWL bToC	GWL mAHD	T	EC	pH	DO	TN	TKN	NO3	NO2	Nox	NH3	TP	FRP	As	Cd	Cr	Cu	Pb	Hg	Ni
					Unit	mBToC	mAHD	°C	mS/cm	pH	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
46	17/10/2024	MW4	AFR & TD		6.52	4.98																				
47	17/10/2024	Ext1	AFR & TD		1.73	1.25																				
48	17/10/2024	Ext2	AFR & TD		2.42	3.04																				
49	17/10/2024	Ext3	AFR & TD		2.19	4.34																				
50	13/11/2024	MW1	AFR & TD		1.67	3.85	23	0.332	6.24	22.3	0.35	0.3	0.044	0.005	0.047	0.069	0.05	0.012	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001
51	13/11/2024	MW2	AFR & TD		3.08	1.74	22.4	0.695	6.1	27.3	0.31	0.3	0.011	0.005	0.013	0.09	0.05	0.025	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001
52	13/11/2024	MW3	AFR & TD		1.74	2.32	22.3	0.591	6.36	33.6	0.44	0.18	0.25	0.005	0.25	0.081	0.05	0.012	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.003
53	13/11/2024	MW4	AFR & TD		6.72	4.78	23	0.189	6.84	79.7	6.2	0.15	6.1	0.005	6.1	0.005	0.05	0.0067	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001
54	13/11/2024	Ext1	AFR & TD		2.04	0.94	21.9	0.733	5.34	13.2	0.8	0.77	0.03	0.005	0.034	0.017	0.05	0.034	0.0024	0.0001	0.001	0.001	0.001	0.00005	0.001	0.013
55	13/11/2024	Ext2	AFR & TD		2.80	2.66	22.9	0.468	5.96	14.2	1.7	1.6	0.14	0.0084	0.15	0.08	0.24	0.0091	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.002
56	13/11/2024	Ext3	AFR & TD		2.67	3.86	22.9	0.592	6.14	17.4	1.6	1.6	0.04	0.0085	0.048	0.59	0.13	0.048	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001
57	17/12/2024	MW1	AFR & TD		1.67	3.85																				
58	17/12/2024	MW2	AFR & TD		3.10	1.72																				
59	17/12/2024	MW3	AFR & TD		1.83	2.23																				
60	17/12/2024	MW4	AFR & TD		6.83	4.67																				
61	17/12/2024	Ext1	AFR & TD		2.13	0.85																				
62	17/12/2024	Ext2	AFR & TD		2.95	2.51																				
63	17/12/2024	Ext3	AFR & TD		2.91	3.62																				
64	17/12/2024	BY16B	AFR & TD		2.25	12.64																				
65	17/12/2024	BY17B	AFR & TD		9.42	4.65																				
66	17/12/2024	HS74A	AFR & TD		5.16	2.62																				
67	17/12/2024	HS73B	AFR & TD		2.06	14.18																				
68	4/02/2025	MW1	AFR & TD		2.12	3.40	25	0.571	5.96	0.9																
69	4/02/2025	MW2	AFR & TD		3.37	1.45	24.2	0.622	5.22	22.1																
70	4/02/2025	MW3	AFR & TD		2.31	1.75	24.8	0.699	5.96	24.6																
71	4/02/2025	MW4	AFR & TD		7.22	4.28	24.7	0.256	5.98	65.3																
72	4/02/2025	Ext1	AFR & TD	dry	2.73	0.25																				
73	4/02/2025	Ext2	AFR & TD	dry	3.05	2.41																				
74	4/02/2025	Ext3	AFR & TD	dry	3.07	3.46																				
75	4/02/2025	BY16B	AFR & TD		3.03	11.86																				
76	4/02/2025	BY17B	AFR & TD		10.22	3.85																				
77	4/02/2025	HS73B	AFR & TD		2.66	13.58																				
78	4/02/2025	HS74A	AFR & TD		5.42	2.36																				

APPENDIX H

Laboratory Reports

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Certificate of Analysis PFE0942

Client Details

Client	Hyd2O
Contact	Sasha Martens
Address	Suite 6B, 103 Rokeby Rd, SUBIACO, WA, 6008

Sample Details

Your Reference	
Number of Samples	4 Groundwater
Date Samples Received	14/05/2024
Date Instructions Received	14/05/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date Results Requested by	22/05/2024
Date of Issue	21/05/2024

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Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Authorisation Details

Results Approved By	Ben Carpenter, Metals Technician Heram Halim, Operations Manager Lien Tang, Assistant Operations Manager Michael Mowle, Inorganics Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFE0942-01	MW1	Groundwater	14/05/2024	14/05/2024
PFE0942-02	MW2	Groundwater	14/05/2024	14/05/2024
PFE0942-03	MW3	Groundwater	14/05/2024	14/05/2024
PFE0942-04	MW4	Groundwater	14/05/2024	14/05/2024

Acid Extractable Metals (Groundwater)

Envirolab ID	Units	PQL	PFE0942-01	PFE0942-02	PFE0942-03	PFE0942-04
Your Reference			MW1	MW2	MW3	MW4
Date Sampled			14/05/2024	14/05/2024	14/05/2024	14/05/2024
Phosphorus	mg/L	0.050	0.054	<0.050	<0.050	<0.050

Dissolved Low Level Metals (Groundwater)

Envirolab ID	Units	PQL	PFE0942-01	PFE0942-02	PFE0942-03	PFE0942-04
Your Reference			MW1	MW2	MW3	MW4
Date Sampled			14/05/2024	14/05/2024	14/05/2024	14/05/2024
Arsenic	µg/L	1.0	<1.0	1.4	<1.0	<1.0
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Mercury	µg/L	0.050	<0.050	<0.050	<0.050	<0.050
Nickel	µg/L	1.0	<1.0	3.2	<1.0	3.0
Lead	µg/L	1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	<1.0	1.4	<1.0	8.6

Inorganics - Ionic Balance and Indexes (Groundwater)

Envirolab ID	Units	PQL	PFE0942-01	PFE0942-02	PFE0942-03	PFE0942-04
Your Reference			MW1	MW2	MW3	MW4
Date Sampled			14/05/2024	14/05/2024	14/05/2024	14/05/2024
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	120	140	28	15
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	120	140	28	15

Inorganics - Nutrients (Groundwater)

Envirolab ID	Units	PQL	PFE0942-01	PFE0942-02	PFE0942-03	PFE0942-04
Your Reference			MW1	MW2	MW3	MW4
Date Sampled			14/05/2024	14/05/2024	14/05/2024	14/05/2024
Ammonia as N	mg/L	0.0050	<0.050 [2]	0.22	0.0093	<0.0050
Nitrate as N	mg/L	0.0050	<0.050 [2]	<0.050 [2]	3.7	6.6
Nitrate as NO3 by calculation	mg/L	0.020	<0.20 [2]	<0.20 [2]	16	29
Nitrite as N	mg/L	0.0050	<0.050 [2]	<0.050 [2]	<0.0050	<0.0050
Nitrite as NO2 by calculation	mg/L	0.020	<0.20 [2]	<0.20 [2]	<0.020	<0.020
NOx as N	mg/L	0.0050	<0.050 [2]	<0.050 [2]	3.7	6.6
TKN as N by calculation	mg/L	0.10	0.80	0.35	0.48	0.90
Organic Nitrogen by calc.	mg/L	0.10	0.79	0.13	0.47	0.90
Total Nitrogen	mg/L	0.10	0.81	0.36	4.2	7.5
Phosphate as P	mg/L	0.0050	<0.050 [2]	<0.050 [2]	0.011	<0.0050

Result Comments

Identifier	Description
[2]	PQL(s) has/have been raised due to matrix interference.

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - TKN	TKN determined by calculation (Total Nitrogen - NOx).
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	Ammonia - determined colourimetrically. Water samples are filtered on receipt prior to analysis. Soils and OHS media are analysed following a water extraction. Alternatively, Ammonia can be extracted from soil using 1M KCl.
INORG-060	Phosphate - determined colourimetrically using APHA latest edition 4500 P E. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Client Details

Client	Hyd2O
Your Reference	
Date Issued	21/05/2024

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Total Phosphorus | Water	1-4	14/05/2024	15/05/2024	15/05/2024	Yes
Dissolved Metals (LL) | Water	1-4	14/05/2024	17/05/2024	20/05/2024	Yes
Dissolved Metals (LL)-Hg | Water	1-4	14/05/2024	16/05/2024	16/05/2024	Yes
Alkalinity Suite | Water	1-4	14/05/2024	15/05/2024	16/05/2024	Yes
Nitrogen - Ammonia | Water	3-4	14/05/2024	16/05/2024	16/05/2024	Yes
	1-2	14/05/2024	16/05/2024	17/05/2024	Yes
Nitrogen - Nitrate | Water	3-4	14/05/2024	16/05/2024	16/05/2024	Yes
	1-2	14/05/2024	16/05/2024	17/05/2024	Yes
Nitrogen - Nitrite | Water	3-4	14/05/2024	16/05/2024	16/05/2024	Yes
	1-2	14/05/2024	16/05/2024	17/05/2024	Yes
Nitrogen - NOx | Water	3-4	14/05/2024	16/05/2024	16/05/2024	Yes
	1-2	14/05/2024	16/05/2024	17/05/2024	Yes
Nitrogen - Total N | Water	1-4	14/05/2024	15/05/2024	15/05/2024	Yes
Phosphate as P | Water	3-4	14/05/2024	16/05/2024	16/05/2024	Yes
	1-2	14/05/2024	16/05/2024	17/05/2024	Yes
TKN as N calc | Water	1-4	14/05/2024	15/05/2024	21/05/2024	Yes

Outliers: Matrix Spike

METALS-021|Dissolved Low Level Metals (Water)| Batch BFE2580

Sample ID	Analyte	% Limits	% Recovery
BFE2580-MS1#	Mercury	70 - 130	68.0[1]

METALS-020|Acid Extractable Metals (Water) | Batch BFE2443

Analyte	Units	PQL	Blank	DUP1 BFE2443-DUP1# Samp | QC | RPD %	LCS %	Spike % PFE0942-01
Phosphorus	mg/L	0.050	<0.050	<0.10 | <0.10 | [NA]	100	95.2

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-021|Dissolved Low Level Metals (Water) | Batch BFE2580

Analyte	Units	PQL	Blank	DUP1 BFE2580-DUP1# Samp | QC | RPD %	DUP2 BFE2580-DUP2# Samp | QC | RPD %	LCS %	Spike % BFE2580-MS1#
Mercury	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	97.6	68.0[1]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022|Dissolved Low Level Metals (Water) | Batch BFE2866

Analyte	Units	PQL	Blank	DUP1 BFE2866-DUP1# Samp | QC | RPD %	DUP2 BFE2866-DUP2# Samp | QC | RPD %	LCS %	Spike % BFE2866-MS1#
Arsenic	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	103	103
Cadmium	µg/L	0.10	<0.10	0.360 | 0.350 | 2.82	<0.10 | <0.10 | [NA]	103	97.3
Chromium	µg/L	1.0	<1.0	5.86 | 5.52 | 5.98	<1.0 | <1.0 | [NA]	104	101
Copper	µg/L	1.0	<1.0	4.16 | 3.97 | 4.67	<1.0 | <1.0 | [NA]	102	94.8
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	99.9	91.7
Nickel	µg/L	1.0	<1.0	5.04 | 4.58 | 9.56	<1.0 | <1.0 | [NA]	103	91.0
Zinc	µg/L	1.0	<1.0	73.6 | 71.2 | 3.44	3.74 | 4.36 | 15.1	104	92.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006|Inorganics - Ionic Balance and Indexes (Water) | Batch BFE2316

Analyte	Units	PQL	Blank	DUP1 PFE0942-01 Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	124 | 125 | 1.21	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	124 | 125 | 1.21	[NA]

Analyte	Units	PQL	Blank	LCS %
Total Alkalinity as CaCO3	mg/L as CaCO3	5		94.5

INORG-127|Inorganics - Nutrients (Water) | Batch BFE2257

Analyte	Units	PQL	Blank	DUP1 BFE2257-DUP1# Samp | QC | RPD %	LCS %	Spike % BFE2257-MS1#
Total Nitrogen	mg/L	0.10	<0.10	0.804 | 0.818 | 1.64	105	92.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BFE2556

Analyte	Units	PQL	Blank	DUP1 BFE2556-DUP1# Samp | QC | RPD %	DUP2 BFE2556-DUP2# Samp | QC | RPD %	LCS %	Spike % BFE2556-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.00588 | 0.00588 | 0.0850	<0.0050 | <0.0050 | [NA]	91.8	97.1
Nitrate as N	mg/L	0.0050	<0.0050	0.275 | 0.289 | 4.70	<0.0050 | <0.0050 | [NA]	103	125
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	82.1	94.0
Nitrite as NO2 by calculation	mg/L	0.020	<0.020			[NA]	[NA]
NOx as N	mg/L	0.0050	<0.0050	0.277 | 0.290 | 4.68	<0.0050 | <0.0050 | [NA]	103	124
Phosphate as P	mg/L	0.0050	<0.0050	<0.0050 | <0.0050 | [NA]	<0.0050 | <0.0050 | [NA]	106	124

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

QC Comments

Identifier	Description
[1]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.

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Certificate of Analysis PFH0790

Client Details

Client	Hyd2O
Contact	Andre Righetti
Address	Suite 6B, 103 Rokeby Rd, SUBIACO, WA, 6008

Sample Details

Your Reference	H24008 Millbridge Monitoring
Number of Samples	7 Groundwater
Date Samples Received	13/08/2024
Date Instructions Received	13/08/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	20/08/2024
Date of Issue	20/08/2024

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Authorisation Details

Results Approved By	Lien Tang, Assistant Operations Manager Lucas Yii, Inorganics Team Leader Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFH0790-01	MW1	Groundwater	13/08/2024	13/08/2024
PFH0790-02	MW2	Groundwater	13/08/2024	13/08/2024
PFH0790-03	MW3	Groundwater	13/08/2024	13/08/2024
PFH0790-04	MW4	Groundwater	13/08/2024	13/08/2024
PFH0790-05	Ext1	Groundwater	13/08/2024	13/08/2024
PFH0790-06	Ext2	Groundwater	13/08/2024	13/08/2024
PFH0790-07	Ext3	Groundwater	13/08/2024	13/08/2024

Acid Extractable Metals (Groundwater)

Envirolab ID	Units	PQL	PFH0790-01	PFH0790-02	PFH0790-03	PFH0790-04	PFH0790-05
Your Reference			MW1	MW2	MW3	MW4	Ext1
Date Sampled			13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Phosphorus	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Envirolab ID	Units	PQL	PFH0790-06	PFH0790-07
Your Reference			Ext2	Ext3
Date Sampled			13/08/2024	13/08/2024
Phosphorus	mg/L	0.050	<0.050	0.093

Dissolved Low Level Metals (Groundwater)

Envirolab ID	Units	PQL	PFH0790-01	PFH0790-02	PFH0790-03	PFH0790-04	PFH0790-05
Your Reference			MW1	MW2	MW3	MW4	Ext1
Date Sampled			13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Arsenic	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	µg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	1.0	2.8	1.0	<1.0	<1.0	<1.0
Mercury	µg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Nickel	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lead	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	µg/L	1.0	<1.0	2.0	<1.0	2.1	1.1

Envirolab ID	Units	PQL	PFH0790-06	PFH0790-07
Your Reference			Ext2	Ext3
Date Sampled			13/08/2024	13/08/2024
Arsenic	µg/L	1.0	<1.0	<1.0
Cadmium	µg/L	0.10	<0.10	<0.10
Chromium	µg/L	1.0	<1.0	<1.0
Copper	µg/L	1.0	<1.0	<1.0
Mercury	µg/L	0.050	<0.050	<0.050
Nickel	µg/L	1.0	<1.0	<1.0
Lead	µg/L	1.0	<1.0	<1.0
Zinc	µg/L	1.0	1.4	2.4

Inorganics - Ionic Balance and Indexes (Groundwater)

Envirolab ID	Units	PQL	PFH0790-01	PFH0790-02	PFH0790-03	PFH0790-04	PFH0790-05
Your Reference			MW1	MW2	MW3	MW4	Ext1
Date Sampled			13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	59	130	43	13	42
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	59	130	43	13	42

Envirolab ID	Units	PQL	PFH0790-06	PFH0790-07
Your Reference			Ext2	Ext3
Date Sampled			13/08/2024	13/08/2024
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	15	43
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	15	43

Inorganics - Nutrients (Groundwater)

Envirolab ID	Units	PQL	PFH0790-01	PFH0790-02	PFH0790-03	PFH0790-04	PFH0790-05
Your Reference			MW1	MW2	MW3	MW4	Ext1
Date Sampled			13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Ammonia as N	mg/L	0.0050	0.027	0.12	0.014	0.034	0.026
Nitrate as N	mg/L	0.0050	0.72	0.018	6.4	6.1	0.026
Nitrate as NO3 by calculation	mg/L	0.020	3.2	0.078	28	27	0.12
Nitrite as N	mg/L	0.0050	0.025	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite as NO2 by calculation	mg/L	0.020	0.081	<0.020	<0.020	<0.020	<0.020
NOx as N	mg/L	0.0050	0.75	0.018	6.4	6.1	0.026
TKN as N by calculation	mg/L	0.10	0.11	0.36	0.20	0.19	0.17
Organic Nitrogen by calc.	mg/L	0.10	<0.10	0.23	0.18	0.16	0.15
Total Nitrogen	mg/L	0.10	0.86	0.37	6.6	6.3	0.20
Phosphate as P	mg/L	0.0050	<0.0050	0.0084	0.0056	<0.0050	0.0096

Envirolab ID	Units	PQL	PFH0790-06	PFH0790-07
Your Reference			Ext2	Ext3
Date Sampled			13/08/2024	13/08/2024
Ammonia as N	mg/L	0.0050	0.014	0.16
Nitrate as N	mg/L	0.0050	3.9	0.0068
Nitrate as NO3 by calculation	mg/L	0.020	17	0.030
Nitrite as N	mg/L	0.0050	<0.0050	<0.0050
Nitrite as NO2 by calculation	mg/L	0.020	<0.020	<0.020
NOx as N	mg/L	0.0050	3.9	0.0068
TKN as N by calculation	mg/L	0.10	0.16	0.62
Organic Nitrogen by calc.	mg/L	0.10	0.15	0.46
Total Nitrogen	mg/L	0.10	4.1	0.63
Phosphate as P	mg/L	0.0050	0.0058	0.028

Method Summary

Method ID	Methodology Summary
Calc	Calculation
Calc - TKN	TKN determined by calculation (Total Nitrogen - NOx).
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition 2320-B. Solids reported from a 1:5 water extract unless otherwise specified. Total Carbon Dioxide - determined by calculation in accordance with APHA latest edition,4500-CO2 D.
INORG-055	Nitrate/Nitrite/NOx/TKN - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils/solids are analysed following a water extraction.
INORG-057	Ammonia - determined colourimetrically. Water samples are filtered on receipt prior to analysis. Soils and OHS media are analysed following a water extraction. Alternatively, Ammonia can be extracted from soil using 1M KCl.
INORG-060	Phosphate - determined colourimetrically using APHA latest edition 4500 P E. Water samples are filtered on receipt prior to analysis. Soils are analysed from a water extract.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Organic Carbon forms (inorganic, organic, total) determined using a TOC/NDIR analyser via combustion. Dissolved forms require filtering prior to determination.
METALS-020	Determination of various metals by ICP-OES.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary - TH0790

Client Details

Client	Hyd2O
Your Reference	H24008 Millbridge Monitoring
Date Issued	20/08/2024

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	No	Matrix Spike Outliers Exist - See detailed list below
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Total Phosphorus | Water	1-7	13/08/2024	15/08/2024	20/08/2024	Yes
Dissolved Metals (LL) | Water	1-7	13/08/2024	15/08/2024	16/08/2024	Yes
Dissolved Metals (LL)-Hg | Water	1-7	13/08/2024	14/08/2024	15/08/2024	Yes
Alkalinity Suite | Water	1-7	13/08/2024	15/08/2024	15/08/2024	Yes
Nitrogen - Ammonia | Water	1-7	13/08/2024	15/08/2024	15/08/2024	Yes
Nitrogen - Nitrate | Water	1-7	13/08/2024	15/08/2024	15/08/2024	Yes
Nitrogen - Nitrite | Water	1-7	13/08/2024	15/08/2024	15/08/2024	Yes
Nitrogen - NOx | Water	1-7	13/08/2024	15/08/2024	15/08/2024	Yes
Nitrogen - Total N | Water	6-7	13/08/2024	15/08/2024	15/08/2024	Yes
	1-5	13/08/2024	15/08/2024	16/08/2024	Yes
Phosphate as P | Water	1-7	13/08/2024	15/08/2024	15/08/2024	Yes
TKN as N calc | Water	1-7	13/08/2024	19/08/2024	20/08/2024	Yes

Outliers: Matrix Spike

INORG-060|Inorganics - Nutrients (Water)| Batch BFH2686

Sample ID	Analyte	% Limits	% Recovery
BFH2686-MS1#	Phosphate as P	70 - 130	##[1]

METALS-020 | Acid Extractable Metals (Water) | Batch BFH2570

Analyte	Units	PQL	Blank	DUP2 PFH0790-06 Samp | QC | RPD %	LCS %
Phosphorus	mg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	104

METALS-021 | Dissolved Low Level Metals (Water) | Batch BFH2465

Analyte	Units	PQL	Blank	DUP1 BFH2465-DUP1# Samp | QC | RPD %	DUP2 BFH2465-DUP2# Samp | QC | RPD %	LCS %	Spike % BFH2465-MS1#
Mercury	µg/L	0.050	<0.050	<0.050 | <0.050 | [NA]	<0.050 | <0.050 | [NA]	108	96.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022 | Dissolved Low Level Metals (Water) | Batch BFH2576

Analyte	Units	PQL	Blank	DUP1 BFH2576-DUP1# Samp | QC | RPD %	DUP2 PFH0790-03 Samp | QC | RPD %	LCS %	Spike % BFH2576-MS1#
Arsenic	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	102	109
Cadmium	µg/L	0.10	<0.10	<0.10 | <0.10 | [NA]	<0.10 | <0.10 | [NA]	102	106
Chromium	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	102	106
Copper	µg/L	1.0	<1.0	3.44 | 3.47 | [NA]	<1.0 | <1.0 | [NA]	99.0	102
Lead	µg/L	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	93.7	94.4
Nickel	µg/L	1.0	<1.0	2.29 | 2.29 | [NA]	<1.0 | <1.0 | [NA]	99.3	101
Zinc	µg/L	1.0	<1.0	55.7 | 55.0 | 1.13	<1.0 | <1.0 | [NA]	101	107

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-006 | Inorganics - Ionic Balance and Indexes (Water) | Batch BFH2500

Analyte	Units	PQL	Blank	DUP1 BFH2500-DUP1# Samp | QC | RPD %	DUP2 BFH2500-DUP2# Samp | QC | RPD %	LCS %
Bicarbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	299 | 291 | 2.69	106 | 114 | 7.23	[NA]
Carbonate Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Hydroxide OH- as CaCO3	mg/L as CaCO3	5.0	<5.0	<5.0 | <5.0 | [NA]	<5.0 | <5.0 | [NA]	[NA]
Total Alkalinity as CaCO3	mg/L as CaCO3	5.0	<5.0	299 | 291 | 2.69	106 | 114 | 7.23	92.9

Analyte	Units	PQL	Blank	LCS %
Total Alkalinity as CaCO3	mg/L as CaCO3	5		101

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BFH2654

Analyte	Units	PQL	Blank	DUP1 BFH2654-DUP1# Samp | QC | RPD %	DUP2 BFH2654-DUP2# Samp | QC | RPD %	LCS %	Spike % BFH2654-MS1#
Total Nitrogen	mg/L	0.10	<0.10	0.443 | 0.372 | [NA]	4.23 | 4.35 | 2.69	112	104

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-127 | Inorganics - Nutrients (Water) | Batch BFH2655

Analyte	Units	PQL	Blank	DUP1 PFH0790-05 Samp | QC | RPD %	DUP2 BFH2655-DUP2# Samp | QC | RPD %	LCS %	Spike % PFH0790-06
Total Nitrogen	mg/L	0.10	<0.10	0.197 | 0.216 | [NA]	0.525 | 0.432 | [NA]	103	94.7

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-057 | Inorganics - Nutrients (Water) | Batch BFH2686

Analyte	Units	PQL	Blank	DUP1 BFH2686-DUP1# Samp | QC | RPD %	DUP2 PFH0790-07 Samp | QC | RPD %	LCS %	Spike % BFH2686-MS1#
Ammonia as N	mg/L	0.0050	<0.0050	0.0111 | 0.00930 | [NA]	0.165 | 0.156 | 5.49	95.7	124
Nitrate as N	mg/L	0.0050	<0.0050	3.97 | 3.87 | 2.68	0.00682 | 0.00615 | [NA]	115	94.0
Nitrate as NO3 by calculation	mg/L	0.020	<0.020			[NA]	[NA]
Nitrite as N	mg/L	0.0050	<0.0050	0.0148 | 0.0230 | [NA] [2]	<0.0050 | <0.0050 | [NA]	105	122
Nitrite as NO2 by calculation	mg/L	0.020	<0.020			[NA]	[NA]
NOx as N	mg/L	0.0050	<0.0050	3.99 | 3.89 | 2.46	0.00682 | 0.00615 | [NA]	115	94.0
Phosphate as P	mg/L	0.0050	<0.0050	0.0536 | 0.0513 | 4.25	0.0277 | 0.0259 | 6.86	100	##[1]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

QC Comments

Identifier	Description
[1]	Spike recovery is outside routine acceptance criteria (70-130%), this may be due to suspected non-homogeneity and/or matrix interference effects. However, an acceptable recovery was achieved for the LCS.
[2]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

APPENDIX I

Water Register Extracts

Date : 12/11/2024 Job No: H23088

LOT 3001 ON PLAN 38067

Resources 3 | Licences 2

RESOURCES | LICENCES

Area: **Bunbury**
Subarea: **Dardanup**
Aquifer: **Perth - Superficial Swan**
Level: **1**

Area: **Bunbury**
Subarea: **Dardanup**
Aquifer: **Perth - Leederville.**
Level: **2**

Area: **Bunbury**
Subarea: **Bunbury-Yarragadee**
Aquifer: **Perth - Yarragadee South.**
Level: **3**

Resource Legend

Water availability is shown as a combination of resource type and colour:

Surface water | Groundwater

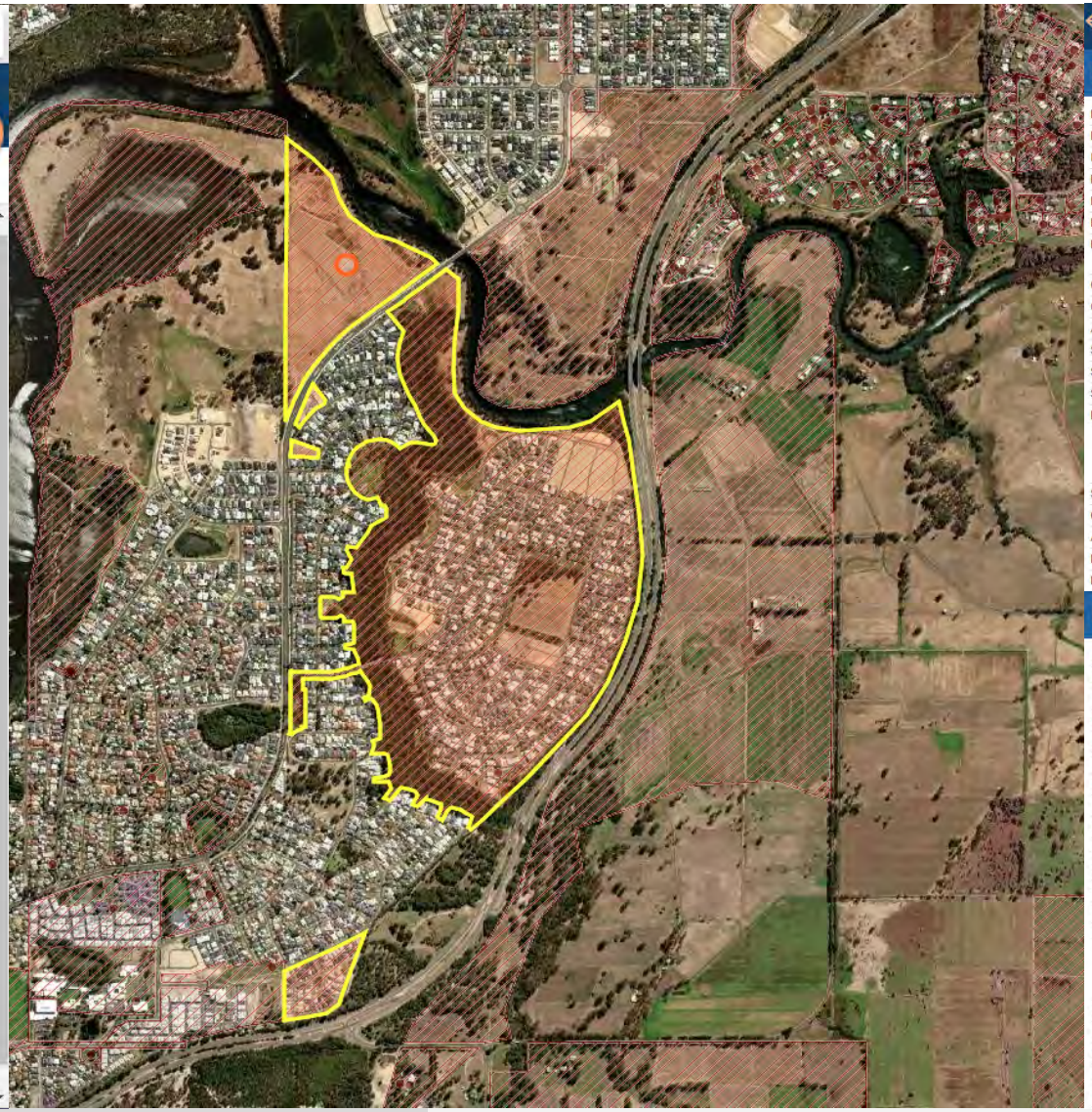
- Allocation Available
- Fully Allocated
- Limited Information

Water Availability Disclaimer

Water availability gives a general indication as to whether water is still available in a resource for licensing. It is determined from the amount of water that may be available to take sustainably from a resource, minus water that has already been allocated or committed to licensed users.

However, additional applications may already be under assessment to access the remaining water, and water availability ***does not*** reflect the water that may be assigned to these applications until they are finalised.

This information changes on a daily basis. To discuss water availability for your resource, please contact your regional licensing office.



Licence details

Selected 1 of 2

Licence Number:	109152
Licence Type:	Groundwater Licence
Issue Date:	18/1/2016
Expiry Date:	31/12/2025
Licence Allocation:	139000 KL
Parties:	Ardross Estates (S.A.) Pty Ltd
Postal Address:	PO BOX 353 West Perth WA 6872 Australia
Groundwater Area:	Bunbury
Groundwater Subarea:	Dardanup
Aquifer:	Perth - Leederville.
Surface Water Area:	
Surface Water Subarea:	
Surface Water Resource:	
Licence Address:	Public Open Space within Millbridge Estate, Eaton; Lot 2000 On Plan 66487 Volume/Folio Lr3159/355 Lot 2000 Duncan Loop Millbridge
Security Interests:	No
Convictions:	No
Agreements:	No
Notations:	No
Directions:	No

Selected 2 of 2

Licence Number:	171479
Licence Type:	Groundwater Licence
Issue Date:	16/4/2015
Expiry Date:	16/4/2025
Licence Allocation:	139000 KL
Parties:	Shire of Dardanup
Postal Address:	PO BOX 7016 Eaton WA 6232 Australia
Groundwater Area:	Bunbury
Groundwater Subarea:	Bunbury-Yarragadee
Aquifer:	Perth - Yarragadee South.
Surface Water Area:	
Surface Water Subarea:	
Surface Water Resource:	
Licence Address:	Public Open Space within Millbridge Estate, Eaton; Lot 12 On Plan 38067 Volume/Folio Lr3128/787 Lot 12 Millbridge
Security Interests:	No
Convictions:	No
Agreements:	No
Notations:	No
Directions:	No

APPENDIX J
Landscape Plan

Millbridge Southbank POS

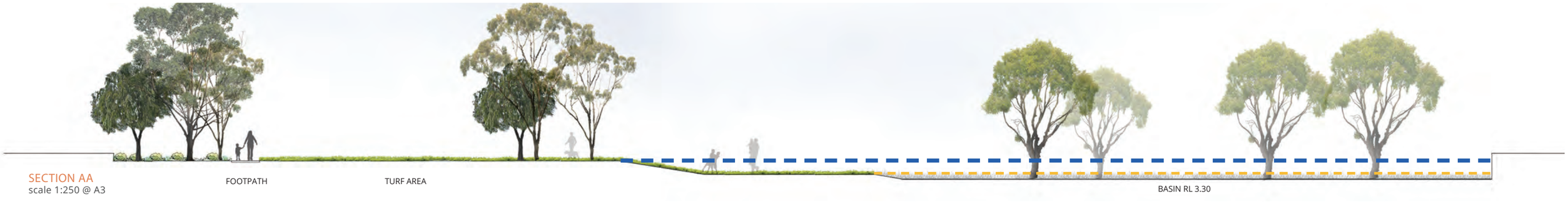
Lot 3001 Eaton Drive, Eaton

Legend

1. Sheltered picnic setting and informal log seating adjacent play area
2. Play area with mulch softfall, monkey bars, double swing and nature play elements
3. Turf area
4. Planted drainage basin
5. Garden planting with native species
6. Rock pitching to culverts
7. Universally accessible paths to foreshore

Drainage Basin
Base level @ RL 3.30
TWL 4.50 (Top of Bund)
TWL 3.60

PLAN
scale 1:500 @ A3

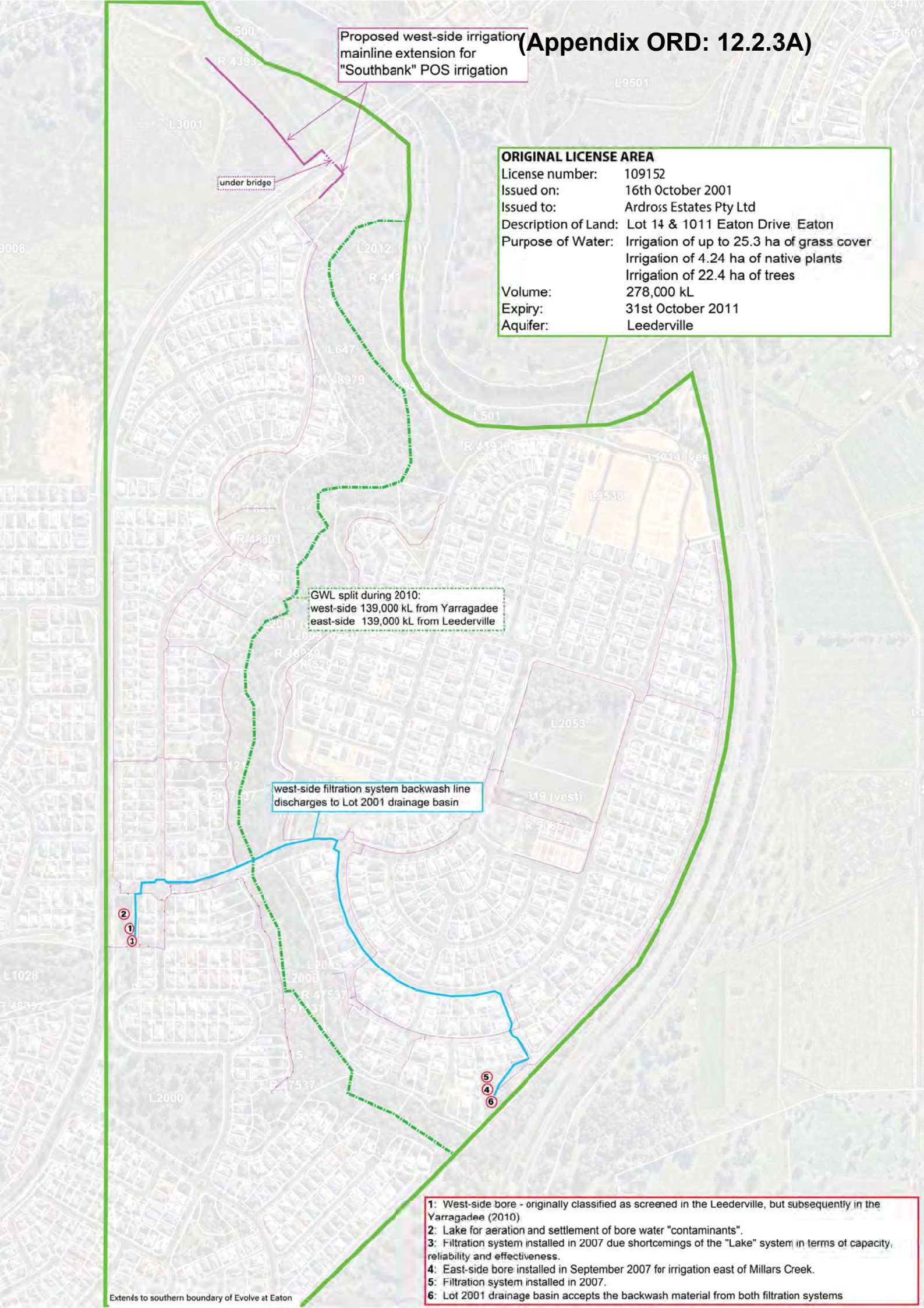


SECTION AA
scale 1:250 @ A3

LD TOTAL

ARDROSS ESTATES	C	11.11.2024	1 OF 1
CLIENT	REVISION	DATE	PAGE

NOTE: Design is subject to detailed design, budget allocation and approval with LGA. POS design subject to water allocation and detailed design to meet LPP requirements.


(Appendix ORD: 12.2.3A)
Proposed west-side irrigation mainline extension for "Southbank" POS irrigation
under bridge
ORIGINAL LICENSE AREA
License number: 109152
Issued on: 16th October 2001
Issued to: Ardross Estates Pty Ltd
Description of Land: Lot 14 & 1011 Eaton Drive, Eaton
Purpose of Water: Irrigation of up to 25.3 ha of grass cover
Irrigation of 4.24 ha of native plants
Irrigation of 22.4 ha of trees
Volume: 278,000 kL
Expiry: 31st October 2011
Aquifer: Leederville
GWL split during 2010:
west-side 139,000 kL from Yarragadee
east-side 139,000 kL from Leederville
west-side filtration system backwash line discharges to Lot 2001 drainage basin
Extends to southern boundary of Evolve at Eaton
1: West-side bore - originally classified as screened in the Leederville, but subsequently in the Yarragadee (2010).
2: Lake for aeration and settlement of bore water "contaminants".
3: Filtration system installed in 2007 due shortcomings of the "Lake" system in terms of capacity, reliability and effectiveness.
4: East-side bore installed in September 2007 for irrigation east of Millars Creek.
5: Filtration system installed in 2007.
6: Lot 2001 drainage basin accepts the backwash material from both filtration systems

(Appendix ORD: 12.2.3A)

From: "Nathan Ryder" <Nathan.Ryder@dardanup.wa.gov.au>
To: "Daniel Skerratt" <dskerratt@ardross.com>
Cc: "John L Waring" <JWaring@ardross.com>, "Theo Naudé" <Theo.Naude@dardanup.wa.gov.au>, "André van der Merwe" <Andre.vanderMerwe@dardanup.wa.gov.au>, "Nigel Lyon" <Nigel.Lyon@dardanup.wa.gov.au>, "Andrew Coulson" <Andrew.Coulson@dardanup.wa.gov.au>
Date: 29/07/2024 12:30 PM
Subject: RE: MillBridge Bore - Lot 2000

Hi Daniel,

I have received confirmation from the CEO that the Shire will allow extension of the Millbridge irrigation system to Southbank.

Kind regards,

Nathan Ryder
Manager Infrastructure Planning & Design

A: 1 Council Drive | PO Box 7016 | Eaton WA 6232
T: 08 9724 0393 | **M:** 0447 781 021 | **E:**

Nathan.Ryder@dardanup.wa.gov.au **W:** www.dardanup.wa.gov.au

---

From: Daniel Skerratt dskerratt@ardross.com
Sent: Tuesday, April 16, 2024 10:53 AM
To: Nathan Ryder Nathan.Ryder@dardanup.wa.gov.au
Cc: John L Waring <JWaring@ardross.com>

Subject: RE: MillBridge Bore - Lot 2000

Hi Nathan,

I'm following up the Shire's request in light of last week's meeting between David Lantzke (Ardross CEO), John Waring, Andre and the Shire President.

I am told that Andre was under the impression that the Shire would not be able to accommodate an extension of the Millbridge irrigation system to the proposed POS areas in the western areas of the Structure Plan (Lot 3001 - Southbank).

Can you please confirm the Shire's position and provide an update on the progress of the irrigation planning for Millbridge?

Kind regards,
Daniel

Daniel Skerratt | Development Manager
Ardross Group of Companies
The Park, 45 Ventnor Ave, West Perth
PO Box 353, West Perth WA 6872
Mobile 0408 924 444 | Office 6118 4595

From: Daniel Skerratt/Ardross Estates Pty Ltd/AU
To: "Nathan Ryder" <Nathan.Ryder@dardanup.wa.gov.au>
Date: 18/10/2023 12:13 PM
Subject: RE: MillBridge Bore - Lot 2000

Hi Nathan,

I'm well thanks, hope you are too.

I confirm we have no objection in principle to the Shire leasing a portion of our unused water allocation. A condition precedent for the lease is an agreement between the Shire and Ardross formalising our requirement that the irrigation for our future development areas will be serviced by extension of the existing irrigation infrastructure in Millbridge, and the water allocation necessary to irrigate the future development areas is accommodated within Shire's license for the Millbridge bore at no cost to Ardross.

Kind Regards,
Daniel

Daniel Skerratt | Development Manager
Ardross Group of Companies
The Park, 45 Ventnor Ave, West Perth
PO Box 353, West Perth WA 6872
Mobile 0408 924 444 | Office 6118 4595

Hi Nathan

Attached is a copy of the original licence, dated October 2001. It is for Lots 14 & 1011 Eaton Drive. Lot 3000 was subdivided off Lot 1011 in 2002, and Lot 3001 (Southbank) was subdivided off Lot 3000 in 2003.

As previously advised, there was one licence issued for the whole Estate. We added a second bore (on Lot 2000) east of Millars Creek to facilitate irrigation of the development on the east side of Millars Creek. Department of Water subsequently re-classified the depth of the aquifers in the region, specifically the Leederville and the Yarragadee. As a result, the front bore was determined to be screened in the Yarragadee and therefore, because the bores were in different aquifers, the original licence needed to be split into two.

We designated half the original allocation to the area west of Millars Creek (ie. including Southbank) and the other half to the area east of Millars Creek - refer attached correspondence.

We will retain control of the allocation for GWL109152 and the infrastructure until we have completed our development and maintenance requirements.

Regards
Daniel

Daniel Skerratt | Development Manager
Ardross Group of Companies
The Park, 45 Ventnor Ave, West Perth

PO Box 353, West Perth WA 6872
Mobile 0408 924 444 | Office 6118 4595

From: "Nathan Ryder" <Nathan.Ryder@dardanup.wa.gov.au>
To: "dskerratt@ardross.com" <dskerratt@ardross.com>
Date: 11/05/2023 09:58 AM
Subject: RE: MillBridge Bore - Lot 2000

Hi Daniel,

Just going back to your email 11/8/2022 (below in this email), are you able to dig up some documentation in regards to the irrigation of Southbank; that it was included in the original allocation of water and infrastructure for Millbridge west of Millars Creek (PB1 – GWL 171479)?

I will need to be able to demonstrate this to the Shire Exec. Apologies, I know it was a very long time ago!

Regarding PB2 (GWL 109152) in east Millbridge, is Ardross able to consider transfer of the 139,000kL allocation over to the Shire now?

The handover of the bore infrastructure could be handed when the development work is finished, which may still be a couple of years' away.

Regards,

Nathan

Nathan Ryder
Manager Infrastructure Planning & Design

A: 1 Council Drive | PO Box 7016 | Eaton WA 6232
T: 08 9724 0393 | **M:** 0447 781 021 | **E:** nathan.ryder@dardanup.wa.gov.au

W: www.dardanup.wa.gov.au

From: Daniel Skerratt <dskerratt@ardross.com>
Sent: Thursday, 11 August 2022 4:15 PM
To: Nathan Ryder <Nathan.Ryder@dardanup.wa.gov.au>
Subject: RE: MillBridge Bore - Lot 2000

Hi Nathan

It was planned to irrigate the POS area in Southbank from the existing MillBridge irrigation infrastructure. The whole of our development area was included in our application to justify the original allocation of water and the infrastructure we installed was sized to irrigate the entire development.

I made sure David Mort was aware of this and my understanding is that provision has been made to run the mainline extension from across Eaton Drive with conduits installed for this purpose during the Eaton Drive scheme works. This mainline is fed from the bore at the front of Millbridge.

We are unlikely increase the usage of the bore on the east side of the creek much beyond its current volume. There is only minor scope for irrigation in Stage 20.

The Shire may have plans to use some of the allocation for the central POS that is shared with the Department of Education.

I estimate we will be in a position to transfer GWL109152 to the Shire in 2.5 years.

Kind Regards
Daniel Skerratt | Development Manager
Ardross Group of Companies
The Park, 45 Ventnor Ave, West Perth
PO Box 353, West Perth WA 6872
Mobile 0408 924 444 | Office 6118 4595

From: "Nathan Ryder" <Nathan.Ryder@dardanup.wa.gov.au>
To: "Daniel Skerratt" <dskerratt@ardross.com>
Date: 11/08/2022 03:59 PM
Subject: RE: MillBridge Bore - Lot 2000

Hi Daniel,

You have probably already told the Shire, so apologies, but can you please advise how you plan to irrigate the POS in Southbank?

Given you are currently sitting at about 40% of the 139,000 kL allocation under GWL 109152, is the plan to use this spare capacity?

What is your projected total usage of this allocation once Ardross are finished in Eaton/Millbridge?

Do you have an estimated timeframe for transfer of GWL 109152 to the Shire?

I'm meeting with DWER hopefully next week to try and rationalise the Shire's water allocations so this information would be useful.

Kind regards,

Nathan

Nathan Ryder
Manager Infrastructure Planning & Design

A: 1 Council Drive | PO Box 7016 | Eaton WA 6232
T: 08 9724 0393 | **M:** 0447 781 021 | **E:** nathan.ryder@dardanup.wa.gov.au

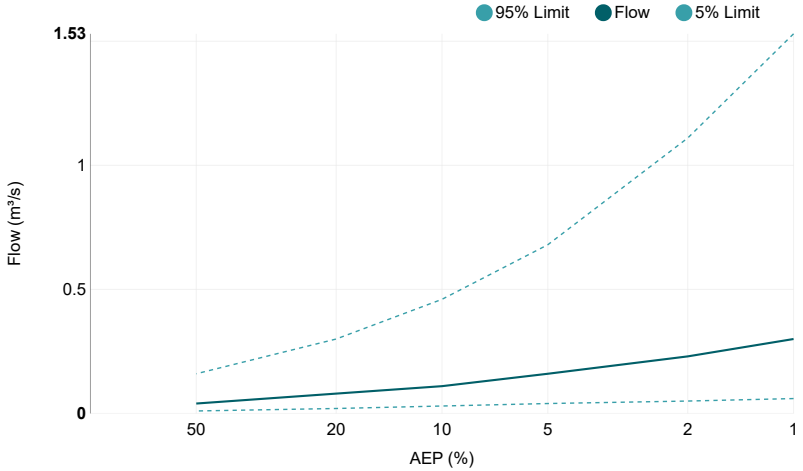
W: www.dardanup.wa.gov.au

APPENDIX K

Pre Development Flow Estimation

(Appendix ORD: 12.2.3A)

Results | Regional Flood Frequency Estimation Model



*The catchment is outside the recommended catchment size of 0.5 to 1,000 km^2. Results have lower accuracy and may not be directly applicable in practice.

AEP (%)	Discharge (m^3/s)	Lower Confidence Limit (5%) (m^3/s)	Upper Confidence Limit (95%) (m^3/s)
50	0.0400	0.0100	0.160
20	0.0800	0.0200	0.300
10	0.110	0.0300	0.460
5	0.160	0.0400	0.680
2	0.230	0.0500	1.11
1	0.300	0.0600	1.53

Statistics

Variable	Value	Standard Dev
Mean	-3.168	0.826
Standard Dev	0.757	0.319
Skew	0.265	0.091

Correlation		
1.000		
-0.280	1.000	
-0.050	-0.070	1.000

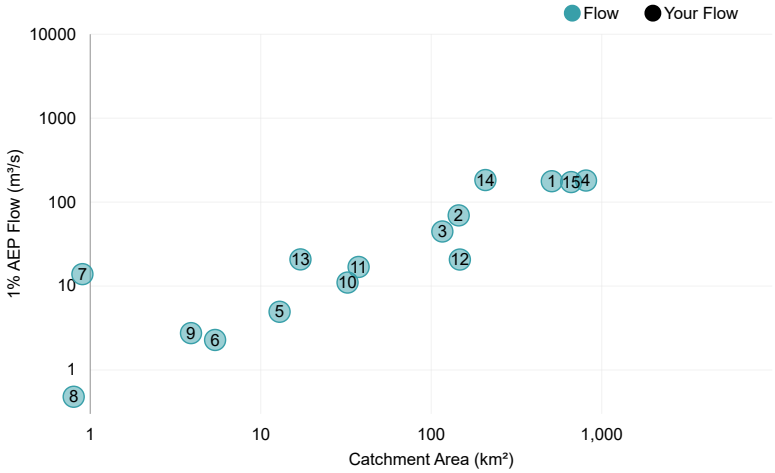
Input Data	
Date/Time	2024-09-30 11:41
Catchment Name	Southbank Millbridge
Latitude (Outlet)	-33.295
Longitude (Outlet)	115.731
Latitude (Centroid)	-33.297
Longitude (Centroid)	115.73
Catchment Area (km^2)	0.1271*
Distance to Nearest Gauged Catchment (km)	5.31
50% AEP 6 Hour Rainfall Intensity (mm/h)	6.1168
2% AEP 6 Hour Rainfall Intensity (mm/h)	12.932798
Rainfall Intensity Source (User/Auto)	Auto
Region	SW WA
Region Version	RFFE Model 2016 v1
Region Source (User/Auto)	Auto
Shape Factor	0.68
Interpolation Method	Natural Neighbour
Bias Correction Value	1.013

(Appendix ORD: 12.2.3A)

Note: These statistics come from the nearest gauged catchment. Details.

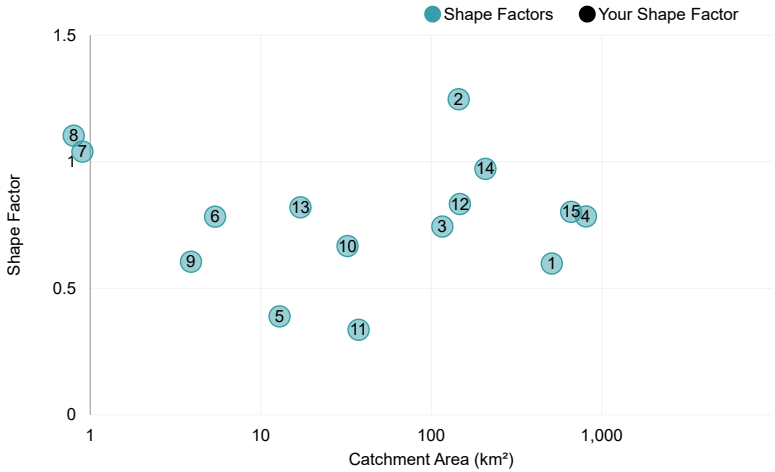
Note: These statistics are common to each region. Details.

1% AEP Flow vs Catchment Area



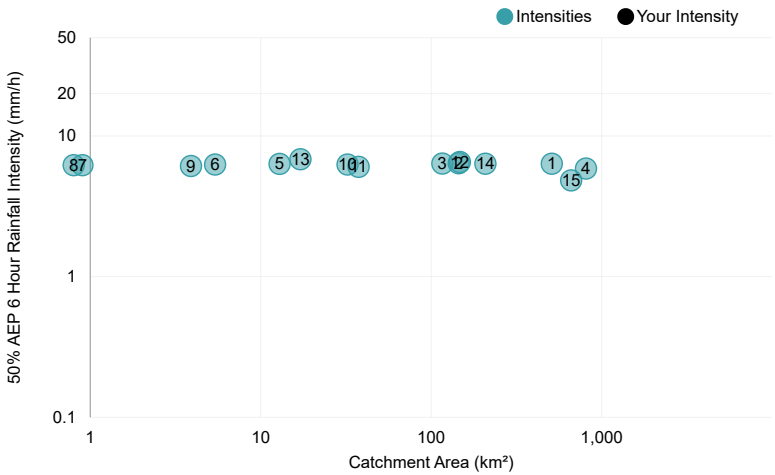
Shape Factor vs Catchment Area

Note: This region does not use shape factors

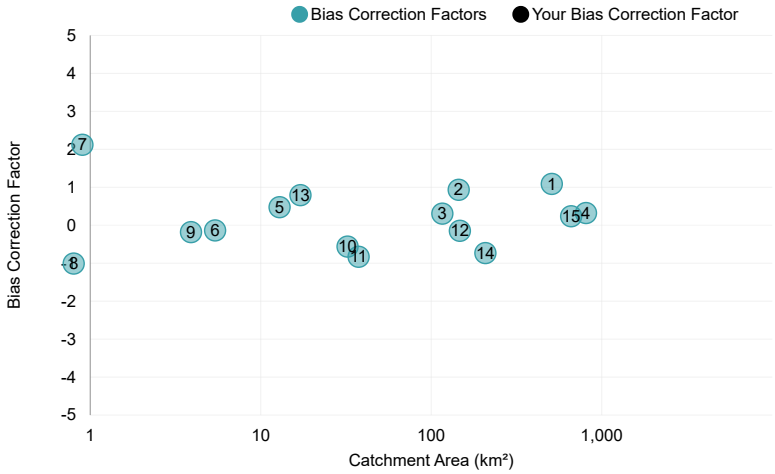


(Appendix ORD: 12.2.3A)

Intensity vs Catchment Area



Bias Correction Factor vs Catchment Area



Method by Dr Ataur Rahman and Dr Khaled Haddad from Western Sydney University for the Australian Rainfall and Runoff Project. Full description of the project can be found at the project page (http://arr.ga.gov.au/revision-projects/project-list/projects/project-5) on the ARR website. Send any questions regarding the method or project here (mailto:admin@arr-software.org).

ENGINEERS AUSTRALIA

WESTERN SYDNEY UNIVERSITY

AR&R 87 Peak Flow Calculator

SOUTH WEST REGION

Catchment name: Lot 3001 Eaton Dr Eaton
Catchment type: Jarrah forest with lateritic soils

RATIONAL METHOD

Catchment area	0.1	km^2
Mainstream length	0.6	km
Slope	16.0	m/km
Catchment cleared	100.0	%

C_{10} = 0.142

t_c = 45.5 mins = 0.8 hours

C10=3.12*10-2 *100.0043CL*(LSe)^0.24

tc=2.31A $^{0.54}$

$Q_y = 0.278\ C_{10}*(C_y/C_{10})\ I_{tc}\ A$

ARI (yrs)	2	5	10	20	50	
C_y/C_{10}	0.81	0.91	1.00	1.10	1.21	
I_{tc} values	27.60	33.50	37.35	43.05	51.00	mm/hr
Q =	**0.11**	**0.15**	**0.19**	**0.24**	**0.31**	**m^3/s**

INDEX FLOOD METHOD

Catchment area	0.1	km^2
Annual rainfall	937.0	mm
Slope	16.0	m/km
Mainstream length	0.6	km
Catchment cleared	100.0	%

Q2 = 0.058

Q2 = 8.22*10-9 A0.73 P 2.22 (LSe)0.28 100.0064CL

$Q_y = Q_2*(Q_y/Q_2)$

ARI (yrs)	2	5	10	20	50	
(Q_y/Q_2)	1.00	1.28	1.50	1.75	2.05	
Q =	**0.06**	**0.07**	**0.09**	**0.10**	**0.12**	**m^3/s**

CURRV

Calculator for Urban Runoff Rates & Volumes

8/11/2024

Project: Lot 3001 Eaton Dr Eaton

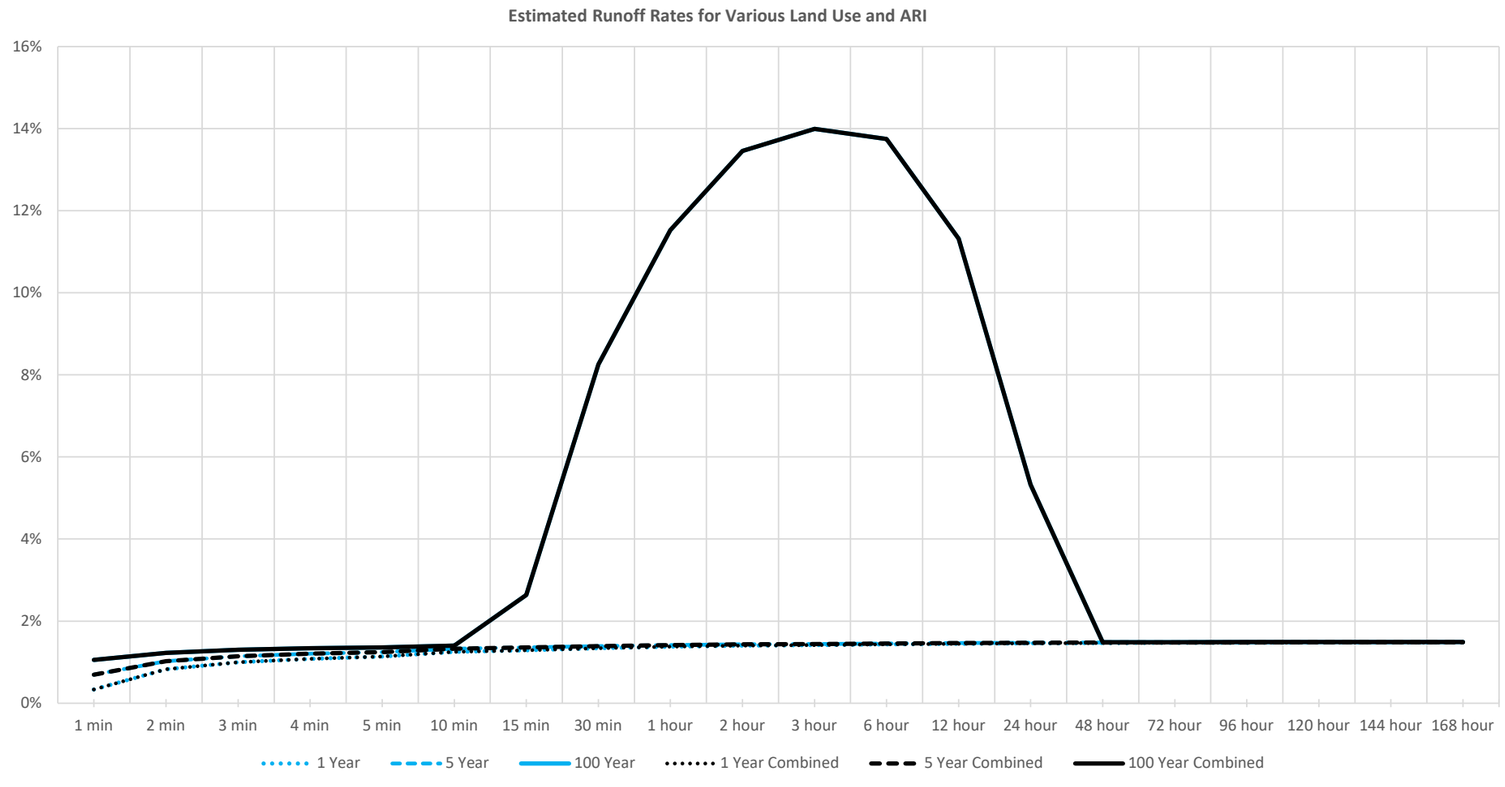
	Land Use Description	Area (ha)	Use in Calc	Imperv Initial Loss mm	Perv Initial Loss mm	Perv Continue Loss mm/hr	On Site Soak (mm)	Empty (days)	AR&R EIA/TIA System Connect Ratio	Roof %	Ext Imp %	Ext Perv %	Comment
1	General Rural	12.71	Yes	1.5	26.0	4.0	0.0	1.00	30%	0	5	95	General pasture
2								1.00					
3								1.00					
4								1.00					
5								1.00					
6								1.00					
7								1.00					
8								1.00					
9								1.00					
10								1.00					

EIA : Effective Impervious Area, TIA : Total Impervious Area

Land Use Graph Selector: **1**

(11 - combined total)

General Rural



Rainfall IFD Data

Annual Exceedence Probability

	Duration	63.2% 1.00	50% 1.44	20% 4.48	10% 10	5% 20	2% 50	1% 100
1	1 min	1.93	2.13	2.78	3.26	3.76	4.46	5.04
2	2 min	3.34	3.65	4.69	5.46	6.25	7.36	8.27
3	3 min	4.46	4.88	6.31	7.35	8.43	9.95	11.2
4	4 min	5.38	5.91	7.67	8.96	10.3	12.2	13.7
5	5 min	6.16	6.78	8.83	10.3	11.9	14.1	15.9
6	10 min	8.91	9.83	12.9	15.1	17.5	20.8	23.5
7	15 min	10.7	11.8	15.5	18.2	21	25	28.2
8	30 min	14.1	15.5	20.3	23.8	27.4	32.6	36.8
9	1 hour	18.1	19.9	25.8	30.2	34.7	41.1	46.4
10	2 hour	22.9	25.1	32.6	38.1	43.9	52	58.7
11	3 hour	26.3	28.9	37.6	44	50.6	60.1	67.8
12	6 hour	33.3	36.7	48	56.4	65.1	77.6	87.8
13	12 hour	42.3	46.6	61.2	72	83.3	99.6	113
14	24 hour	53.5	58.7	76.4	89.5	103	124	141
15	48 hour	67.3	73.2	93	108	123	146	165
16	72 hour	77	83.3	104	119	134	158	177
17	96 hour	85.2	91.7	113	128	143	166	185
18	120 hour	92.5	99.5	122	137	152	174	192
19	144 hour	99.4	107	130	146	161	183	199
20	168 hour	106	114	139	156	171	191	207

Estimated Runoff Rates

Annual Exceedence Probability

	63.2% 1.00	50% 1.44	20% 4.48	10% 10	5% 20	2% 50	1% 100
Maximum of All Events							
General Rural	1%	1%	1%	5%	9%	12%	14%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
combined total	1%	1%	1%	5%	9%	12%	14%

Event Selector	9	1 hour					
General Rural	1%	1%	1%	2%	5%	9%	12%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
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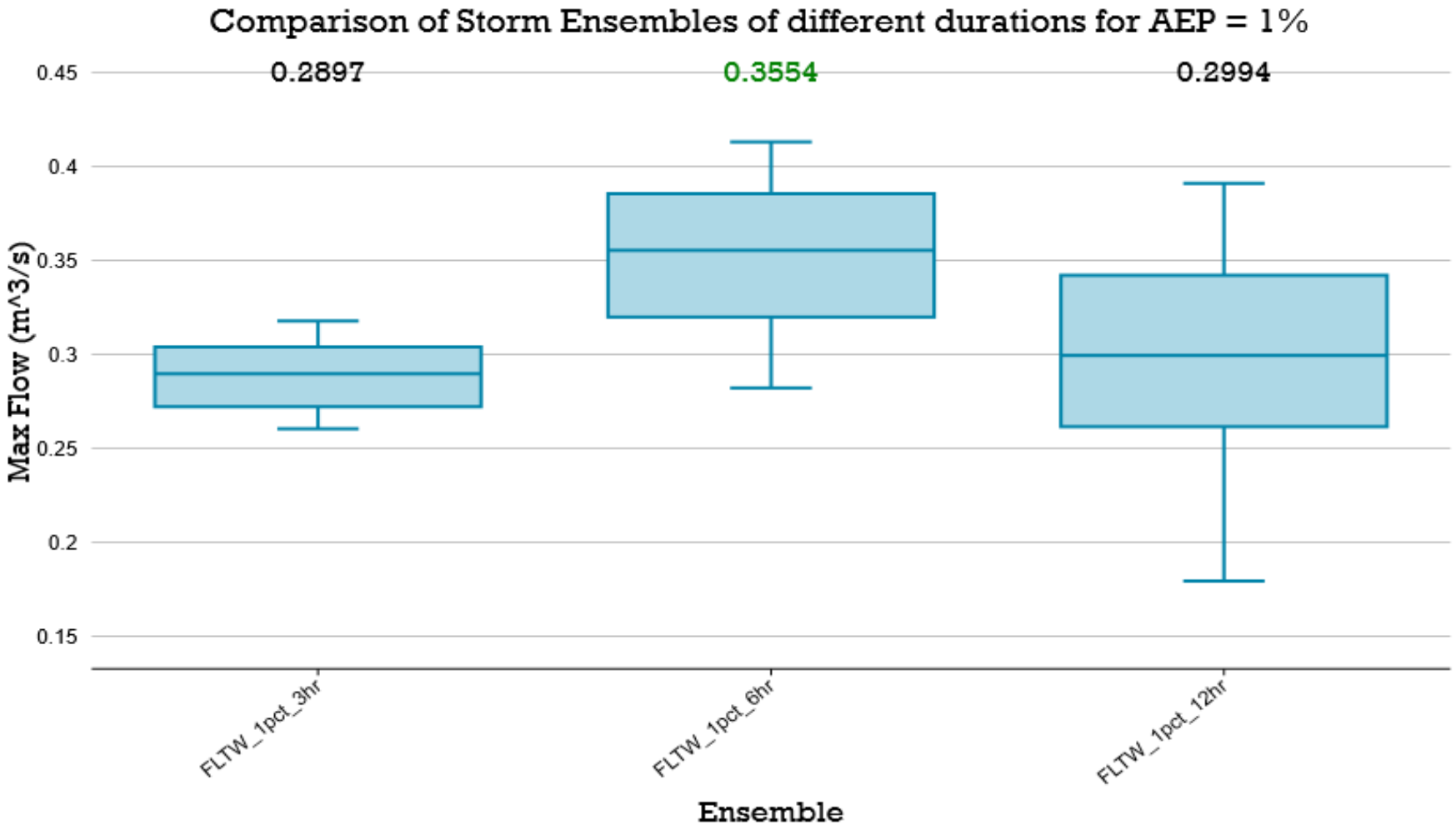
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
combined total	1%	1%	1%	2%	5%	9%	12%

Date : 30/09/2024 Job No: H23088



APPENDIX L

Post Development CURRV
Runoff Rate Calculator

CURRV

Calculator for Urban Runoff Rates & Volumes

8/11/2024

Project: Lot 3001 Eaton Dr Eaton

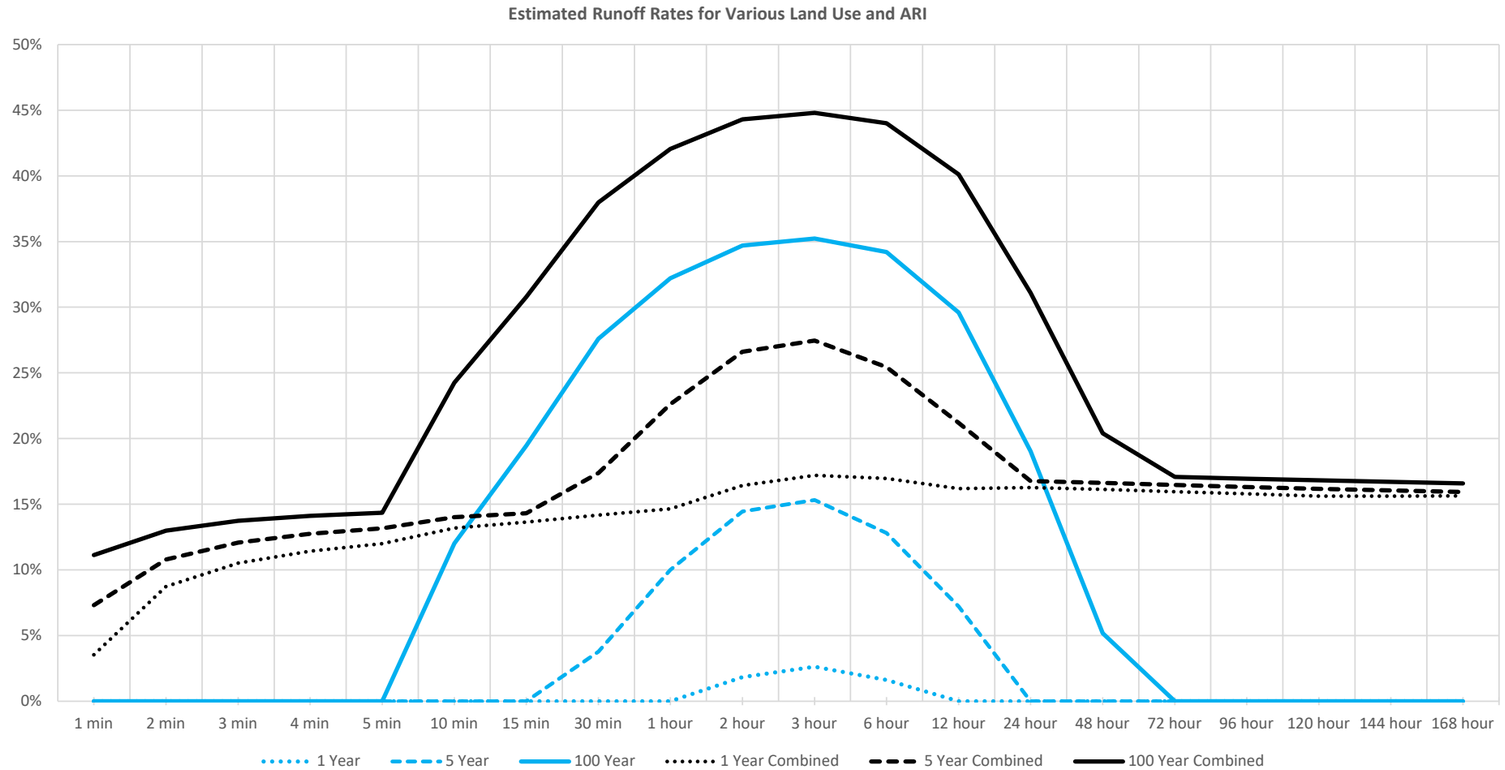
	Land Use Description	Area (ha)	Use in Calc	Imperv Initial Loss mm	Perv Initial Loss mm	Perv Continue Loss mm/hr	On Site Soak (mm)	Empty (days)	AR&R EIA/TIA System Connect Ratio	Roof %	Ext Imp %	Ext Perv %	Comment
1	Residential >500m2	8.53	Yes	1.5	20.0	4.0	15.0	0.25	60%	30	20	50	soakwells
2	Local Roads	3.09	Yes	1.5	20.0	4.0	0.0	1.00	100%	0	70	30	no soakwells assumed
3	Active POS	1.19	Yes	1.5	20.0	4.0	0.0	1.00	30%	0	5	95	assume similar EIA/TIA to rural residential
4	Grouped Housing	0.95	Yes	1.5	20.0	4.0	15.0	1.00	60%	30	20	50	soakwells
5								1.00					
6								1.00					
7								1.00					
8								1.00					
9								1.00					
10								1.00					

EIA : Effective Impervious Area, TIA : Total Impervious Area

Land Use Graph Selector: **1**

(11 - combined total)

Residential >500m2



Rainfall IFD Data

Annual Exceedence Probability

	Duration	63.2% 1.00	50% 1.44	20% 4.48	10% 10	5% 20	2% 50	1% 100
1	1 min	1.93	2.13	2.78	3.26	3.76	4.46	5.04
2	2 min	3.34	3.65	4.69	5.46	6.25	7.36	8.27
3	3 min	4.46	4.88	6.31	7.35	8.43	9.95	11.2
4	4 min	5.38	5.91	7.67	8.96	10.3	12.2	13.7
5	5 min	6.16	6.78	8.83	10.3	11.9	14.1	15.9
6	10 min	8.91	9.83	12.9	15.1	17.5	20.8	23.5
7	15 min	10.7	11.8	15.5	18.2	21	25	28.2
8	30 min	14.1	15.5	20.3	23.8	27.4	32.6	36.8
9	1 hour	18.1	19.9	25.8	30.2	34.7	41.1	46.4
10	2 hour	22.9	25.1	32.6	38.1	43.9	52	58.7
11	3 hour	26.3	28.9	37.6	44	50.6	60.1	67.8
12	6 hour	33.3	36.7	48	56.4	65.1	77.6	87.8
13	12 hour	42.3	46.6	61.2	72	83.3	99.6	113
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17	96 hour	85.2	91.7	113	128	143	166	185
18	120 hour	92.5	99.5	122	137	152	174	192
19	144 hour	99.4	107	130	146	161	183	199
20	168 hour	106	114	139	156	171	191	207

Estimated Runoff Rates

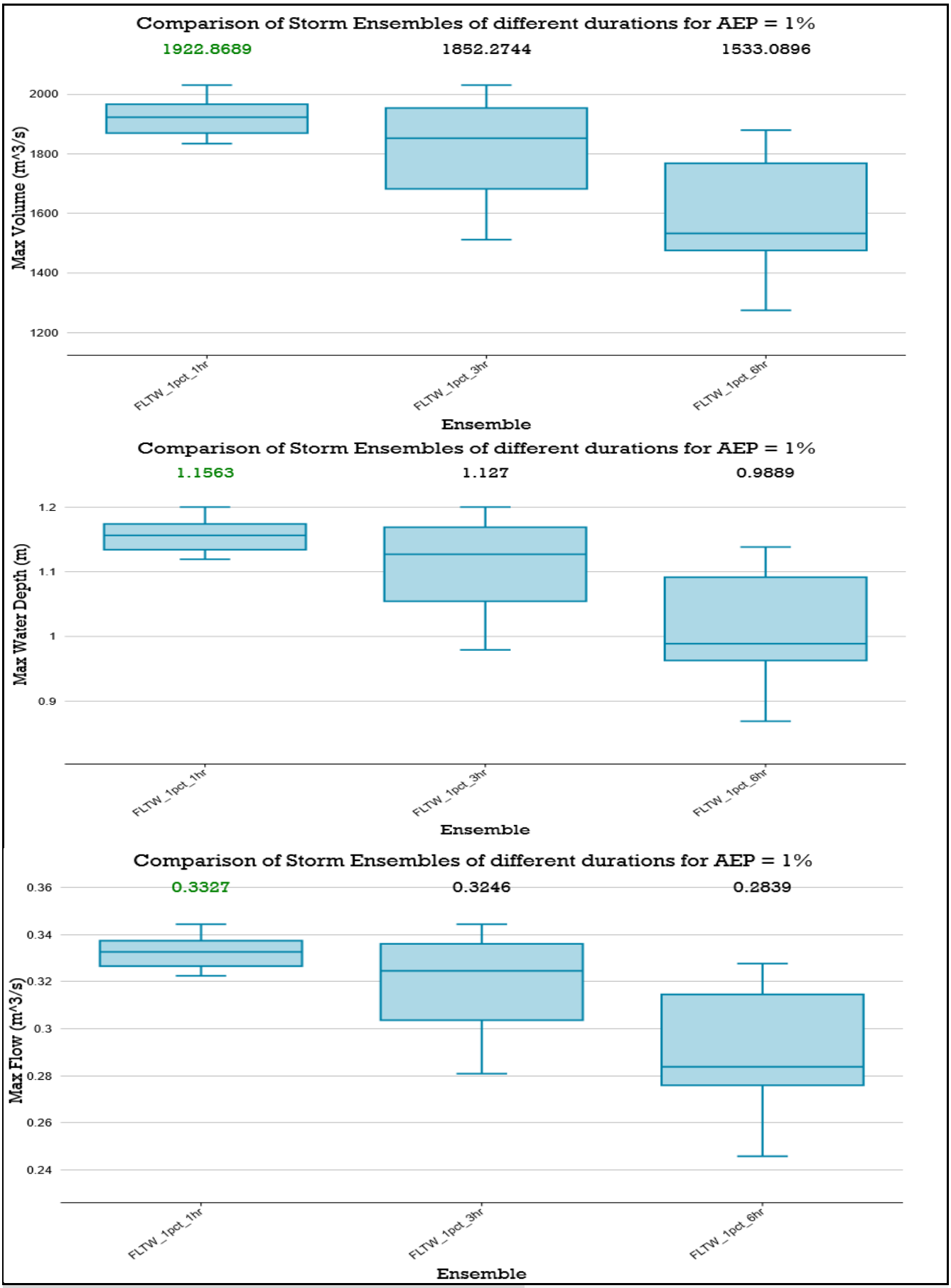
Annual Exceedence Probability

	63.2% 1.00	50% 1.44	20% 4.48	10% 10	5% 20	2% 50	1% 100
Maximum of All Events							
Residential >500m2	3%	5%	15%	22%	27%	32%	35%
Local Roads	69%	69%	72%	76%	79%	82%	84%
Active POS	1%	1%	6%	9%	12%	15%	17%
Grouped Housing	13%	15%	20%	26%	30%	35%	38%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
combined total	**17%**	19%	**27%**	**33%**	37%	42%	**45%**

Event Selector	**9**	**1 hour**					
Residential >500m2	0%	1%	10%	17%	23%	29%	32%
Local Roads	64%	65%	68%	73%	76%	80%	82%
Active POS	1%	1%	3%	7%	10%	13%	15%
Grouped Housing	2%	4%	12%	19%	24%	30%	33%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
0	0%	0%	0%	0%	0%	0%	0%
combined total	**15%**	16%	**23%**	**29%**	34%	39%	**42%**

APPENDIX M

Stormwater Modelling Outputs


Comparison of Storm Ensembles of different durations for AEP = 1%
1922.8689
1852.2744
1533.0896
Max Volume (m^3/s)
2000
1800
1600
1400
1200
FLTW_1pct_1hr
FLTW_1pct_3hr
FLTW_1pct_6hr
Ensemble
Comparison of Storm Ensembles of different durations for AEP = 1%
1.1563
1.127
0.9889
Max Water Depth (m)
1.2
1.1
1
0.9
FLTW_1pct_1hr
FLTW_1pct_3hr
FLTW_1pct_6hr
Ensemble
Comparison of Storm Ensembles of different durations for AEP = 1%
0.3327
0.3246
0.2839
Max Flow (m^3/s)
0.36
0.34
0.32
0.3
0.28
0.26
0.24
FLTW_1pct_1hr
FLTW_1pct_3hr
FLTW_1pct_6hr
Ensemble

APPENDIX N

UNDO Post Development
Nutrient Modelling

(Appendix ORD: 12.2.3A)

Government of **Western Australia**
Department of **Water and Environmental Regulation**

Project: Southbank Millbridge LWMS

Date: 8/11/2024

Version: Version 1.2.0.19289

Subregion name: Lots & POS

Landuse	Percent (%)	Area (ha)	Input load Nitrogen (kg)	Input load Phosphorus (kg)
Residential	89	9.57	903.87	228.03
Industrial, commercial & schools	0	0.00	0.00	0.00
Rural living	0	0.00	0.00	0.00
Public open space	11	1.18	52.26	1.61
Road reserve	0	0.00	0.00	0.00

Total area (ha)	Total percent (%)
10.75	78

Nitrogen input (kg/yr)	Phosphorus input (kg/yr)
1012.34	231.25

Nitrogen export (kg/yr)	Phosphorus (kg/yr)
7.07	1.55

Residential

Size (m²)	Percent (%)	Area (ha)	Input load Nitrogen (kg)	Input load Phosphorus (kg)
<400	0	0.00	0.00	0.00
400-500 m²	0	0.00	0.00	0.00
501-600 m²	4	0.38	37.77	10.10
601-730 m²	73	6.98	702.46	178.61
>730 m²	23	2.20	163.64	39.32
Multiple dwellings	0	0.00	0.00	0.00

Total area (ha)	Total percent (%)
9.566076	89

Nitrogen input (kg)	Phosphorus input (kg)
903.87	228.03

(Appendix ORD: 12.2.3A)

Public Open Space (POS)

Landuse	Percent (%)	Area (ha)
Native gardens	40	0.47
Non-native gardens	0	0.00
Not fertilised	10	0.12
Nature	0	0.00
Sport	0	0.00
Recreation	50	0.59
Golf course	0	0.00
Bowling green	0	0.00
Impervious	0	0.00
Water body	0	0.00

Total area (ha)	Total percent (%)
1.18	11

Nitrogen input (kg)	Phosphorus input (kg)
52.26	1.61

Soil and drainage information

Type of drainage	**Infiltration**	**Does it contain imported fill?**	**No**
Soil type	**Pinjarra**	**Does subregion contain onsite sewage diposal system?**	**No**
Depth to groundwater (m)	**2**		
Groundwater slope (%)	**0.01**		
Soil PRI	**19.3**		

Note: Please attach the results of soil tests to this report when submitting.

(Appendix ORD: 12.2.3A)

Subregion name: Roads

Landuse	Percent (%)	Area (ha)	Input load Nitrogen (kg)	Input load Phosphorus (kg)
Residential	0	0.00	0.00	0.00
Industrial, commercial & schools	0	0.00	0.00	0.00
Rural living	0	0.00	0.00	0.00
Public open space	0	0.00	0.00	0.00
Road reserve	100	3.03	38.20	4.68

Total area (ha)	Total percent (%)
3.03	22
Nitrogen input (kg/yr)	**Phosphorus input (kg/yr)**
54.05	5.14
Nitrogen export (kg/yr)	**Phosphorus (kg/yr)**
2.64	0.24

Road reserve

Landuse	Percent (%)	Area (ha)
Roads	40	1.21
Road reserve - impervious	30	0.91
Road reserve - native garden	5	0.15
Road reserve - non-native garden	0	0.00
Road reserve - turf	10	0.30
Road reserve - not fertilised	15	0.45

Total area (ha)	Total percent (%)
3.0316	100
Nitrogen input (kg)	**Phosphorus input (kg)**
38.20	38.20

Soil and drainage information

Type of drainage	**Piped drainage**	**Does it contain imported fill?**	**No**
Soil type	**Pinjarra**	**Does subregion contain onsite sewage diposal system?**	**No**
Depth to groundwater (m)	**2**		
Groundwater slope (%)	**0.01**		
Soil PRI	**19.3**		

Note: Please attach the results of soil tests to this report when submitting.

(Appendix ORD: 12.2.3A)

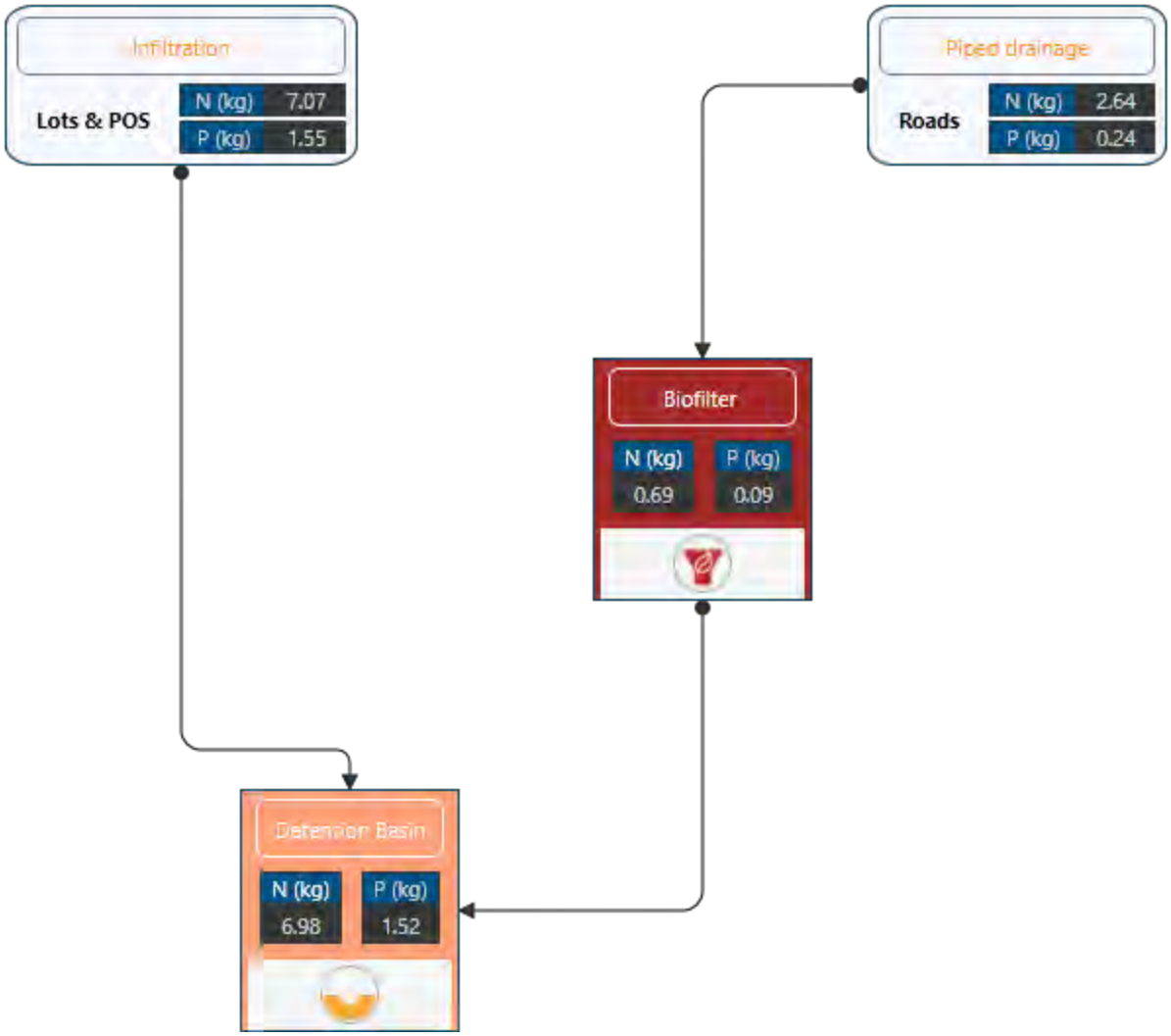
Summary: Nutrient stripping devices						
Treatment	**Name**	**Size (m²)**	**Treated area (ha)**	**Treating**	**N removed (kg/yr)**	**P removed (kg/yr)**
Biofilter	Biofilter	900.00	3.03	Heavy soils - runoff	1.96	0.15
Detention / infiltration basin	Detention Basin	2438.00	13.78	Heavy soils - runoff	0.78	0.11
Load removed					**2.73**	**0.26**
Net export					**6.98**	**1.52**

Summary: Nutrient load exports			
Region	**Area (ha)**	**P export (kg/yr)**	**N export (kg/yr)**
Lots & POS	10.75	1.55	7.07
Roads	3.03	0.24	2.64

PRE-TREATMENT LOAD (kg/yr)		LOAD REMOVED (kg/yr)		NET LOAD EXPORT (kg/yr)	
NITROGEN	PHOSPHORUS	NITROGEN	PHOSPHORUS	NITROGEN	PHOSPHORUS
9.72	**1.79**	**2.73**	**0.26**	**6.98**	**1.52**

(Appendix ORD: 12.2.3A)

Treatment diagram



APPENDIX O

Engineering Drawings

LEGEND

- DESIGN FINISHED SURFACE CONTOUR (1.0m INTERVAL)
- DESIGN FINISHED SURFACE CONTOUR (0.25m INTERVAL)
- EARTHWORKS BOUNDARY
- 1667 LOT NUMBER
- EXISTING ROAD PAVEMENT
- PROPOSED RETAINING WALL
- EXISTING DRAINAGE
- EXISTING WATER
- EXISTING SEWER
- EXISTING VACUUM MAIN
- 12.60 FINISHED EARTHWORKED LOT LEVEL

PLAN

SCALE - 1:1000

0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

REV	REVISION	DATE	APPROVED
B	EARTHWORKS LEVELS REVISED	22.10.24	JSG
A	ISSUED FOR APPROVAL	10.09.24	JSG

CLIENT

Ardross Estates (SA) Pty. Limited
A.C.N. 007 674 080 A.B.N. 87 007 674 080
A MEMBER OF THE ARDROSS GROUP OF COMPANIES

DRAWN	J. Barram
DESIGNED	J. Barram
CHECKED	J. Grierson
APPROVED	
DATE	

TITLE

ARDROSS ESTATES (SA) PTY LIMITED
MILLBRIDGE PRIVATE ESTATE SOUTHBANK
BULK EARTHWORKS PLAN

Copyright The Civil Group WA Pty Ltd

consulting civil engineers
3/224 Rokeby Road
Subiaco WA 6008
phone 9481 4255
fax 9481 3900
info@civilgroup.com.au
www.civilgroup.com.au
the civil group

ORIGINAL SHEET SIZE	A1
DO NOT SCALE	
SCALE	AS SHOWN
LEVEL DATUM :	AHD
SHEET	1 OF 1
DRAWING No	7903-SB-C101
REV	B

LEGEND

- 10.00 — DESIGN FINISHED SURFACE CONTOUR (1.0m INTERVAL)
- DESIGN FINISHED SURFACE CONTOUR (0.25m INTERVAL)
- EARTHWORKS BOUNDARY
- 1667 — LOT NUMBER
- EXISTING ROAD PAVEMENT
- D — EXISTING DRAINAGE
- W — EXISTING WATER
- S — EXISTING SEWER
- V — EXISTING VACUUM MAIN
- 12.60 — FINISHED EARTHWORKED LOT LEVEL
- PROPOSED STORMWATER DRAINAGE
- PROPOSED HEADWALL
- PROPOSED JUNCTION PIT
- PROPOSED SIDE ENTRY PIT

PLAN

SCALE - 1:1000

0 10 20 30 40 50m

SCALE 1:1000 AT ORIGINAL SIZE

REV	REVISION	DATE	APPROVED
B	BASIN LEVELS REVISED	22.10.24	JSG
A	ISSUED FOR APPROVAL	10.09.24	JSG

CLIENT

Ardross Estates (SA) Pty. Limited
A.C.N. 007 674 080 A.B.N. 87 007 674 080
A MEMBER OF THE ARDROSS GROUP OF COMPANIES

DRAWN	J. Barram
DESIGNED	J. Barram
CHECKED	J. Grierson
APPROVED	
DATE	

TITLE

ARDROSS ESTATES (SA) PTY LIMITED
MILLBRIDGE PRIVATE ESTATE SOUTHBANK
DRAINAGE LAYOUT PLAN

Copyright The Civil Group WA Pty Ltd

consulting civil engineers
3/224 Rokeby Road
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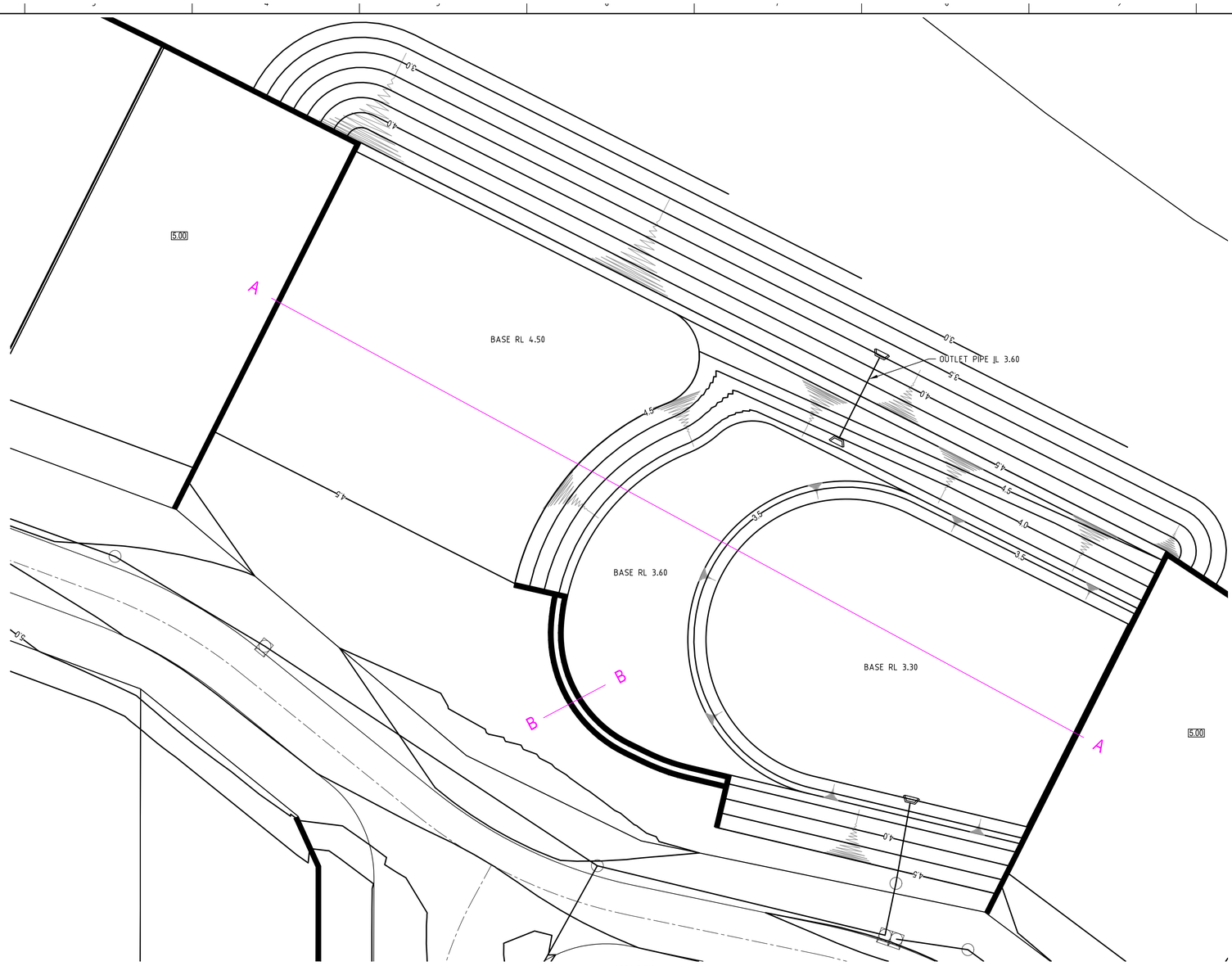
phone 9481 4255
fax 9481 3900
info@civilgroup.com.au
www.civilgroup.com.au
thecivilgroup

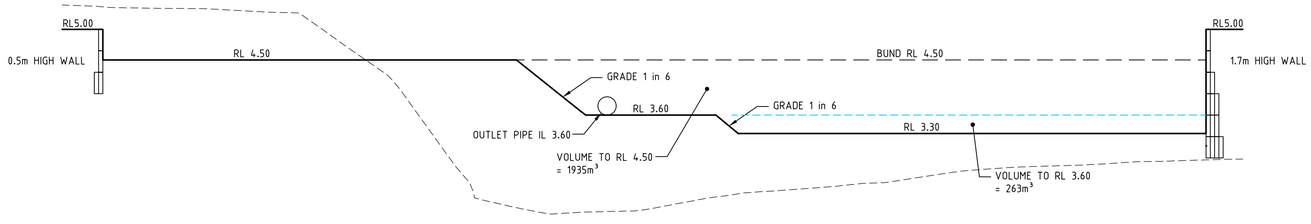
ORIGINAL SHEET SIZE	A1
DO NOT SCALE	
SCALE	AS SHOWN
LEVEL DATUM :	AHD
SHEET	1 OF 1
DRAWING No	7903-SB-SK004
REV	B

LEGEND

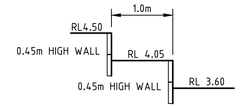
- 10.00 — DESIGN FINISHED SURFACE CONTOUR (1.0m INTERVAL)
- DESIGN FINISHED SURFACE CONTOUR (0.25m INTERVAL)
- EARTHWORKS BOUNDARY
- 1667 — LOT NUMBER
- EXISTING ROAD PAVEMENT
- EXISTING RETAINING WALL
- D — EXISTING DRAINAGE
- W — EXISTING WATER
- S — EXISTING SEWER
- V — EXISTING VACUUM MAIN
- 12.60 — FINISHED EARTHWORKED LOT LEVEL



PLAN
SCALE - 1:250



SECTION A-A
HORIZONTAL SCALE 1:250
VERTICAL SCALE 1:50



SECTION B-B
HORIZONTAL SCALE NTS
VERTICAL SCALE 1:50

0 0.5 1.0 1.5 2.0 2.5m
SCALE 1:50 AT ORIGINAL SIZE

0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

REV	REVISION	DATE	APPROVED
B	BASIN LEVELS REVISED	01.10.24	JSG
A	ISSUED FOR APPROVAL	23.05.24	JSG

CLIENT
Ardross Estates (SA) Pty. Limited
A.C.N. 007 674 080 A.B.N. 87 007 674 080
A MEMBER OF THE ARDROSS GROUP OF COMPANIES

DRAWN	J. Barram
DESIGNED	J. Barram
CHECKED	J. Grierson
APPROVED	
DATE	

TITLE
ARDROSS ESTATES (SA) PTY LIMITED
MILLBRIDGE PRIVATE ESTATE SOUTHBANK
BASIN DETAILS
DETAILS

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the civil group

ORIGINAL SHEET SIZE	A1
	DO NOT SCALE
SCALE	AS SHOWN
LEVEL DATUM :	AHD
SHEET	1 OF 1
DRAWING No	7903-SB-SK003
REV	B

abn 93 697 380 883
suite 1 387 Hay St subiaco wa 6008
PO Box 1055 subiaco wa 6904
p 08 9382 8683 f 08 9382 8712
www.hyd2o.com.au

(Appendix ORD: 12.2.3A)

Attachment H

Bushfire Management Plan

(Appendix ORD: 12.2.3A)

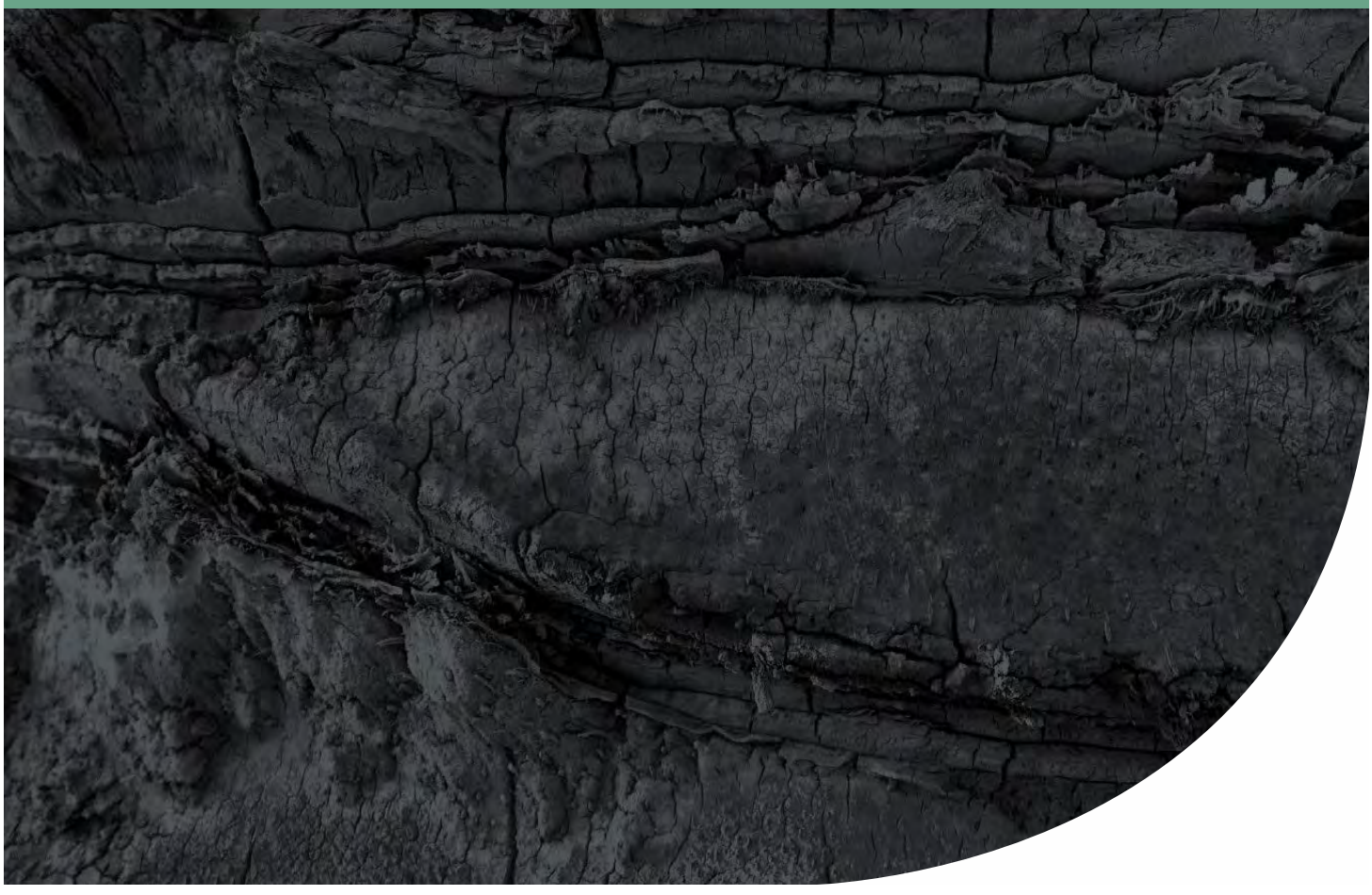
emerge ASSOCIATES
Integrated Science & Design

Bushfire Management Plan

Lot 3001 Eaton Drive (Southbank), Eaton

Project No: EP21-030(04)

Prepared for Ardross Estates (S.A.) Pty Limited
October 2024



Document Control

Doc name:	Bushfire Management Plan Lot 3001 Eaton Drive (Southbank), Eaton				
Doc no.:	**EP21-030(04)--004 CSR**				
Version	**Date**	**Author**		**Reviewer**	
1	September 2024	Claire Rogers	CSR	Kirsten Knox	KK
				Anthony Rowe	AJR
	Submitted to the client for review				
A	October 2024	Connor Porter-Wilkinson	CPW	Toni Burbidge	TB
	Minor text update following client review. Issued for approval.				

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This document has been prepared primarily to consider the layout of development and/or the appropriate building construction standards applicable to development, where relevant. The measures outlined are considered to be prudent minimum standards only based on the standards prescribed by the relevant authorities. The level of bushfire risk mitigation achieved will depend upon the actions of the landowner or occupiers of the land and is not the responsibility of the author. The relevant local government and fire authority (i.e. Department of Fire and Emergency Services or local bushfire brigade) should be approached for guidance on preparing for and responding to a bushfire.

Notwithstanding the precautions recommended in this document, it should always be remembered that bushfires burn under a wide range of conditions which can be unpredictable. An element of risk, no matter how small, will always remain. The objective of the Australian Standard AS 3959:2018 is to "prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire" (Standards Australia 2018). Building to the standards outlined in AS 3959 does not guarantee a building will survive a bushfire or that lives will not be threatened by the effects of bushfire attack.

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Executive Summary

Ardross Estates (S.A.) Pty Limited (the proponent) is proposing to lodge a subdivision application for Lot 3001 Eaton Drive (Southbank), Eaton (herein referred to as 'the site'), which falls within the approved Southbank@eaton Structure Plan area.

The area subject to subdivision is approximately 18 hectares (ha) in size and is located within the Shire of Dardanup. It is bounded by Eaton Drive to the southeast with urban development extending further southeast, the Collie River to the north and mostly cleared undeveloped land to the west. The land to the west of the site is expected to be developed in the future but is not a part of the proponents' landholdings.

The site presently comprises largely cleared rural paddocks historically utilised for stock grazing. The site is zoned 'Urban' under the Greater Bunbury Region Scheme, with a portion in the north reserved 'Regional Open Space' (associated with Kalgulup Regional Park and the Collie River). The site is zoned 'Development' under the Shire of Dardanup Town Planning Scheme No. 3 (TPS No.3), (consistent with the proposed urban subdivision and development), with the same portion under the region scheme also reserved 'Recreation' in the north.

The site is located within a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021). The identification of a site within an area declared as bushfire prone necessitates a further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and the satisfactory compliance of the proposal with the policy measures described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (the Guidelines) (DPLH & WAPC 2021).

The purpose of this Bushfire Management Plan (BMP) is to assess the bushfire hazards affecting the site (risk) and identify the 'management' strategies (risk treatments) required to ensure future development can achieve the intent of SPP 3.7 - *to preserve life and reduce the impact of bushfire on property and infrastructure.*

As part of assessing the risk, a Bushfire Attack Level (BAL) assessment involving the classification and condition of vegetation and topography within 150 m of the site (post-development) has been undertaken. Bushfire hazards identified within 150 m of the site that are assumed to remain in the long-term include:

- Forest (Class A) vegetation to the north of the site within Kalgulup Regional Park, associated with the foreshore of the Collie River.
- Forest (Class A) vegetation has been identified to the south east of the site. This vegetation falls within the adjacent Parkridge Estate Structure Plan and is indicated to be retained in a public open space. This vegetation is assumed to remain in its current condition.
- Woodland (Class B) vegetation to the north east of the site. A portion will be retained within Kalgulup Regional Park and will be a permanent hazard, while a portion will be removed for the adjacent development of the Parkridge Estate Structure Plan. However, as this area is

outside the control of the proponent and the timing of development is unknown, this area is considered a temporary hazard.

- Grassland (Class G) vegetation in the north of the site within Kalgulup Regional Park, which is similar to other areas in the structure plan will remain in its current condition and be unmanaged. Grassland vegetation has also been identified to the northeast and northwest associated with Kalgulup Regional Park. Grassland to the west within adjacent landholdings will be cleared as part of future development however as the timing is unknown, is assumed to be a temporary hazard for the purposes of this assessment.

The portion of the public open space is assumed to be managed to achieve low threat in accordance with clause 2.2.3.2 (f) of AS 3959. This includes a 9 m-wide strip to the immediate north of the lots between the lots and Kalgulup Regional Park and will likely include a dual-use footpath and well-spaced trees with mulch or similar treatment, or mown grasses. These areas will be designed and implemented by the proponent, and when handed over will become the responsibility of the Shire of Dardanup.

Areas of land identified as low threat that are external to the site are assumed to continue to be managed in accordance with existing land management practices.

Compliance assessment

The bushfire protection criteria provided in the Guidelines represent the risk treatments applicable to achieving the intent and the objectives listed in SPP 3.7. The bushfire protection criteria are divided into four subsystems (elements), plus a standalone element for tourism. Each subsystem is provided to the decision maker with an intent and solution method, either performance principle or acceptable solution (predetermined solution). Compliance with each subsystem (as a risk treatment) is required to demonstrate that the risk is within acceptance.

The BMP has identified that future development within the site (future residential buildings) will comply with the 'acceptable solution' for each of the applicable bushfire protection criteria outlined in the Guidelines.

This includes:

- **Element 1 Location:** The proposed subdivision of the site is in accordance with the zoning and structure plan for the site. All future habitable buildings will be able to achieve BAL-29 or lower as part of the proposed subdivision. Lots adjacent to the western boundary of the site are impacted by temporary hazards from the undeveloped stages of the Parkridge Estate Structure Plan and can be managed through the staging of development, or worst-case in lot rear setbacks.
- **Element 2 Siting and design:** The BAL assessment undertaken as part of the BMP indicates that it is possible for all lots to facilitate a habitable building that achieves BAL-29 or less, with future residential buildings expected to be sited predominantly within BAL-12.5 or BAL-LOW. It is noted:
  - Lots adjacent to the western boundary of the site are impacted by temporary hazards within the Parkridge Estate Structure Plan area, with the required temporary setback at the rear of lots varying between 9 m-wide and 17 m-wide.

- The grouped housing site in the southern portion of the site will require a 21 m-wide setback along the western boundary due to the assumption that the public open space within the Parkridge Estate Structure Plan is unmanaged. It is possible this area will have some management, reducing the required setback. However, the grouped housing design can include parking and/or common areas to manage the setback if required.
- A minimum 9 m-wide managed area will be required in the public open space area between lots and Kalgulup Regional Park and will likely include a dual-use footpath and well-spaced trees with mulch or similar treatment, or mown grasses.

- **Element 3 Vehicular access:** All proposed public road reserves within the site are proposed to be 15 m to 18 m wide, depending upon its hierarchy function, and will meet the minimum technical requirements for public roads compliant with the Guidelines. The proposed subdivision will provide access and egress points onto the existing Eaton Drive which provides access to the broader public road network to the north and south. Once development to the west of the site within Parkridge Estate is progressed, additional connections to the broader road network will be established. Until then, a temporary public emergency access way will be provided as a second connection from the development onto Eaton Drive and to the broader road network. Four temporary no-through roads are proposed, until Parkridge Estate to the west is developed. Only two lots are accessed from the temporary no through roads, all other lots will be accessed by through roads.
- **Element 4 Water:** The development will be provided with a permanent and reticulated water supply to support onsite firefighting requirements. The existing reticulated scheme to the south will be extended into the site and hydrants will be installed as per Water Corporation requirements

The management/mitigation measures to be implemented through the proposed subdivision and development of the site have been outlined as part of this BMP, and through these, the site can appropriately manage risk in accordance with SPP 3.7 and the Guidelines.

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Appendices

Appendix A

Subdivision Plan

Abbreviation Tables

Table A1: Abbreviations – General terms

General terms	
AS	Australian Standard
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
CCW	Conservation Category Wetland
ESA	Environmentally Sensitive Area
FDI	Fire Danger Index
UFI	Unique Feature Identifier

Table A2: Abbreviations – Organisations

Organisations	
DBCA	Department of Biodiversity, Conservation and Attractions
DFES	Department of Fire and Emergency Services
DWER	Department of Water and Environmental Regulation
DPLH	Department of Planning, Lands and Heritage
OBRM	Office of Bushfire Risk Management
WAPC	Western Australia Planning Commission

Table A3: Abbreviations – Legislation and policies

Legislation	
AS 3959	*Australian Standard 3959:2018 Construction of buildings in bushfire prone areas*
Guidelines	*Guidelines for Planning in Bushfire Prone Areas Version 1.4* (DPLH & WAPC 2021)
SPP 3.7	*State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)

Table A4: Abbreviations – Planning and building terms

Planning and building terms	
TPS	Town Planning Scheme
GBRS	Greater Bunbury Region Scheme

Table A4: Abbreviations – units of measurement

Units of measurement	
ha	Hectare
m AHD	m in relation to the Australian height datum

1 Introduction

1.1 Background

Ardross Estates (S.A.) Pty Limited (the proponent) is proposing to lodge a subdivision application for Lot 3001 Eaton Drive (Southbank), Eaton (herein referred to as 'the site'), which falls within the approved Southbank@eaton Structure Plan area.

The site is approximately 18 hectares (ha) in area and is located within the Shire of Dardanup. It is bounded by Eaton Drive to the southeast with urban development extending further southeast, the Collie River to the north and mostly cleared undeveloped land to the west as shown in **Figure 1**. The land to the west of the site is expected to be developed in the future but is not a part of the proponents' landholdings.

The site is currently partially identified as a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021) as shown in **Plate 1**. The identification of a site within an area declared as bushfire prone necessitates further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and the satisfactory compliance of the proposal with the policy measures described in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7)(WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (the Guidelines) (DPLH & WAPC 2021).

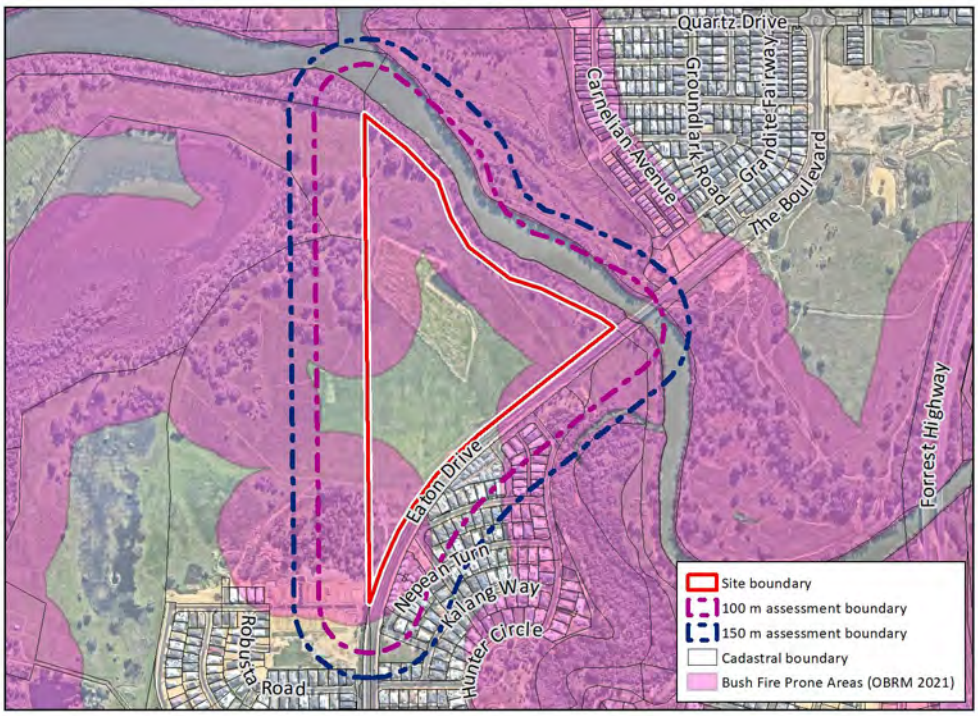


Plate 1: Areas within and surrounding the site, identified as 'bushfire prone areas' (under the state-wide Map of Bush Fire Prone Areas (OBRM 2021), is indicated in purple

The purpose of SPP 3.7 is to preserve life and reduce the impact of bushfire on property and infrastructure through effective risk-based land-use planning. Importantly, it is risk-based, requiring a

methodical approach to identify and evaluate the hazards and provide the treatments to ameliorate these hazards to an acceptable level. This has been affirmed by the Western Australian Planning Commission (WAPC):

> *SPP 3.7 does not require that there be no increase at all in the threat of bushfire to people property or infrastructure. Rather, as is seen in clause 2 of SPP 3.7, the intention of the policy is to 'implement effective, risk-based land use planning and development to preserve life and **reduce the impact of bushfire on property and infrastructure'**. (emphasis added)* [1]

1.2 Aim of this report

The purpose of this BMP is to assess bushfire hazards both within the site, and nearby, and demonstrate that the threat posed by any identified hazards can be appropriately mitigated and managed. This BMP has been prepared in accordance with SPP 3.7 (WAPC 2015), the Guidelines (DPLH & WAPC 2021) and AS 3959 (Standards Australia 2018). The document includes:

- An assessment of the existing classified vegetation in the vicinity of the site (within 150 m) and consideration of bushfire hazards that will exist in the post development scenario (**Section 3**).
- Commentary on how the future development can achieve compliance with the bushfire protection criteria outlined within the Guidelines, including an indication of BAL ratings likely to be applicable to future buildings (**Section 5**).
- An outline of the roles and responsibilities associated with implementing this BMP (see **Section 6**).

1.3 Statutory policy and framework

The following key legislation, policies and guidelines are relevant to the preparation of a bushfire management plan:

- *Bush Fires Act 1954*
- *Fire and Emergency Services Act 1998*
- *Planning and Development Act 2005* and associated regulations
- *Building Act 2011* and associated regulations
- *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)
- *Guidelines for Planning in Bushfire Prone Areas Version 1.4* (DPLH & WAPC 2021)
- *Australian Standard AS 3959 – 2018 Construction of buildings in bushfire prone areas* (Standards Australia 2018)

[1] Harmanis Holdings No. 2 Pty Ltd and Western Australian Planning Commission [2019] WASAT 43 (Harmanis).

1.4 Description of the proposed development

The site is proposed to be subdivided into 120 residential lots, as shown in the subdivision concept plan provided in **Appendix A**, and will include public roads and a small area of managed public open space. Additionally, a portion of the site will be amalgamated as Regional Open Space (for the Kalgulup Regional Park) in accordance with the approved Southbank@eaton Structure Plan.

The proposed subdivision and development within the site is also consistent with the 'Urban' zoning and 'Regional Open Space' reservation of the site under the Greater Bunbury Region Scheme (GBRS) and the 'Development' zoning under the Shire of Dardanup Town Planning Scheme No. 3 (TPS No.3), as shown in **Plate 2** below.

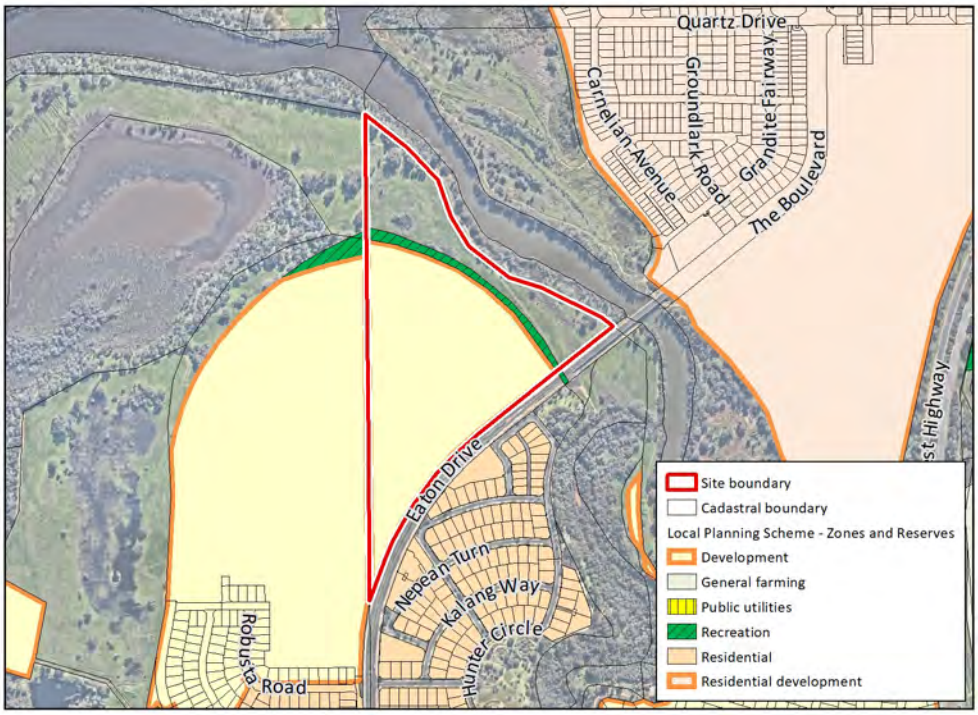


Plate 2: Local Planning Scheme Zoning, in and surrounding the site.

1.5 Description of land characteristics

Based on the observed site conditions and a review of publicly available historical aerial photography, the site was cleared of native vegetation almost in its entirety prior to 1970, with a few remnant scattered trees remaining, predominantly along the Collie River (and will be retained as part of the reserve for the Kalgulup Regional Park). The site was utilised for rural/ agricultural purposes, likely stock grazing (Landgate 2024).

Elevation across the site is gently rising from 2 m Australian Height Datum (m AHD) in the northeastern portion to approximately 10 m AHD in the southwestern portion of the site, as shown in **Figure 1**. The embankment adjacent to the Collie Rive in the north varies from a short steep slope in discrete locations to largely flat and has generally been averaged as downslope 0-5 degrees.

2 Environmental Considerations

In accordance with the *Bushfire Management Plan – BAL Contour* template prepared by the Department of Planning, Lands and Heritage (DPLH) (2018), this BMP has considered whether there are any environmental values that may require specific consideration through either protection, retention, or revegetation. To support this, a review of publicly available databases has been undertaken and supporting structure plan documentation, with particular reference to the Shared Location Information Platform (SLIP) databases. A summary of the search results has been provided in **Table 1**.

The key environmental considerations that have relevance for the management of bushfire risk include the Collie River, which is also a conservation category wetland, to the north of the site. Remnant vegetation within the site is largely associated with remnant trees along the river.

Table 1: Summary of potential environmental considerations that may be associated with the site.

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Conservation category wetlands and buffer (Geomorphic wetlands, Swan Coastal Plain (DBCA-019))	Potentially	A review of the *Geomorphic Wetlands of the Swan Coastal Plain* dataset indicates the site is mapped as a multiple use wetland. No specific protection of multiple use wetlands are required. A conservation category wetland associated with the Collie River is located immediately to the north and is a floodplain type wetland, while to the southeast of the site a palusplain (seasonally inundated) type wetland is present.
RAMSAR wetlands (DBCA-010)	No	No RAMSAR wetlands are identified as occurring within the site or in close proximity.
Threatened and priority flora (DBCA-036)	No	The site was largely cleared of native vegetation prior to 1970 with scattered remnant trees present, mostly in proximity to the Collie River, or in the southern portion of the site. Based on historic aerial imagery, the site has been used for grazing and hay production. The site does not support any threatened or priority flora.
Threatened and priority fauna (DBCA-037)	No	As outlined, the site is cleared of native vegetation except for scattered native trees and some reeds/rushes, the majority of which are within the area proposed to be included within Kalgulup Regional Park (and the Collie River) in the north of the site, with a couple of scattered trees in the south. The vegetation adjacent to the Collie River is proposed to be retained and no management for bushfire purposes is required. ..
Threatened ecological communities (DBCA-038)	No	It is unlikely that any of the vegetation within the site would be a threatened ecological community (TEC) or priority ecological community (PEC), with only scattered native trees (the majority of which are *Eucalyptus rudis*) over paddock grasses largely present.
Bush Forever areas (DPLH-019)	No	Not applicable. No Bush Forever sites are identified within the site or nearby.

Table 1: Summary of potential environmental considerations that may be associated with the site.

Key environmental feature (information in brackets refers to mapping data source)	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Clearing regulations – Environmentally sensitive areas (DWER-046)	Yes	A small portion of the site is situated within an environmentally sensitive area (ESA), associated with the conservation category wetland associated with the Collie River to the northeast of the site. This area is within the portion of the site that will form part of the Kalgulup Regional Park. ESAs are only a relevant consideration where native vegetation is present and/or exemptions pursuant to Schedule 6 of the *Environmental Protection Act 1986* do not apply.
Swan Bioplan Regionally Significant Natural Areas 2010 (DWER-070)	No	Not applicable. No Regionally Significant Natural Areas are identified within the site or nearby.

2.1 Native vegetation – modification and clearing

As outlined above, the majority of the site has been previously cleared and now comprises predominantly cleared paddocks with scattered trees. The location of the majority of the trees within the site are within the area designated to be public open space (Kalgulup Regional Park) as seen in the subdivision plan (**Appendix A**).

Where clearing of native vegetation is undertaken in accordance with subdivision approval under the *Planning and Development Act 2005* or to implement the requirements of other legislation, such as Section 33 of the *Bush Fires Act 1954* (as examples), it is exempt from requiring a clearing permit under Schedule 6 of the *Environmental Protection Act 1986* (EP Act). Where outside an environmentally sensitive area, exemptions pursuant to the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 can also apply, such as those provided by a building licence or planning approval. A clearing permit would not be required where vegetation is not considered 'native vegetation' pursuant to Division 2 Section 51A of the EP Act, including trees that have been sown, planted or propagated.

2.2 Revegetation and landscape plans

There is no revegetation proposed as a part of this development. Areas that fall as a part of Kalgulup Regional Park will have vegetation retained within them and are assumed to be retained in their current condition and no ongoing management is required for bushfire purposes.

Areas within the public open space/drainage basin will be landscaped and managed to low threat.

Landscape treatments that are proposed in future public open space, residential gardens and verge planting within road reserves, are assumed to be able to achieve low threat in accordance with Section 2.2.3.2 of AS 3959, based on standard treatments for urban areas and the requirements of the Shire of Dardanup. This is likely to include:

- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built-up dead material (such as fallen branches, leaf litter etc.)
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application of ground/surface covers such as mulch or non-flammable materials as required.
- Regular mowing/slashing of grass to less than 50 mm in height.

Nature strips (verges) within public road reserves are excluded pursuant to clause 2.2.3.2(f) of AS 3959, where they are listed as a type of use/vegetation that can be excluded. Specific management is not required.

3 Bushfire Assessment Results

Bushfire risk for the site has been appropriately considered with regard to the potential impact upon the site using AS 3959 and the Guidelines.

The objective of AS 3959 is to reduce the risk of ignition and loss of a building to bushfire. It provides a consistent method for determining a radiant heat level (radiant heat flux) as a primary consideration of bushfire attack. AS 3959 measures the Bushfire Attack Level (BAL) as the radiant heat level (kW/m^2) over a distance of 100 m. AS 3959 also prescribes deemed-to-satisfy construction responses that can resist the determined radiant heat level at a given distance from the fire. It is based on six Bushfire Attack Level (BAL) ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

A BAL contour plan has been prepared in accordance with Appendix Three of the Guidelines and Method 1 of AS 3959 to determine the BAL ratings likely to be applicable to future buildings. This has been based on the vegetation classifications and the effective slope under the vegetation (post-development scenario).

3.1 Assessment inputs

The bushfire attack level (BAL) assessment was undertaken in accordance with Method 1 of AS 3959. Vegetation classifications and effective slope have been detailed in **Table 2** and **Figure 2** and a site assessment was completed on 13 September 2024.

3.1.1 Inputs and assumptions

The BAL assessment is based on the following inputs and assumptions:

- **Designated Fire Danger Index (FDI)**: 80
- **Flame temperature**: 1090 K
- **Effective slope beneath classified vegetation**: flat/upslope and downslope 0-5° (see **Figure 2**)
- The remnant vegetation adjacent to the Collie River to the north of the site is to be retained as part of the Kalgulup Regional Park. This area contains forest, woodland and grassland vegetation which is expected to remain a hazard post development of the site (see **Figure 2**). No management for bushfire purposes is assumed within the regional park.
- Classified vegetation identified to the west of the site includes woodland, grassland and forest vegetation. This vegetation falls within the adjacent Parkridge Estate Structure Plan, which is proposed for urban development, however, the timing is unknown, and it is therefore assumed to be a temporary bushfire hazard (and present) for the purposes of this assessment. Public open space areas within Parkridge Estate Structure Plan area are assumed to be a bushfire hazard but could be subject to management as part of future development.
- Existing grassland vegetation identified within the site will be removed or managed in accordance with Section 2.2.3.2 of AS 3959 and will be maintained as detailed in **Section 2.2**.
- Areas identified as low threat that are external to the site are assumed to continue to be managed in accordance with existing land management practices in the long term (unless stated otherwise).

- Areas of grassland can include up to 10% foliage cover from shrubs and trees, as per AS 3959.

3.1.2 Vegetation classification

All vegetation within 150 m of the site was classified in accordance with Section 2.2.3 of AS 3959. The assignment of vegetation classifications is based on an assessment of vegetation structure, including consideration of the various fuel layers of different vegetation types, as outlined in **Plate 3.** Each distinguishable vegetation plot is described in **Table 2** and shown in **Figure 2**.

Not all vegetation is classified as a bushfire risk. Vegetation and ground surfaces that are exempt from classification as a potential hazard are identified as a low threat under Section 2.2.3.2 of AS 3959. Low threat vegetation includes the following:

a. *Vegetation of any type that is more than 100 m from the site.*
b. *Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified.*
c. *Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified.*
d. *Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.*
e. *Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings, and rocky outcrops.*
f. *Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves, and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and wind breaks.*

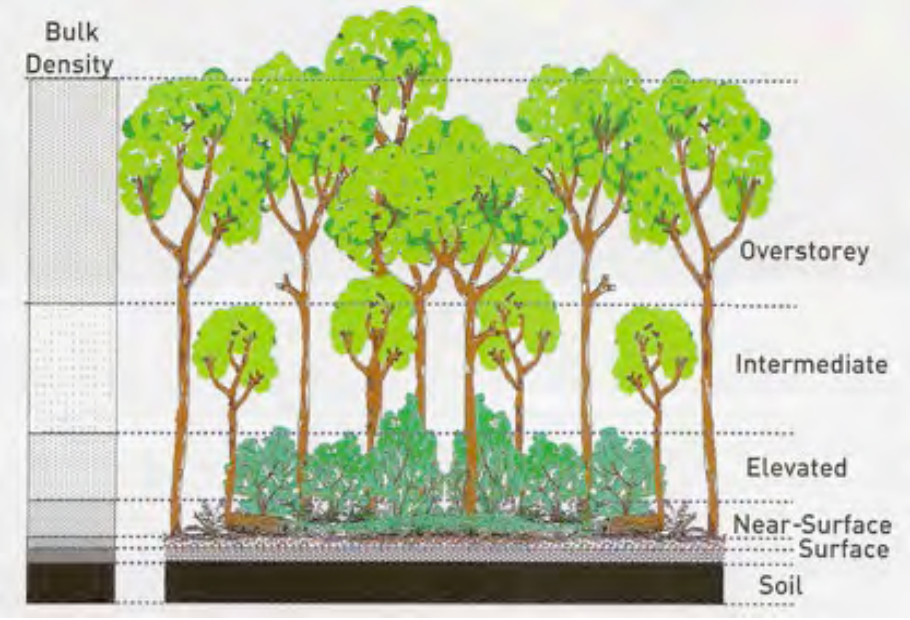


Plate 3: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)*

Photo ID:	1	**Plot:**	1
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Downslope 0-5)			
Description / Justification for Classification			
Forest (Class A) vegetation has been identified to the east of the site comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover with a dense understory of shrubs and grasses. This vegetation, being located within Castlereagh Park and part of Kalgulup Regional Park, will remain post-development of the site.			
Photo ID:	2	**Plot:**	1
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Downslope 0-5)			
Description / Justification for Classification			
Forest (Class A) vegetation has been identified to the east of the site comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover with a dense understory of shrubs and grasses. This vegetation, being located within Castlereagh Park and part of Kalgulup Regional Park, will remain post-development of the site.			
Photo ID:	3	**Plot:**	2
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Downslope 0-5°)			
Description / Justification for Classification			
A variable width strip of forest (Class A) vegetation has been identified to the east of the site comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over an understorey of shrubs and grasses. This vegetation is associated with the foreshore on both sides of the Collie River and is to be retained within the Kalgulup Regional Park. Forest vegetation is seen in the foreground and across the river in the background.			

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)*

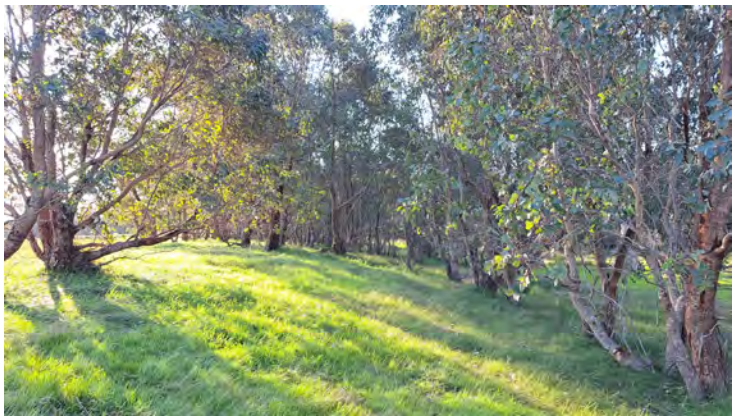
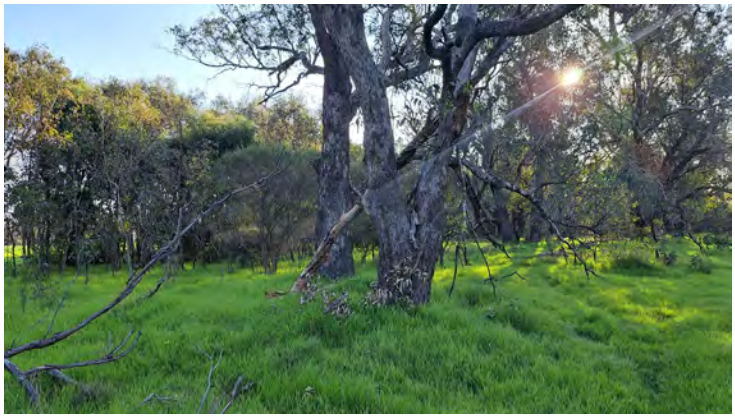
Photo ID:	4	**Plot:**	2
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Downslope 0-5º)			
Description / Justification for Classification			
Forest (Class A) vegetation has been identified to the north and north-east of the site comprising a dense stand of trees of variable maturity with greater than 30% foliage cover over an understorey of shrubs and grasses. This vegetation is associated with the foreshore of the Collie River and is to be retained within the Kalgulup Regional Park.			
Photo ID:	5	**Plot:**	2
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Downslope 0-5º)			
Description / Justification for Classification			
Forest (Class A) vegetation has been identified to the north-west of the site comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over an understorey of shrubs and grasses. This vegetation is associated with the foreshore of the Collie River and is to be retained within the Kalgulup Regional Park as part of Parkridge Estate development.			
Photo ID:	6	**Plot:**	3
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Flat/upslope)			
Description / Justification for Classification			
Forest (Class A) vegetation has been identified to the south west of the site comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over an understorey of mostly grasses and occasional shrubs. This vegetation is outside the proponent's landholding and falls within the adjacent Parkridge Estate Structure Plan. This vegetation is indicated to be retained within public open space and while it might be managed, is assumed to be retained in its current condition.			

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)*

Photo ID:	7	**Plot:**	3
Vegetation classification or exclusion clause (and effective slope)			
Class A - Forest (Flat/upslope)			
Description / Justification for Classification			
Forest (Class A) vegetation has been identified to the south west of the site comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over an understorey of mostly grasses and occasional shrubs. This vegetation is outside the proponent's landholding and falls within the adjacent Parkridge Estate Structure Plan. This vegetation is indicated to be retained in public open space and while it might be managed, it is assumed to be retained in its current condition.			
Photo ID:	8	**Plot:**	4
Vegetation classification or exclusion clause (and effective slope)			
Class B - Woodland (Downslope 0-5)			
Description / Justification for Classification			
Woodland (Class B) vegetation has been identified to the west of the site. This vegetation comprises trees with a height of between 6 – 15 m, with less than 30% foliage cover over a predominantly grassy understorey. The Parkridge Estate structure plan indicates portions of this patch of vegetation may be retained, while it might be managed, it is assumed to be retained in its current condition.			
Photo ID:	9	**Plot:**	4
Vegetation classification or exclusion clause (and effective slope)			
Class B - Woodland (Downslope 0-5)			
Description / Justification for Classification			
Woodland (Class B) vegetation has been identified to the west of the site. This vegetation comprises trees with a height of between 6 – 15 m, with less than 30% foliage cover over a predominantly grassy understorey. The Parkridge Estate structure plan indicates portions of this patch will be removed for future development, however, the development timing is unknown so this vegetation is wholly classified as a hazard.			

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)*

Photo ID:	10	**Plot:**	5
Vegetation classification or exclusion clause (and effective slope)			
Class G - Grassland (Downslope 0-5)			
Description / Justification for Classification			
Grassland vegetation has been identified to the east of the site, within existing portions of Kalgulup Regional Park. This vegetation may be subject to some management (given growth appeared to be only the last 12 months), however for the purposes of this assessment is assumed to be unmanaged and a hazard.			
Photo ID:	11	**Plot:**	5
Vegetation classification or exclusion clause (and effective slope)			
Class G - Grassland (Downslope 0-5)			
Description / Justification for Classification			
Grassland vegetation has been identified in the east of the site. This vegetation is in an area that will form part of Kalgulup Regional Park and is assumed to be unmanaged in the future.			
Photo ID:	12	**Plot:**	5
Vegetation classification or exclusion clause (and effective slope)			
Class G - Grassland (Dowsnlope 0-5)			
Description / Justification for Classification			
Grassland vegetation has been identified to the north of the site. This vegetation is in an area that will form part of Kalgulup Regional Park and is assumed to be unmanaged in the future.			

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)*

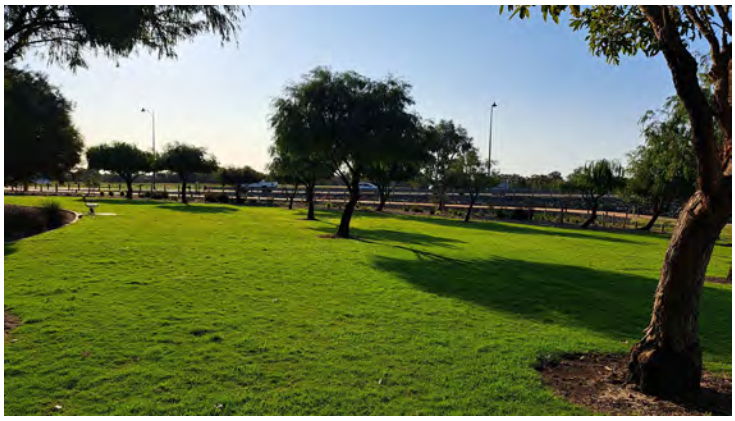
Photo ID:	13	**Plot:**	5
Vegetation classification or exclusion clause (and effective slope)			
Class G - Grassland (Downslope 0-5)			
Description / Justification for Classification			
Grassland vegetation has been identified to the north-west of the site. This vegetation is in an area that will form part of Kalgulup Regional Park and is assumed to be unmanaged in the future			
Photo ID:	14	**Plot:**	6
Vegetation classification or exclusion clause (and effective slope)			
Class G - Grassland (Downslope 0-5)			
Description / Justification for Classification			
Grassland vegetation has been identified to the west of the site. This vegetation is in an area proposed for future urban development. As the timings of this development are uncertain for the purpose of this assessment, it is conservatively assumed to remain.			
Photo ID:	15	**Plot:**	6
Vegetation classification or exclusion clause (and effective slope)			
Class G - Grassland (Downslope 0-5)			
Description / Justification for Classification			
Grassland vegetation has been identified to the west of the site. This vegetation is in an area proposed for future urban development. As the timings of this development are uncertain for the purpose of this assessment, it is conservatively assumed to remain.			

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)*

Photo ID:	16	**Plot:**	7
Vegetation classification or exclusion clause (and effective slope)			
Exclusion clause 2.2.3.2(e) (Non-vegetated)			
Description / Justification for Classification			
Non-vegetated areas within Eaton Road and existing areas of residential developments have been identified. This includes Eaton Drive passing through the centre of the picture. The site is shown on the left of the photo. These areas contain no or, if present, low threat road verges and are assumed to remain in their current condition. This area has been excluded in accordance with clause 2.2.3.2(e) of AS 3959.			
Photo ID:	17	**Plot:**	8
Vegetation classification or exclusion clause (and effective slope)			
Exclusion clause 2.2.3.2(f) (Managed)			
Description / Justification for Classification			
Managed vegetation has been identified to the east of the site associated with an active recreation portion of Castlereagh Park and a managed road verge/cycle path along Eaton Drive. There is evidence of irrigation, mowing of grass and removal of built up fuel loads. This vegetation is under the management of the Shire of Dardanup. This management is assumed to continue and the area has been excluded in accordance with clause 2.2.3.2(f) of AS 3959.			
Photo ID:	18	**Plot:**	7
Vegetation classification or exclusion clause (and effective slope)			
Exclusion clause 2.2.3.2(e) (Non-vegetated)			
Description / Justification for Classification			
Existing residential areas to the east of the site have been excluded as non-vegetated areas in accordance with clause 2.2.3.2(e) of AS 3959. Vegetated areas may be present as gardens or verges, but would be excluded as managed (clause 2.2.3.2(f)), and for ease of reference have been shown as clause (e).			

*Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)*

Photo ID:	19	Plot:	8
Vegetation classification or exclusion clause (and effective slope)			
Exclusion clause 2.2.3.2(f) (Managed)			
Description / Justification for Classification			
Managed vegetation has been identified to the east of the site within an active recreation portion of Castlereagh Park. There is evidence of irrigation, mowing of grass and removal of built up fuel loads. This vegetation is under the management of the Shire of Dardanup. This management is assumed to continue and the area has been excluded in accordance with clause 2.2.3.2(f) of AS 3959.			



3.2 Assessment outputs

The vegetation classifications determined in **Section 3.1** are summarised in **Table 3** and shown in **Figure 2** and incorporate the known changes to vegetation post-development within the site and the determined effective slope.

Table 3: AS 3959 vegetation classification and effective slope applicable to the site

Plot	Applied vegetation classification	Effective slope
1	Class A – Forest (associated with Castlereagh Park)	Downslope 0-5°
2	Class A – Forest (associated with existing and future remanant vegetation to be retained within Kalgulup Regional Park)	Downslope 0-5°
3	Class A – Forest (associated with a public open space in Parkridge Estate that may be managed)	Flat/upslope
4	Class B – Woodland (temporary hazard that will be mostly removed or managed)	Downslope 0-5°
5	Class G – Grassland (existing and future unmanaged grass areas within Kalgulup Regional Park)	Downslope 0-5°
6	Class G – Grassland (temporary hazard that will be removed)	Downslope 0-5°
7	Exclusion 2.2.3.2(e) (existing and proposed roads and residential lots)	Not applicable
8	Exclusion 2.2.3.2(f) (existing and proposed managed public open space)	Not applicable

The resultant BAL ratings for the site are shown in **Figure 3**. The BAL ratings are based on the minimum distances outlined in Table 2.5 of AS 3959 for the applicable vegetation classifications and effective slope. The relevant setback distances for the BAL ratings from AS 3959 have been summarised for ease of reference in **Table 4**.

The BAL assessment shows that all future habitable buildings should be able to achieve BAL-29 or less, with the majority of lots likely to be BAL-12.5 or BAL-LOW. A minimum 9 m-wide managed area

will be required in the public open space area between lots and Kalgulup Regional Park to achieve BAL-29 (it is approximately 13 m-wide) and will likely include a dual-use footpath and well-spaced trees with mulch or similar treatment, or mown grasses.

The main exception to lots achieving BAL-29 or less is the lots adjacent to the western boundary of the site, which are impacted by temporary hazards from the undeveloped stages of the Parkridge Estate Structure plan area. In particular:

- Temporary setbacks at the rear of lots, varying between 9 m-wide and 17 m-wide, depending upon if grassland or woodland vegetation is present.
- The grouped housing site in the southern portion of the site will require a 21 m-wide setback along the western boundary due to the assumption that the public open space within the Parkridge Estate Structure Plan is unmanaged. It is possible this area will have some management, reducing the required setback. However, the grouped housing design can include parking and/or common areas to manage the setback if required.

Development can be staged along the western boundary to minimise the impact of temporary hazards on BAL ratings.

Table 4: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment.

Plot number (see Figure 2)	Vegetation classification (see Figure 2)	Effective slope (see Figure 2)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating
Plot 3	Forest (Class A)	Flat/upslope	< 16 m	BAL-FZ
			16 - < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 1 and Plot 2	Forest (Class A)	Downslope >0 to 5 degrees	< 20 m	BAL-FZ
			20 - < 27 m	BAL-40
			27 - < 37 m	BAL-29
			37 - < 50 m	BAL-19
			50 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 4	Woodland (Class B)	Downslope >0 to 5 degrees	< 13 m	BAL-FZ
			13 - < 17 m	BAL-40
			17 - < 25 m	BAL-29
			25 - < 35 m	BAL-19
			35 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 5 and Plot 6	Grassland (Class G)	Downslope >0 to 5 degrees	< 7 m	BAL-FZ
			7 - < 9 m	BAL-40
			9 - < 14 m	BAL-29
			14 - < 20 m	BAL-19
			20 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW

4 Identification of Bushfire Hazard Issues

From a bushfire hazard management perspective, based on the requirements of SPP 3.7 and the Guidelines, the key issues that are likely to require management and/or consideration as part of future development within the site, particularly the construction of new habitable buildings, include:

- Provision of appropriate separation distance from bushfire hazards to ensure a BAL rating of BAL-29 or less can be achieved at habitable buildings (built form). This will include ensuring that site landscaping is designed, implemented, and managed to achieve low threat for the areas identified to reduce the impact of bushfire and risk of fires starting onsite and to provide separation to identified and/or assumed hazards. Temporary hazards to the west can be managed through staging of development and/or if required in-lot setbacks.
- The grouped housing lot in the southern portion of the site will require a minimum separation distance of 21 m to be accommodated in the area abutting the forest vegetation assumed to remain as part of Parkridge Estate Structure Plan to the west, to ensure habitable buildings achieve BAL-29 or less.
- Ensuring that the site has access to a road network that supports egress to multiple destinations and that temporary no through roads due to staging of development are less than 200 m long with suitable turn-around areas or are provided with temporary emergency access ways or are subject to exceptions. Due to the unknown timing of Parkridge Estate, a temporary emergency access way will be required to provide a second access to/from the site, in this regard two possible options have been identified on **Figure 4**. Collie River to the north constrains the ability to provide other connections.
- Ensuring that the provision of water for firefighting is sufficient and accessible by firefighting services, to be accommodated by the reticulated water network.

4.1 Permanent hazards

The land surrounding the site comprises a mix of uses, including existing residential areas to the east and south, the Collie River and Kalgulup Regional Park to the north and undeveloped land zoned for residential development (Parkridge Estate Structure Plan area) to the west.

Classified forest, woodland and grassland vegetation is expected to remain to the north, west and east of the site within the Kalgulup Regional Park and no ongoing management is assumed of these areas. Classified forest vegetation to the south of the site, associated with future public open space areas, may be managed to low threat, but this is unknown at this stage and is assumed to be a hazard.

4.2 Temporary hazards

Once vegetation is removed or modified within the site (unless identified as being unmodified) and subdivision commences, the entire site (or within 50 m of proposed stages) will need to be managed by the proponent to achieve low threat at all times until the lots are sold and common areas (roads and managed public open space areas) are handed to the Shire of Dardanup. This will include regular slashing/mowing of grass/weedy regrowth.

Grassland and woodland vegetation (indicted as temporary hazards within **Figure 2**) that has been identified outside of the site to the west will be removed when future subdivision stages progress in accordance with the Parkridge Estate Structure Plan. As this area is not under the proponents' control and timing is unknown, this area is assumed to be unmanaged and a bushfire hazard.

4.3 Vulnerable or high risk land use

The definition of a vulnerable land use is where occupants are less able to respond in an emergency. The types of land uses considered vulnerable include "*facilities that, due to the building design or use, or the number of people accommodated, are likely to present evacuation challenges*." This generally includes (but is not limited to) schools, hospitals, aged care facilities and similar. The identification of a land use as a vulnerable use is at the discretion of the decision maker.

A high-risk land use is one where practices that occur within the site may lead to a potential ignition and spread of a fire from the site or could prolong the duration or intensity of a bushfire should a fire arrive from outside the site.

No vulnerable or high-risk land uses are identified as part of the subdivision plan.

5 Assessment Against the Bushfire Protection Criteria

The bushfire protection criteria provided in the Guidelines represent the risk treatments applicable to achieving the intent and the objectives listed in SPP 3.7. The bushfire protection criteria are divided into four subsystems (elements), plus a standalone element for tourism. Each subsystem is provided with an intent and solution method, either performance principle or acceptable solution (one predetermined solution). Compliance with each subsystem (as a risk treatment) is required to demonstrate to the decision maker that the risk is within acceptance.

The bushfire protection criteria identified in the Guidelines and addressed as part of this BMP are:

- Element 1: Location
- Element 2: Siting and design of the development
- Element 3: Vehicular access
- Element 4: Water supply.

The proposed subdivision is compared with bushfire protection criteria in **Table 5**. The assessment demonstrates that the development can achieve the objectives of SPP 3.7 and addresses these through acceptable solutions detailed in the Guidelines.

Table 5: Assessment against the bushfire protection criteria from the Guidelines

Bushfire protection criteria	Proposed bushfire management strategies
Element 1: Location	
A1.1 Development location	The proposed subdivision is in accordance with the approved structure plan. The BAL assessment, discussed in **Section 3.2**, has indicated that all proposed lots will be able to provide an area where future habitable buildings can achieve BAL-29 or less, although lots along the west may prefer to be managed by the staging of development to minimise the impact of temporary bushfire hazards on building construction caused by land not under the proponent's' control. The proposal complies with A1.1.
Element 2: Siting and design	
A2.1 Asset Protection Zone (APZ)	Some lots are required to be managed to a low threat condition with a minimum Asset Protection Zone (APZ) equivalent to enable BAL-29 to be achieved at the habitable building. APZs are typically contained within a lot but can also include areas external to a lot that achieve low threat in accordance with Section 2.2.3.2 of AS 3959 where the APZ cannot be contained within the lot boundaries (such as managed road reserves or public open space). As outlined, the classified forest, woodland and grassland vegetation within Kalgulup Regional Park will be retained in the north of the site, as well as to the east and west. A low threat managed portion of public open space (dual use footpath, tree planting and mulch or mown grass or similar) will be provided between lots and Kalgulup Regional Park. Lots will be able to achieve Bal-29 or less. The forest vegetation to the south west of the site will be retained in an area of public open space as part of the adjacent Parkridge Estate development. This will result in BAL-FZ and BAL -40 existing into the grouped housing site, with a 21 m-wide APZ required in the lot. If the public open space is not managed, the grouped housing lot could accommodate the APZ through the strategic positioning of carparks or other non-habitable infrastructure. This is shown in **Figure 4**. Continued below.

Table 5: Assessment against the bushfire protection criteria from the Guidelines (continued)

Bushfire protection criteria	Proposed bushfire management strategies
Element 32: Siting and design (continued)	
A2.1 Asset Protection Zone (APZ)	Temporary hazards to the west of the site, associated with future development stages within the Parkridge Estate Structure Plan area will result in BAL-FZ and BAL-40 extending into the lots, but is as a result of staged development and can be managed through either in-lot setbacks or staging of development. The proposal complies with A2.1.
Element 3: Vehicular access	
A3.1 Public roads	All proposed public roads within the site can and will meet the minimum technical requirements for public roads compliant with the local government standards and with Table 6 column 1 of the Guidelines (**Plate 4** below). The proposed road reserves are between 15 m to 18 m wide (refer to **Appendix A** and **Figure 4**). The proposal complies with A3.1.
A3.2a Multiple access routes	The proposed subdivision provides a loop road network that connects to Eaton Drive, which provides for egress to Treendale town centre to the north and Eaton town centre (and Bunbury) to the south. Connections to the west are also provided for, in line with the approved Parkridge Estate and Southbank@eaton structure plans, however until development commences to the west, development within the site will only have a single road connection to Eaton Drive. A temporary emergency access way is proposed to facilitate a second access point until development to the west is completed, in this regard two possible options have been identified in **Figure 4** and discussed below. The proposal can comply with A3.2a and is in accordance with the approved structure plans for the area.
A3.2b Emergency access way	None are required permanently. Due to the staging of development within Parkridge Estate to the west of the site, it is possible that only a single access to Eaton Drive will be available. If required, a temporary emergency access way can be provided from the site to Eaton Drive until development to the west has progressed and road connections are available. Possible locations are indicated in **Figure 4** and the specific location will be confirmed in consultation with the Shire of Dardanup. As part of the staging within the proposal, if no-through roads greater than 200 m are proposed, temporary emergency access ways may be required internally to ensure access to two different destinations. Emergency access ways should comply with the requirements of Table 6 column 1 of the Guidelines (**Plate 4** below) or as agreed with the local government. The proposal complies with A3.2b

Table 5: Assessment against the bushfire protection criteria from the Guidelines (continued)

Bushfire protection criteria	Proposed bushfire management strategies
A3.3 Through-roads	None will be present permanently, however due to the staging of development within Parkridge Estate to the west of the site, it is possible that four temporary no-through roads could be present (and cannot be avoided as the structure plans are required to connect). These are shown on **Figure 4** and are generally less than 35 m long. Only two lots are accessed from the temporary no through roads, all other lots will be accessed by through roads. Where temporary no-through roads are required as part of staged subdivision within the site, these must be developed in accordance with A3.3 including having a maximum length of 200 m (unless exceptions under the Guidelines are applicable), a compliant turn-around head and meeting the minimum technical standards for a public road as detailed in Table 6, Column 1 of the Guidelines (see **Plate 4**), or as agreed with the local government. The proposal complies with A3.3.
A3.4a Perimeter roads	A perimeter public road interface is not provided between all lots and permanent classified vegetation external to the site. Lots in the north of the site will have a managed public open space interface between classified grassland vegetation (which is closest to the lots), and is likely to include a dual use footpath or similar (as per existing access within other areas of Kalgulup Regional Park). Under the Guidelines, a perimeter road is not required where lots interface within grassland vegetation. Vegetation to the west is a temporary hazard and as the road connections are in accordance with the approved structure plans, no perimeter access is proposed. Lots on the west will connect to other residential areas. The proposal complies with A3.4a.
Element 3: Vehicular access	
A3.4b Fire service access route	No fire service access route is proposed or required to achieve compliance as the permanent bushfire hazard to the north is classified grassland vegetation. Therefore A3.4b is not applicable. A multiple purpose dual use footpath could be installed in consultation with the Shire of Dardanup if required.
A3.5 Battle-axe access legs	No battle-axe legs are proposed and therefore A3.5 is not applicable.
A3.6 Private driveway longer than 70 metres	Not applicable to subdivision.
Element 4: Water	
A4.1 Reticulated areas	Not applicable to subdivision and development applications.
A4.2 Provision of water for firefighting purposes	The site is located in a reticulated water supply area. Hydrants exist to the south of the site within 100 m of the site, as shown in **Figure 4.** The current network will be extended as part of subdivision within the site and additional hydrants will be supplied as part of subdivision in accordance with the water authority requirements.

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way[1]	3 Fire service access route[1]	4 Battle-axe and private driveways[2]
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road[3]		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

Notes:

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Plate 4: Excerpt of Table 6 from The Guidelines

5.1 Additional management strategies

5.1.1 Future approval considerations

The BAL assessment in this BMP assesses the potential bushfire risk posed to future habitable buildings within the site, based on the assumptions outlined in **Section 3**.

Following the creation of lot titles, a building licence will be required before the habitable building construction can commence.

Future Class 1, 2, 3 and 10a buildings in designated bushfire prone areas and within an area subject to a BAL rating of BAL-12.5 or higher, will need to satisfy construction standards in accordance with the National Construction Code (NCC) (e.g., AS 3959 or the National Association for Steel-framed Housing).

5.1.2 Vegetation management

5.1.2.1 Within the site

Public open space areas and road reserves

It is assumed that as part of the development of the site, all areas of vegetation associated with the Collie River and the area designated as Regional Open Space (Kalgulup Regional Park) will be retained in its current state. No ongoing management is assumed in this area.

Landscaping undertaken within the identified areas of managed public open space (shown in **Figure 4**) will be designed, landscaped and maintained to a low threat standard in accordance with Section 2.2.3.2 of AS 3959 (in particular Clause 2.2.3.2 (f)). Ongoing management will be aligned with typical urban requirements and will likely include:

- Irrigation of grass and garden beds (where present/required).
- Regular removal of weeds and built-up dead material (such as fallen branches, leaf litter etc.).
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application of ground/surface covers such as mulch or non-flammable materials as required.
- Regular mowing/slashing of grass and/or turf to less than 100 mm in height.

This will be the responsibility of the proponent initially, and following handover will be the responsibility of the Shire of Dardanup. The managed area of public open space was discussed with the Shire of Dardanup as part of initial discussions on the subdivision.

Future lots

All lots, once created, are required to be managed by the relevant landowner to a minimal fuel condition and achieve low threat as per Section 2.2.3.2 of AS 3959, in accordance with this BMP and the Shire o Dardanup Fire Hazard Reduction Notice (as published).

Management of temporary bushfire hazards

In order to minimise the impacts of temporary grassland hazards on proposed lots within the site, as part of staging of subdivision, it is recommended that the proponent manage a 50 m-wide area surrounding each stage to a low threat standard, where within their landholdings and outside the area proposed for Regional Open Space (Kalgulup Regional Park).

This 50 m wide area should be maintained to achieve low threat in accordance with Section 2.2.3.2 of AS 3959 and will be the responsibility of the proponent until urban development progresses and/or other formal arrangements are made and agreed to with the City. Ongoing management is likely to include:

- Maintain areas to have a fine fuel loading of 2 tonnes per hectare or less.
- Where present, regular mowing/slashing of grass/weeds to less than 100 mm in height (throughout the year, particularly during the bushfire season).

5.1.2.2 Surrounding the site

Private landholdings and public open space areas

Where indicated as a low threat in **Figure 2**, the areas surrounding the site will be managed by the applicable landowners/land managers in accordance with the Shire of Dardanup Fire Hazard Reduction Notice (as published) and/or in accordance with existing maintenance regimes.

Where indicated as classified vegetation in **Figure 2**, areas have been assumed to remain a bushfire hazard in the long-term. Temporary hazards have been identified in association with future development in accordance with the Parkridge Estate Structure Plan, and while these areas will be removed in the future, as the timing is unknown it is assumed to be unmanaged.

5.1.3 Public education and preparedness

Community bushfire safety is a shared responsibility between individuals, the community, government, and fire agencies. DFES has an extensive Community Bushfire Education Program including a range of publications, a website, and Bushfire Ready Groups. The DFES website (https://www.dfes.wa.gov.au/bushfire/prepare/) provides a range of materials to help the community prepare for and survive the bushfire season.

The Shire of Dardanup provides bushfire advice to residents available from their website https://www.dardanup.wa.gov.au/our-services/fire-emergency/firebreaks-and-fire-control.aspx Professional, qualified consultants also offer bushfire safety advice and relevant services to residents and businesses in high-risk areas in addition that that provided in this BMP.

In the case of a bushfire in the area, advice would be provided to occupants by DFES, and/or the Shire of Dardanup on any specific recommendations with regard to responding to the bushfire, including evacuation if required.

6 Responsibilities for Implementation and Management of Bushfire Measures

Table 6 outlines the future responsibilities of the proponent/developer to be undertaken to support the clearance of titles. These items will be certified by a bushfire consultant.

Table 6: Responsibilities for the implementation of this BMP prior to issue of titles

Developer/landowner	
No.	Implementation action
1	Unless identified for retention (e.g. classified vegetation associated with the Kalgulup Regional Park), ensure all classified vegetation in the site (or stage of development) is either removed or modified to achieve low threat in accordance with Section 2.2.3.2 of AS 3959.
2	Install the public roads to the standards outlined in Appendix Four of the Guidelines or as agreed with the Shire of Dardanup. Public road reserves should be designed and maintained to achieve low threat in accordance with Section 2.2.3.2 of AS 3959.
3	Reticulated water supply and hydrants are to be installed as per standard water authority requirements unless otherwise agreed.
4	As part of staged development, two access routes must be provided at all times other than: • Temporary no-through roads that meet the requirements of the Guidelines with suitable turning heads or other exceptions apply. • If emergency access ways are required temporarily to provide two access routes during adjacent development, they must be provided in accordance with the minimum technical requirements of Appendix Four and Table 6 of the Guidelines.

Table 7 outlines the future responsibilities of the proponent and future landowners associated with implementing this BMP with reference to ongoing bushfire risk mitigation measures for existing land uses (through compliance with the Shire's fire hazard reduction notice) or future mitigation measures to be accommodated as part of the development process but not necessarily for title clearances. These responsibilities will need to be considered as part of the subsequent development and implementation process.

Table 7: Responsibilities for the implementation of this BMP during development (building construction) and ongoing

Developer/landowner	
No.	Implementation action
1	Management of the site to achieve low threat is specified in **Table 6**, Item 1 to support the creation of titles. As part of the development works, the areas of public open space and road reserves identified as low threat within the site (see **Figure 4**) should be designed, and implemented to achieve a low threat standard in accordance with Section 2.2.3.2 of AS 3959. Where present, mature trees can be retained. Where relevant, ongoing management is likely to include (but is not limited to): • Irrigation of grass and garden beds (where required) • Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.) • Low pruning of trees. • Application of ground/surface covers such as mulch or non-flammable materials as required. • Regular mowing/slashing of grass to less than 100 mm in height Maintenance will be the responsibility of the proponent until handover to the Shire of Dardanup, and the Shire thereafter.
Property (lot) owners	
No.	Implementation action
1	Maintain the lot to a low threat standard in accordance with Section 2.2.3.2(e) and (f) of AS 3959 and the principles of the Asset Protection Zones Standard of Schedule 1 of the Guidelines and/or the Shire Dardanup fire hazard reduction notice requirements, whichever is the higher standard.

7 Applicant Declaration

7.1 Accreditation

This assessment has been prepared by Emerge Associates who have been providing bushfire risk management advice for more than 10 years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry. Emerge Associates have a number of team members who have undertaken Bushfire Planning and Design (BPAD) Level 1 and Level 2 training and are Fire Protection Association of Australia (FPAA) accredited practitioners.

Anthony Rowe is a FPAA Level 3 BPAD accredited practitioner (BPAD No. 36690) in accordance with clause 6.12 of the Guidelines.

7.2 Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Reviewer signature:

Name: Anthony Rowe

Company: Emerge Associates/Envision Bushfire Planning

Date: 25 September 2024

BPAD Accreditation: BPAD No. 36690

8 References

8.1 General references

The references listed below have been considered as part of preparing this document.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*, Western Australia, <https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-swan-coastal-plain>.

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Gould, J., McCaw, W., Cheney, N., Ellis, P. and Matthews, S. 2007, *Field Guide: Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Forest*, CSIRO and Department of Environment and Conservation, Perth, Western Australia.

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Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*, Western Australia, <https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-swan-coastal-plain>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022b, *Threatened Ecological Communities (DBCA-038)*, Perth, Western Australia <https://catalogue.data.wa.gov.au/dataset/threatened-ecological-communities>.

Department of Planning, Lands and Heritage (DPLH) 2019, *Bush Forever Areas 2000 (DPLH-019)*, <https://catalogue.data.wa.gov.au/org/department-of-planning-lands-and-heritage>.

Department of Planning, Lands and Heritage, and Western Australian Planning Commission, (DPLH & WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas Version 1.4*, Perth, Western Australia.

Department of Water and Environmental Regulation (DWER) 2021, *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*, <https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046>.

Gould, J., McCaw, W., Cheney, N., Ellis, P. and Matthews, S. 2007, *Field Guide: Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Forest*, CSIRO and Department of Environment and Conservation, Perth, Western Australia.

Landgate 2024, *Map Viewer Plus* <https://map-viewer-plus.app.landgate.wa.gov.au/>.

Office of Bushfire Risk Management (OBRM) 2021, *Map of Bush Fire Prone Areas*, Landgate, https://maps.slip.wa.gov.au/landgate/bushfireprone/.

Standards Australia 2018, *AS 3959:2018 Construction of buildings in bushfire-prone areas*, Sydney.

Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Perth.

8.2 Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 8.1**, with access date information provided in **Table R-1**.

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
(Landgate 2024)	09.09.2024	https://map-viewer-plus.app.landgate.wa.gov.au/index.html
(OBRM 2021)	09.09.2024	Bush Fire Prone Areas
(DBCA 2022a)	09.09.2024	Geomorphic Wetlands, Swan Coastal Plain
(DBCA 2017)	09.09.2024	Ramsar Sites
(DBCA 2022b)	09.09.2024	Threatened ecological communities
(DWER 2021)	09.09.2024	Environmentally Sensitive Areas
(DPLH 2019)	09.09.2024	Bush Forever areas

Figures

Figure 1: Site Location and Topographic Contours

Figure 2: AS 3959 Vegetation Classification and Effective Slope

Figure 3: Bushfire Attack Level Contour Plan

Figure 4: Spatial Representation of Bushfire Management Strategies

(Appendix ORD: 12.2.3A)

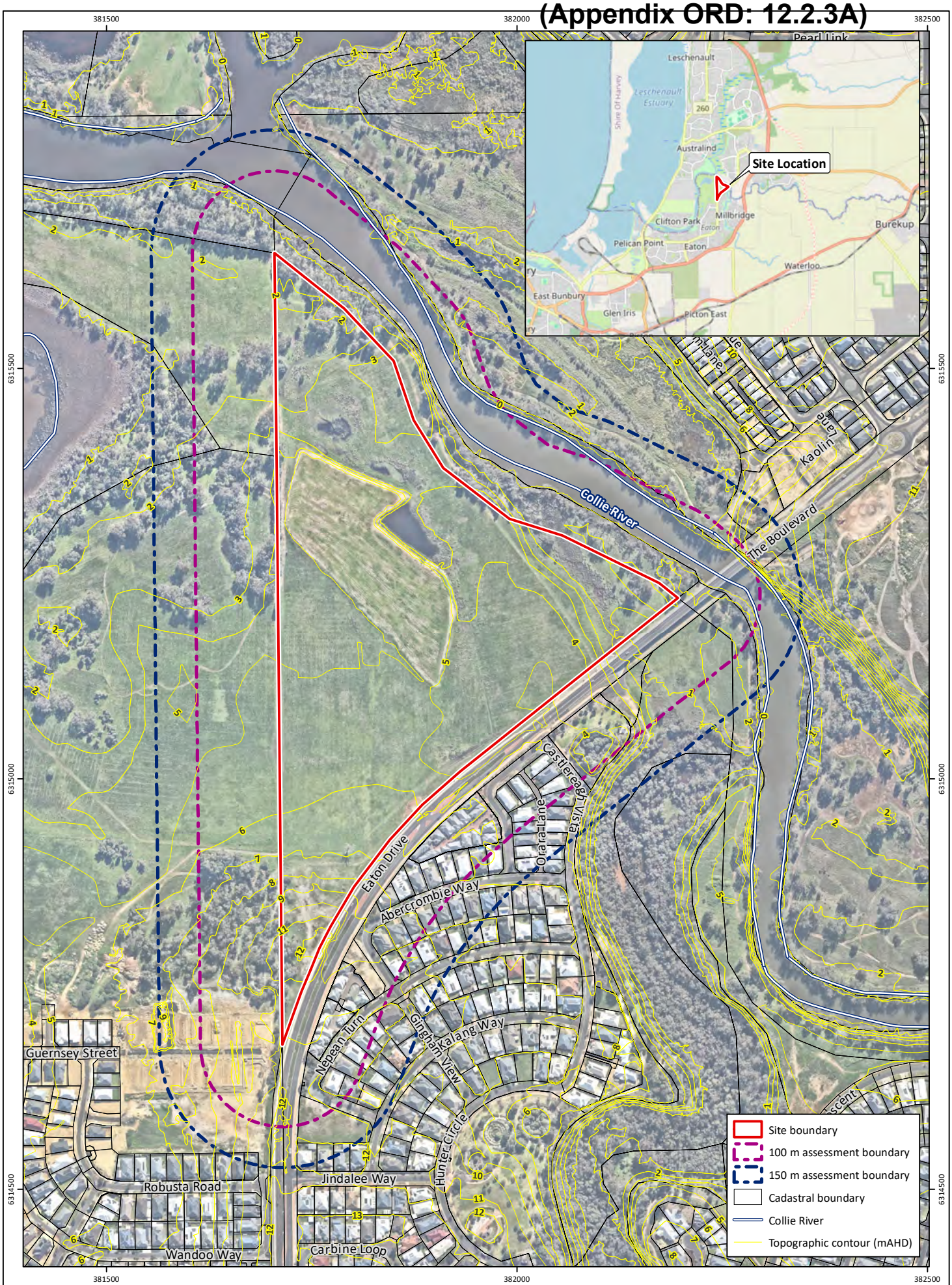

Figure 1: **Site Location and Topographic Contours**

Project: Bushfire Management Plan
Lot 3001 Eaton Drive (Southwark), Eaton
Client: Ardross Estates (S.A.) Pty Limited

Plan Number: EP21-030(04)--F08
Drawn: GAR
Date: 19/09/2024
Checked: CSR
Approved: KK
Date: 24/09/2024

N

0 50 100 150
Metres
Scale: 1:6,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used.
©Landgate (2024). Nearmap Imagery date: 20/06/2024

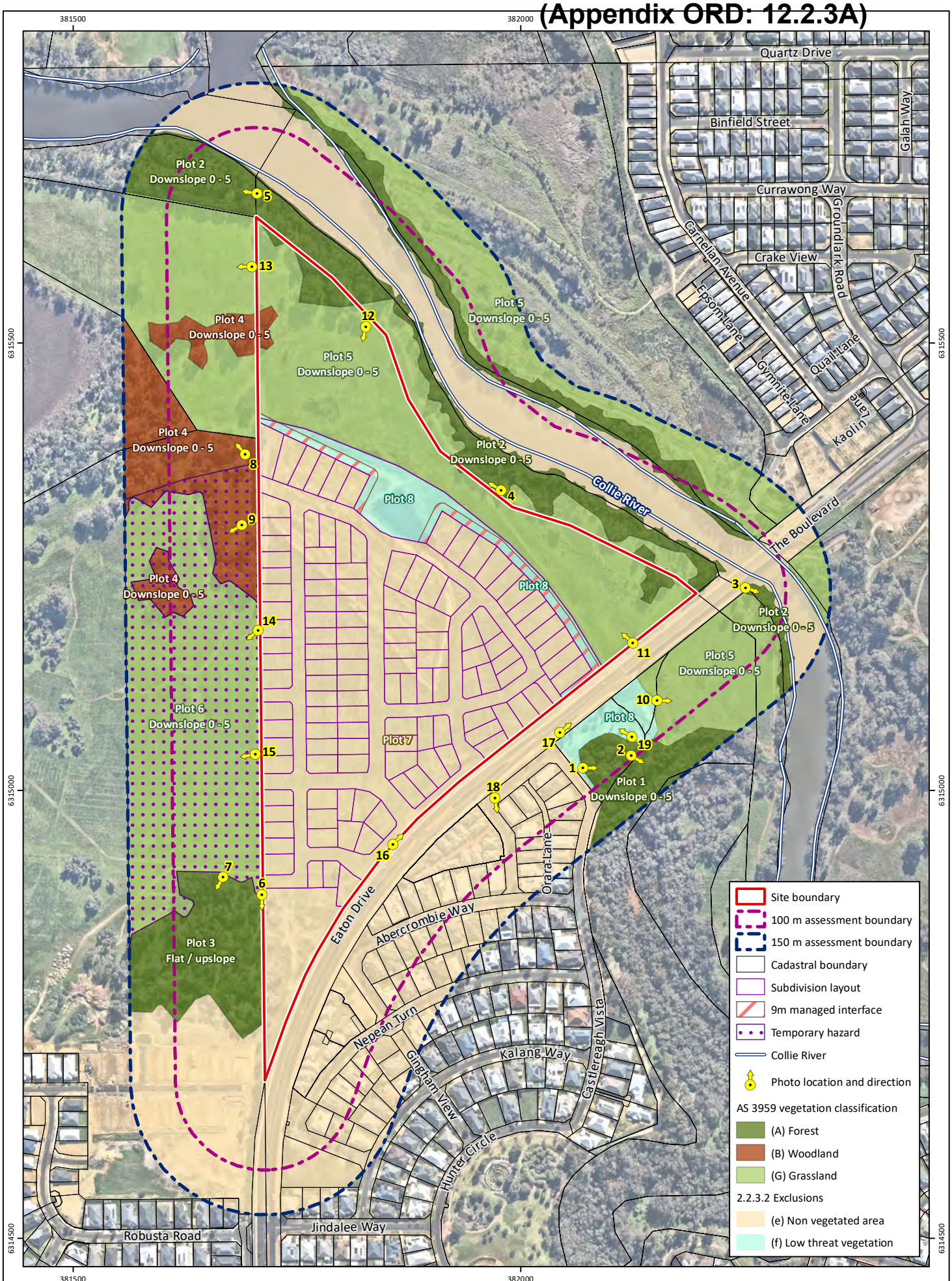

Figure 2: AS 3959 Vegetation Classification and Effective Slope

Project: Bushfire Management Plan
Lot 3001 Eaton Drive (Southwark), Eaton

Client: Ardross Estates (S.A.) Pty Limited

Plan Number: EP21-030(04)--F09

Drawn:	GAR
Date:	19/09/2024
Checked:	CSR
Approved:	KK
Date:	24/09/2024

N

0 50 100 150
Metres

Scale: 1:5,500@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used.
©Landgate (2024). Nearmap Imagery date: 20/06/2024

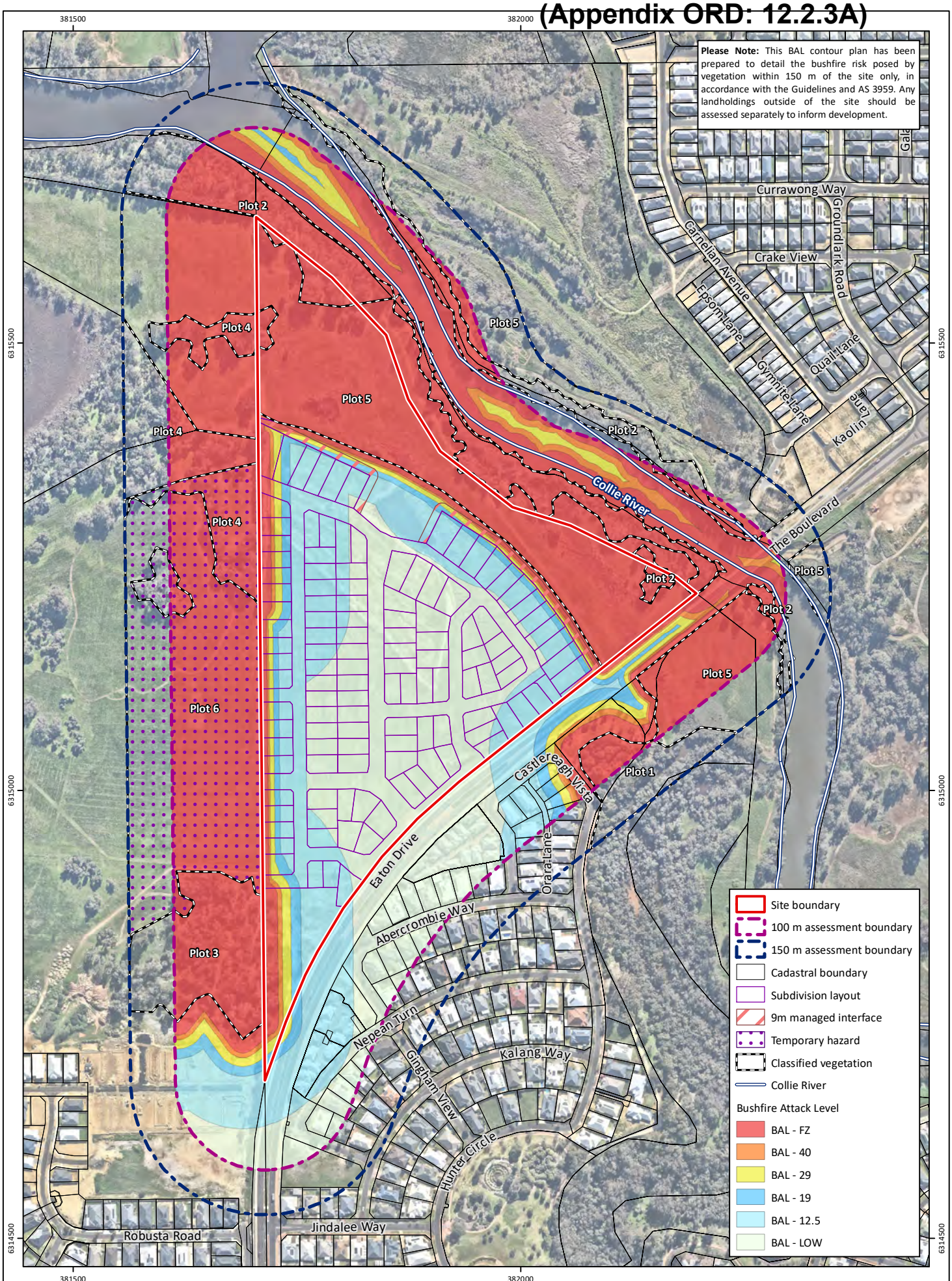

Figure 3: **Bushfire Attack Level Contour Plan**

Project: Bushfire Management Plan
Lot 3001 Eaton Drive (Southwark), Eaton
Client: Ardross Estates (S.A.) Pty Limited

Plan Number: EP21-030(04)--F10
Drawn: GAR
Date: 19/09/2024
Checked: CSR
Approved: KK
Date: 24/09/2024

N

0 50 100 150
Metres
Scale: 1:5,500@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

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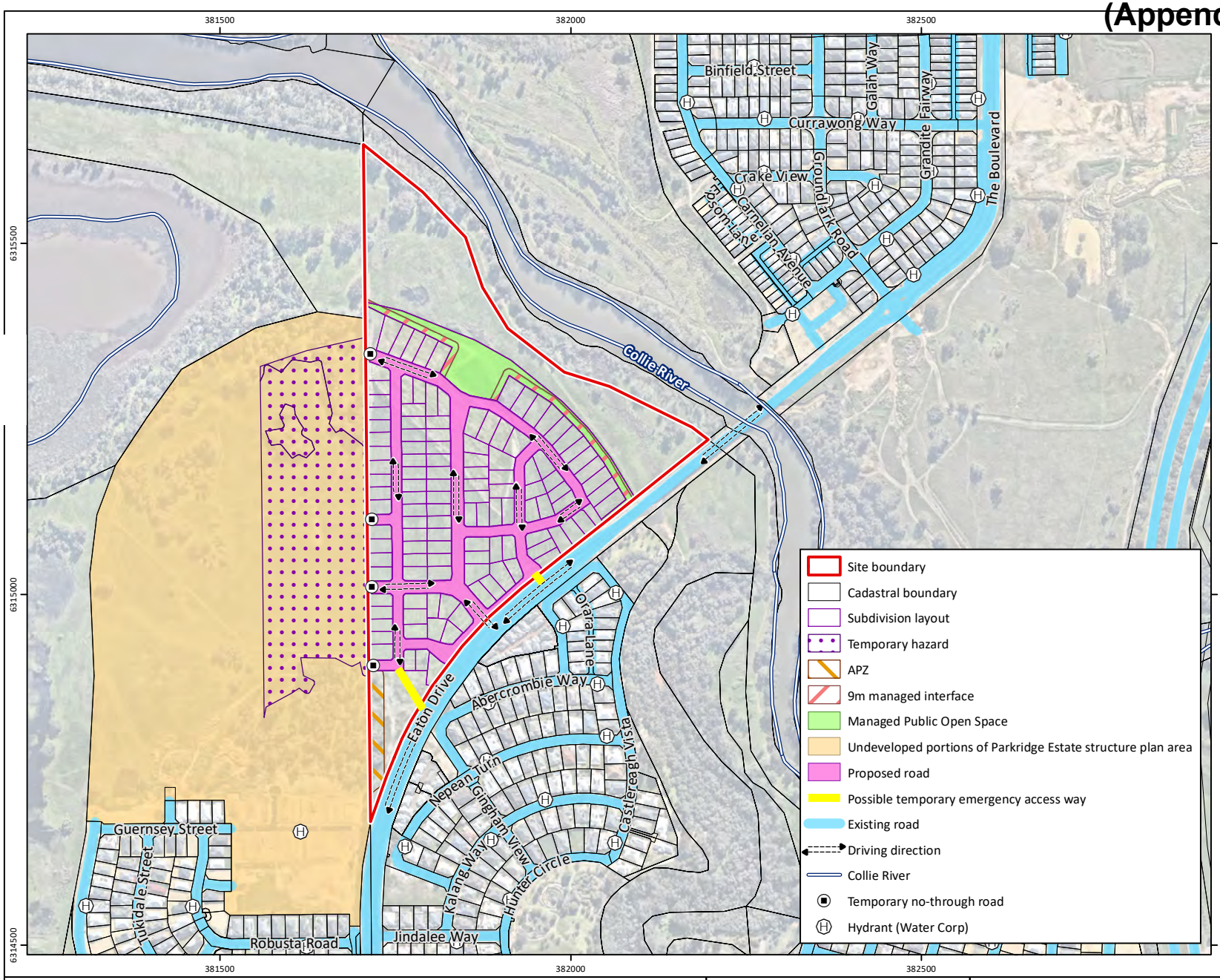
©Landgate (2024). Nearmap Imagery date: 20/06/2024



Development Location
All new habitable buildings are to be located in an area that can achieve BAL-29 or less.

Asset Protection Zone
Each lot is required to be managed as an asset protection zone and achieve low threat. The asset protection zone can also include areas of managed public open space and/or road reserve.

Temporary Hazards
Until development in accordance with the Parkridge Estate structure plan is progressed or the area is subject to ongoing fuel load management, temporary hazards may result in BAL ratings to lots directly adjacent that will not be present in the long-term. In-lot setbacks may be required to achieve BAL-29.

Building Construction Requirements
Where designated bushfire prone, Class 1, 2, 3 and associated 10a buildings will need to be constructed in accordance with BAL ratings determined as per AS 3959.

Vehicle Access
- All roads will achieve the public road requirements as per A3.2 of Appendix Four of the Guidelines or as agreed with the Shire of Dardanup.
- Access to multiple destinations will be provided for each stage of development, unless agreed otherwise with the Shire of Dardanup.
- Where a temporary emergency access way is required to provide multiple access in the instance where development the west is not progressed, this can be provided in one of the locations indicated or as agreed with the Shire of Dardanup. The emergency access way is to be provided in accordance with Appendix Four of the Guidelines unless agreed otherwise.
- Temporary no-through roads are to be provided with a suitable turning area and satisfy the requirements of Appendix Four of the Guidelines.

Water Supply
The development will be serviced by a network of reticulated water hydrants.

Figure 4: Spatial Representation of Bushfire Management Strategies

Project: Bushfire Management Plan
Lot 3001 Eaton Drive (Southwark), Eaton
Client: Ardross Estates (S.A.) Pty Limited

Plan Number:
EP21-030(04)--F11
Drawn: GAR
Date: 19/09/2024
Checked: CSR
Approved: KK
Date: 24/09/2024

N

0 100 200 300
Metres
Scale: 1:8,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used
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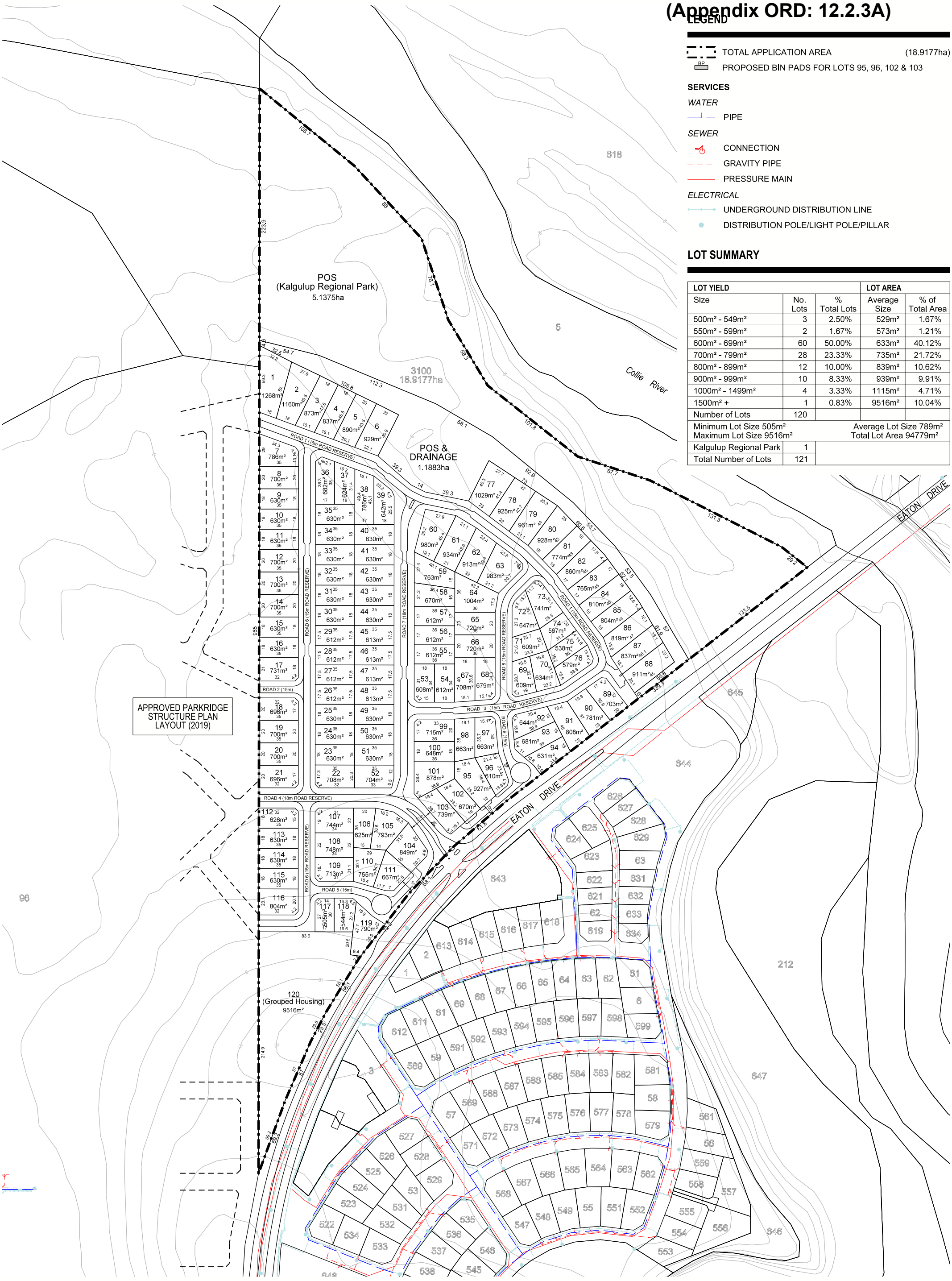
Appendix A

Subdivision Plan

(Appendix ORD: 12.2.3A)

(Appendix ORD: 12.2.3A)



LEGEND

TOTAL APPLICATION AREA (18.9177ha)

BP PROPOSED BIN PADS FOR LOTS 95, 96, 102 & 103

SERVICES

WATER

PIPE

SEWER

CONNECTION

GRAVITY PIPE

PRESSURE MAIN

ELECTRICAL

UNDERGROUND DISTRIBUTION LINE

DISTRIBUTION POLE/LIGHT POLE/PILLAR

LOT SUMMARY

LOT YIELD			LOT AREA	
Size	No. Lots	% Total Lots	Average Size	% of Total Area
500m² - 549m²	3	2.50%	529m²	1.67%
550m² - 599m²	2	1.67%	573m²	1.21%
600m² - 699m²	60	50.00%	633m²	40.12%
700m² - 799m²	28	23.33%	735m²	21.72%
800m² - 899m²	12	10.00%	839m²	10.62%
900m² - 999m²	10	8.33%	939m²	9.91%
1000m² - 1499m²	4	3.33%	1115m²	4.71%
1500m² +	1	0.83%	9516m²	10.04%
Number of Lots	120			
Minimum Lot Size 505m² Maximum Lot Size 9516m²			Average Lot Size 789m² Total Lot Area 94779m²	
Kalgulup Regional Park	1			
Total Number of Lots	121			

Plan of Subdivision - Freehold

LOT 3001 EATON DRIVE, EATON

An Ardross Estates Project

DRAFT

plan: 17/079/018A
date: 14/06/2024
designed: BDM
scale: 1:3000@A3 | 1:1500@A1
grid: PCG 94
checked: BDM
0 30 60m
aerial: -
drawn: JB

Taylor Burrell Barnett Town Planning & Design
Level 7, 160 St Georges Terrace, Perth WA 6000
e: admin@tbbplanning.com.au
p: (08) 9226 4276

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ALL AREAS AND DIMENSIONS DISPLAYED ARE SUBJECT TO DETAIL SURVEY.

Taylor Burrell Barnett

(Appendix ORD: 12.2.3A)

Attachment I

Needs Assessment

(Appendix ORD: 12.2.3A)

pracsys.

ARDROSS GROUP OF COMPANIES

Needs Assessment

Final Report

January 2022

Document Control				
Document Version	**Description**	**Prepared By**	**Approved By**	**Date Approved**
v 1.0	Draft report	Esther Buckeridge	Dawson Demassiet-Huning	23.12.2021
v 2.0	Final report	Esther Buckeridge	Dawson Demassiet-Huning	12.01.2022

Disclaimer

This report has been prepared for Ardross Group of Companies**.** The information contained in this document has been prepared with care by the authors and includes information from apparently reliable secondary data sources which the authors have relied on for completeness and accuracy. However, the authors do not guarantee the information, nor is it intended to form part of any contract. Accordingly, all interested parties should make their own inquiries to verify the information and it is the responsibility of interested parties to satisfy themselves in all respects.

This document is only for the use of the party to whom it is addressed and the authors disclaim any responsibility to any third party acting upon or using the whole or part of its contents.

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1 INTRODUCTION

1.1 Background

This report provides a Needs Assessment to consider whether there is sufficient demand for planned retail and non-retail uses in the MillBridge Private Estate Structure plan, specifically in the Southbank and East Millbridge area that are located in the suburbs of Eaton and Millbridge respectively within the Shire of Dardanup. Southbank is planned to be developed mainly for residential purposes, with some commercial tenants relating to tourism (i.e., cafes, restaurants, a delicatessen, an ice creamery/confectionery and speciality stores) and offices on the Collie River. East Millbridge is envisaged to be a local centre providing for the daily to weekly household shopping needs of East Millbridge residents with walkable access. The centre is intended to complement a recreation area and primary school; however, the Department of Education has not confirmed that the site will be used for a school.

The most recent plans for Southbank and East Millbridge provide for an estimated 1,000m^2 and 3,000m^2 of commercial floorspace respectively.[1] Shop/Retail floorspace at each site was limited to 400m^2 and 1,000m^2 respectively.

Ardross Group of Companies opened the East Millbridge commercial locations for expressions of interest from private operators. No operators responded, indicating there is limited demand for commercial uses. Ardross Group of Companies has therefore requested an independent Needs Assessment to assess the level of demand for retail and non-retail uses at both locations. Pracsys has been engaged to undertake the Needs Assessment to determine the level of demand for commercial uses. The viability of 400m^2 of Shop/Retail floorspace at Southbank and 1,000m^2 at East Millbridge is tested quantitatively; the viability of retail and non-retail uses at each site is further assessed through qualitative analysis.

1.2 Needs Assessment Purpose and Objectives

The draft State Planning Policy 4.2: Activity Centres provides guidance for regional areas to assist in the planning of activity centres. According to the draft SPP 4.2 Activity Centre Strategy: *'The need for activity centre uses refers to the scale and mix of residential and non-residential uses likely to be needed within a catchment area over the plan period (10 years for Precinct Structure Plans).'*

A needs assessment should measure demand for the area and identify the scale of supply necessary to appropriately accommodate this demand in square metres Net Lettable Area (NLA).

[1] The structure plan included references to both 1,000m^2 and 1,200m^2 commercial floorspace, the lesser was included in the analysis.

This needs assessment follows the requirements of draft SPP 4.2 Implementation Guidelines to consider and assess demand for activity centres uses and the ultimate viability of the proposed centres based on comparison of demand with supply. The assessment is based on facts and unbiased evidence[2].

The key objectives of the report are to:

- Review drivers of floorspace, including forecast population growth, socio-economic characteristics and property market profile
- Define the catchment area of each centre being assessed
- Evaluate the competitive environment including existing and planned floorspace supply (including expansions and new developments)
- Assess whether Shop/Retail floorspace for each proposed development is viable at their sites
- Assess the viability of other commercial uses at the sites

1.3 Gravity Model Methodology

Pracsys uses a proven retail gravity model methodology to examine the supply of and demand for retail floorspace within a defined catchment and estimate the potential impact of proposed retail developments. The Retail Gravity Model (also known as Huff's Gravity Model) is a modified version of Sir Isaac Newton's Law of Gravitation. The Gravity Model is a popular model widely used in international trade modelling, transport modelling and regional planning. Retail Gravity modelling studies retail supply, and the probability of a customer (demand) visiting a particular centre. The model accounts for the distribution and attractiveness of competing centres, along with the distance a customer will have to travel to each centre. Floorspace quantum (m^2) is used to represent the attractiveness of retail centres. Customers are willing to travel farther to shop at large centres, representing a higher level of attraction (they can generally satisfy multiple needs in one trip to a larger centre, which also contains a higher proportion of comparison goods).

The model provides an objective method of distributing expenditure among centres. Calibration is used to match the calculated distribution of expenditure to actual published turnover levels, optimising the model outputs. Having established a benchmarked current distribution of expenditure, new floorspace can be introduced and changes in expenditure distribution across time can be examined, allowing for various retail centre transformations such as planned expansions and new developments. This comprehensive approach creates a distribution of expenditure that is fundamentally unbiased, as it is based on mathematical rules. It is a widely used approach that has been accepted by the Department of Planning, Lands and Heritage and Western Australian Planning Commission (WAPC) through the review of a wide range of Structure Plans, Local Commercial Strategies and Retail Sustainability Assessments.[3] For more information on the gravity modelling methodology, please see Appendix 1: Gravity Modelling Methodology.

[2] Draft SPP 4.2 Implementation Guidelines
[3] For example, in April 2014, the West Australian Planning Commission approved the Melville City Centre Structure Plan, which proposed the expansion of the Garden City shopping centre. The RSA prepared by Pracsys in support of the application was based on gravity modelling. Please see Melville City Structure Plan 2015.

1.4 Market Share

For a more specialised retail strip such as the Southbank development, market share approach was used for the Needs Assessment to apportion the anticipated expenditure among competing café and restaurant offerings. Please refer to section 4.1 for a more detailed explanation of the apportionment calculation used for the Southbank Needs Assessment.

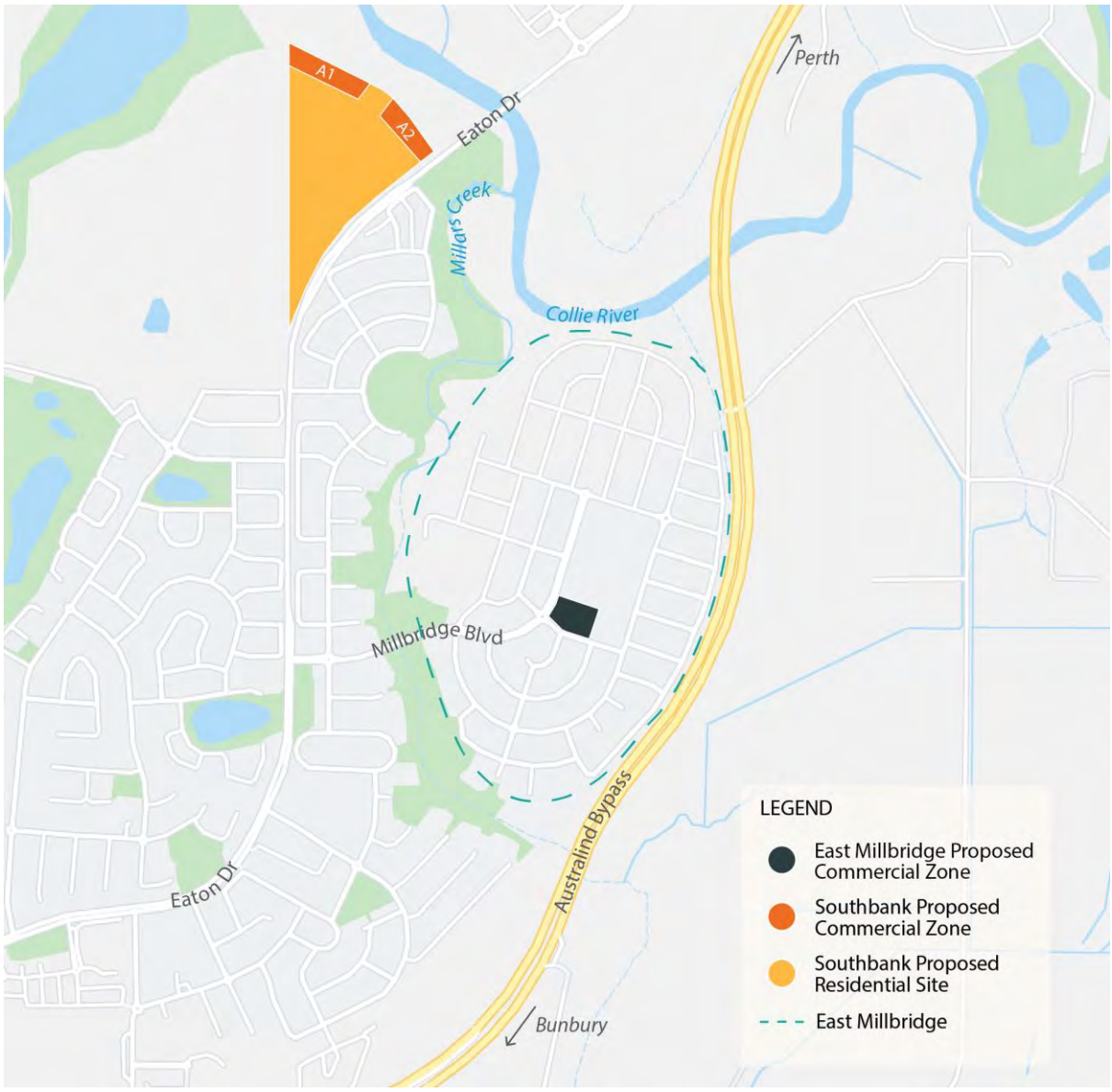
1.5 Non-Retail Assessment

The viability of non-retail floorspace is considered quantitatively by using retail floorspace as a proxy. Retail operators are generally the anchor tenants of activity centres that drive consumer activity and support non-retail uses. The suitability of proposed non-retail components of developments was further assessed by applying principles of activation and a qualitative assessment of relevant commercial considerations. The analysis examines the business preferences and other factors that contribute to the success of a development.

2 DEVELOPMENT CONTEXT

The analysis considers two planned commercial developments, one in Southbank and the other in East Millbridge (Figure 1).

Figure 1. Proposed developments



Source: Ardross Group 2021

2.1 Southbank Proposed Development

Based on the information provided, a hypothetical development concept was used consisting of shop retail floorspace and offices. For the purpose of analysis, 400m^2 was allocated to cafes and restaurants; it was assumed the remainder would be for office-based uses.

2.2 East Millbridge Site

The area referred to as East Millbridge is effectively an island, as it is cut off from other areas by the Collie River to the north, Australind Bypass to the east and Millars Creek to the west and the south. The proposed commercial development is situated at the centre of this island (the island is marked by the dotted grey line) (Figure 1). The residential component of the area has been mostly developed with an additional 130 dwellings remaining to be developed.

East Millbridge Proposed Development

The current concept includes a planned total Shop/Retail Net Lettable Area (NLA) of 1,000m^2, with the majority allocated to take home food retail through a proposed supermarket (500m^2). Based on the information provided, a hypothetical local centre was created consisting of a grocery store, newsagent, hairdresser, chemist, café and clothes retailer.[4]

Figure 2. Development Components[5]

Component Shop/Retail	Floorspace NLA (m^2)
Supermarket	500
Newsagent	100
Hairdresser	100
Pharmacy	100
Café	100
Clothes retailer	100
Total Floorspace	**1,000m^2**

Source: Pracsys 2021

The mix of uses is used to inform the potential turnover requirements of the Shop/Retail floorspace at the proposed centre (see Section 5, East Millbridge Needs Assessment). Approximately 2,000m^2 has been allocated to community and other non-retail services; the demand for these uses has been considered qualitatively.

[4]Southbank@eaton & East Millbridge Amended Structure Plan, page 16
[5] SPP4.2 (2010) defines Shop/Retail NLA as not including tea rooms, plant rooms, toilets, cleaner's cupboards and other service areas, all of which may be found in Back of House. Accordingly, Back of House floorspace is not included as NLA

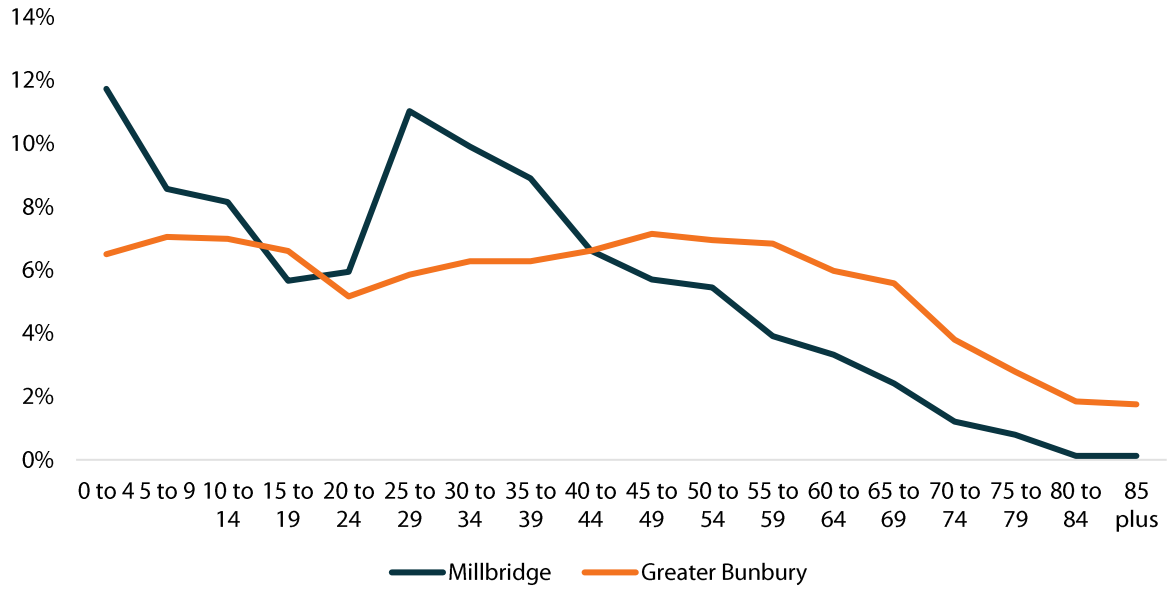
3 DEMAND ANALYSIS

This section compares the demographic and socio-economic profile of Millbridge to the Greater Bunbury area to provide an understanding of the demand for goods and services in the area. Given Southbank has not been developed yet, it has been assumed that Southbank will have a comparable demographic profile to Millbridge. Future dwelling estimates are an exception as the number of dwellings to be developed at Southbank is known. Maps of the Millbridge area and Greater Bunbury area can be found at APPENDIX 2: .

3.1 Age Profile

Millbridge exhibits a different demographic profile to the Greater Bunbury benchmark (Figure 3), with a higher proportion of people aged 0 to 4 (11% versus 6%), 5 to 9 (8% versus 7%) and 10 to 14 (8% versus 6%), as well as those aged 25 to 29 (11% versus 5%), 30 to 34 (9% versus 6%) and 35 to 39 (8% versus 6%). This reflects that Millbridge comprises of a higher concentration of working-age adults with young children than the Greater Bunbury average. This may indicate increased expenditure on childcare and certain convenience retail goods and services. There are three childcare providers in proximity to the Eaton Fair Shopping Centre currently.

Figure 3. Millbridge Demographic Profile

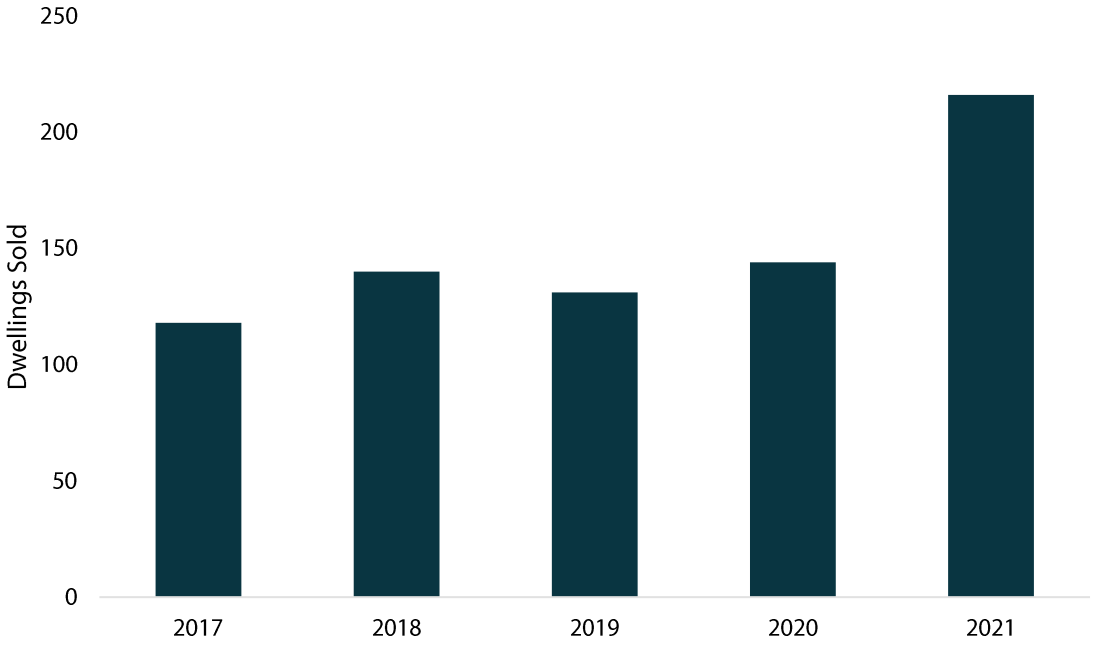


Source: ABS 2016, Pracsys 2021

3.2 Property Market

Property market data provides an understanding of current property and development trends. In 2021, the number of house sales in Millbridge increased by approximately 74% and the median sales price of houses increased by 8.2% (Figure 4).[6]

Figure 4. Dwelling Sale Trends in Millbridge



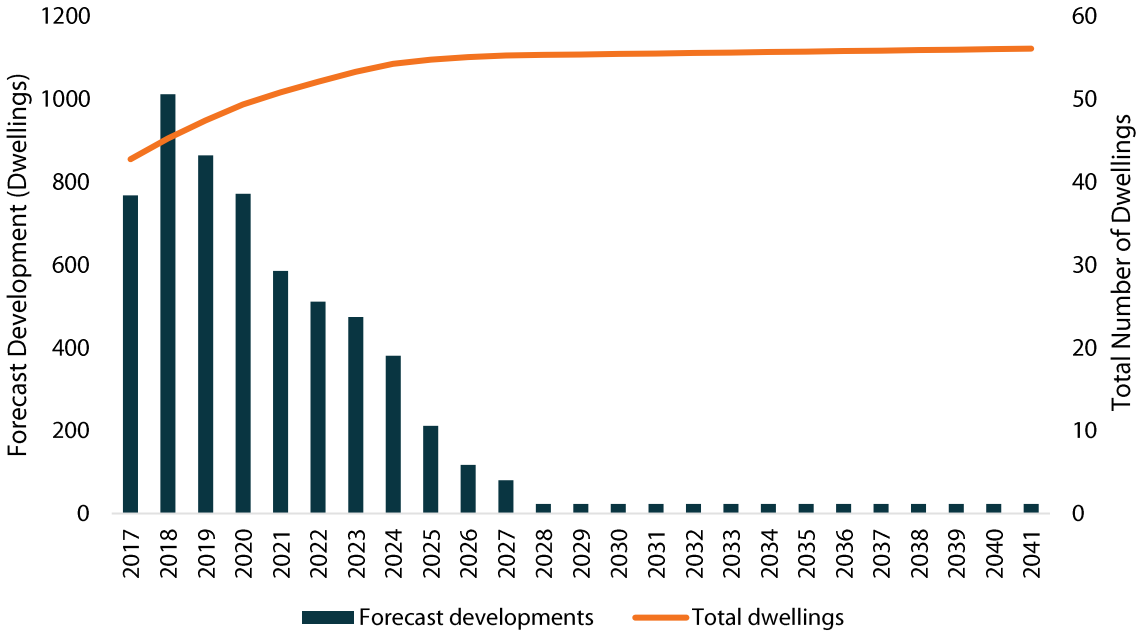
Source: REIWA 2021

This shift is likely linked to the COVID-19 pandemic and associated restrictions; it is unclear how long it will endure. The Needs Assessment has been undertaken at full development to account for potential growth.

Dwelling projections show that most new housing developments in Millbridge are expected to be completed by 2028 (Figure 5).

[6] REIWA 2021, Suburb Profile Millbridge. Available from: https://reiwa.com.au/suburb/millbridge/

Figure 5. Forecast Residential Development in Millbridge



Source: Forecast ID 2021, Pracsys 2021

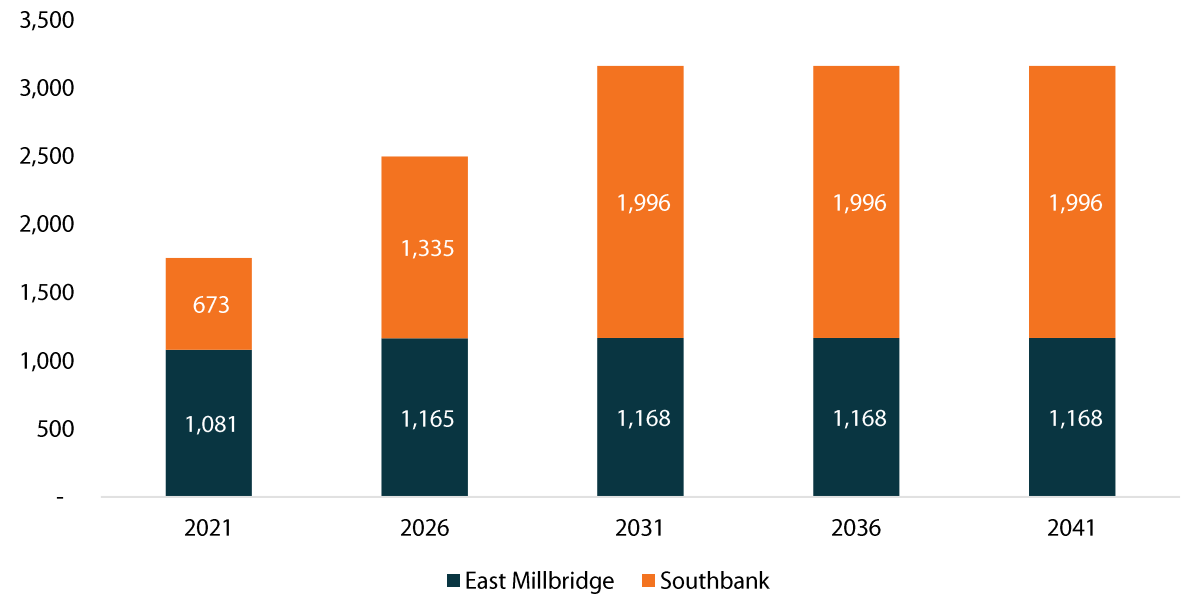
Full development has been assessed at 2031 for both developments, including growth at the relevant developments and any surrounding areas that are included in analysis catchments (see Sections 4 and 5).

3.3 Dwelling Growth

The catchment areas of Southbank and East Millbridge are estimated to contain 673 and 1,081 dwellings respectively in 2021 (Figure 6).[8] Based on dwelling growth forecasts, the number of dwellings in the Southbank and East Millbridge catchment areas is expected to grow to 1,996 and 1,168 respectively by 2031. From 2031 onwards, most of the residential developments are expected to be completed.

[8] The ABS Census 2016 dwelling count by SA1 areas was used to estimate the 2016 number of dwellings in the catchment.

Figure 6. Catchment Area Dwelling Growth Forecast



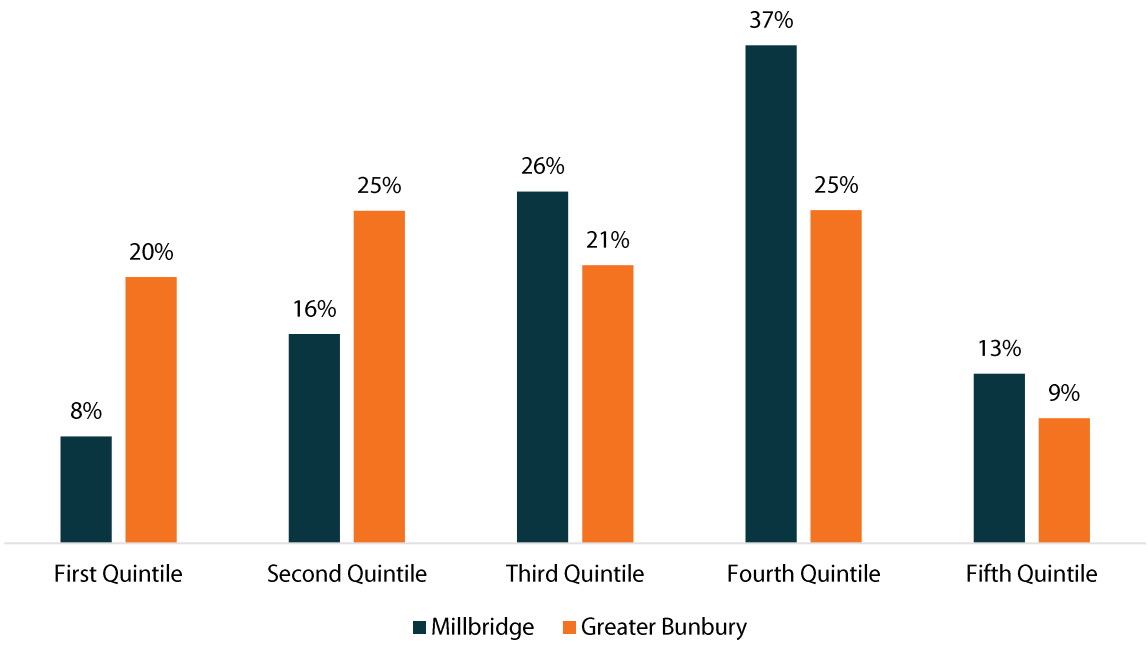
Source: ABS 2016, Forecast.id 2020, Pracsys 2021

The growth of Southbank will foster and support demand for goods and services; however, Millbridge is only expected to grow 8% between 2021 and 2031.

3.4 Income

Income demographics play an important role in the success of retail developments, as the level of spending on retail goods and services is primarily determined by household income. Generally, lower income quintiles spend a higher proportion of their income on basic goods and services; upper income quintiles have more disposable income available to spend on non-essential retail items. ABS Census data has been used to assess the distribution of household income within Millbridge (Figure 7).

Figure 7. Millbridge Population Weekly Income Profile



Source: ABS 2016, ABS HHES Survey 2015/2016, Pracsys 2021

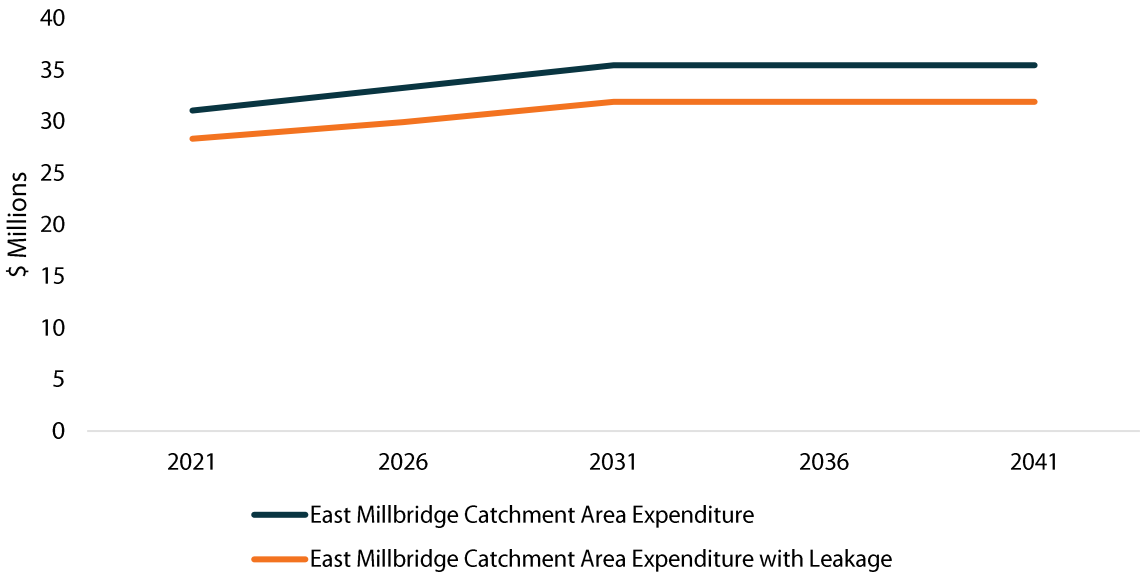
A higher proportion of households are in the third quintile (26% versus 21%), fourth quintile (37% versus 25%) and fifth quintile (13% versus 9%) compared to Greater Bunbury. This relatively high number of higher income households in the catchment indicates a slightly higher than average level of discretionary spend within the catchment that will support greater levels of comparison shopping (i.e. clothing, footwear, etc.). Comparison uses are not likely to be provided/not suitable at the proposed locations.

3.5 Retail Expenditure

ABS Household Expenditure Survey data was used to estimate the average spend per household by income quintile, from which the total expenditure pool of the catchment has been derived. The model combines propensity to spend on commodities based on household income quintiles to derive the total Shop/Retail expenditure in the area. For modelling purposes, the complete development of East Millbridge and Southbank was assumed to occur in 2031.

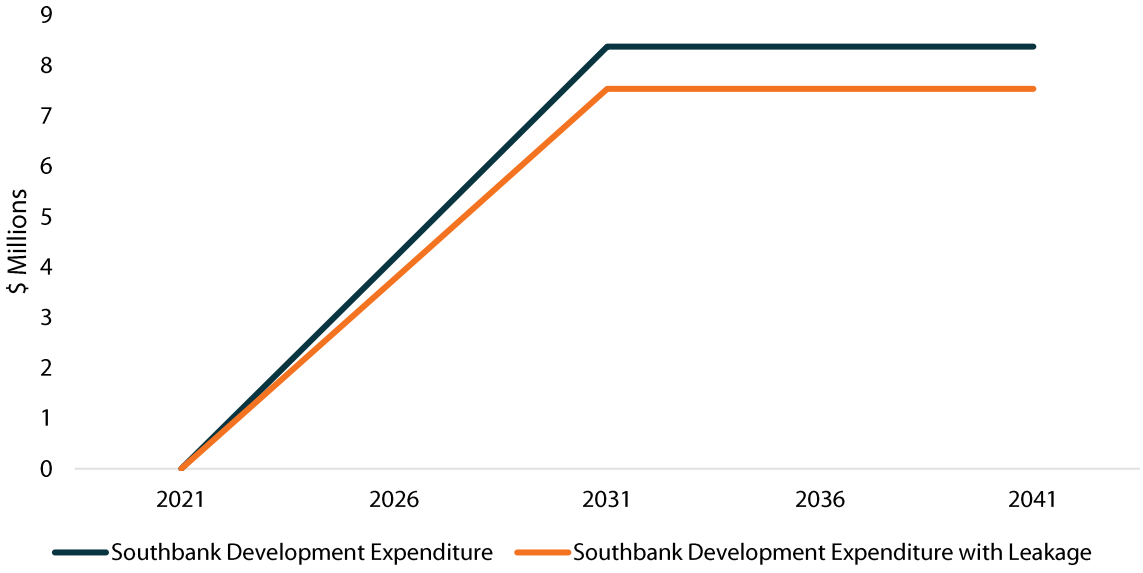
Given projected household growth, Shop/Retail expenditure in the East Millbridge catchment area is estimated to increase from $31 million in 2021 to $35 million in 2031, reflecting growth of 13 per cent (Figure 8). From 2031 onwards, shop-retail expenditure is predicted to plateau at $35 million as the development is completed. Shop/Retail expenditure in the Southbank catchment area is estimated to increase from $0 in 2021 to $8 million in 2031, capturing the new dwellings anticipated in the Southbank development (Figure 9). Some of the turnover is projected to be lost to online leakage; however, this is expected to be less prominent in respect to convenience retail than other types, such as comparison retailing. The effect of online leakage on the viability of the proposed development will therefore be minimal.

Figure 8. East Millbridge Catchment Area Shop/Retail Expenditure Pool - 2021 to 2041



Source: ABS Census 2016, ABS HHES Survey 2015/2016, Pracsys 2021

Figure 9. Southbank Development Shop/Retail Expenditure Pool - 2021 to 2041



Source: Ardross Group 2021, ABS HHES Survey 2015/2016, Pracsys 2021

4 SOUTHBANK NEEDS ASSESSMENT

4.1 Needs Assessment - Quantitative

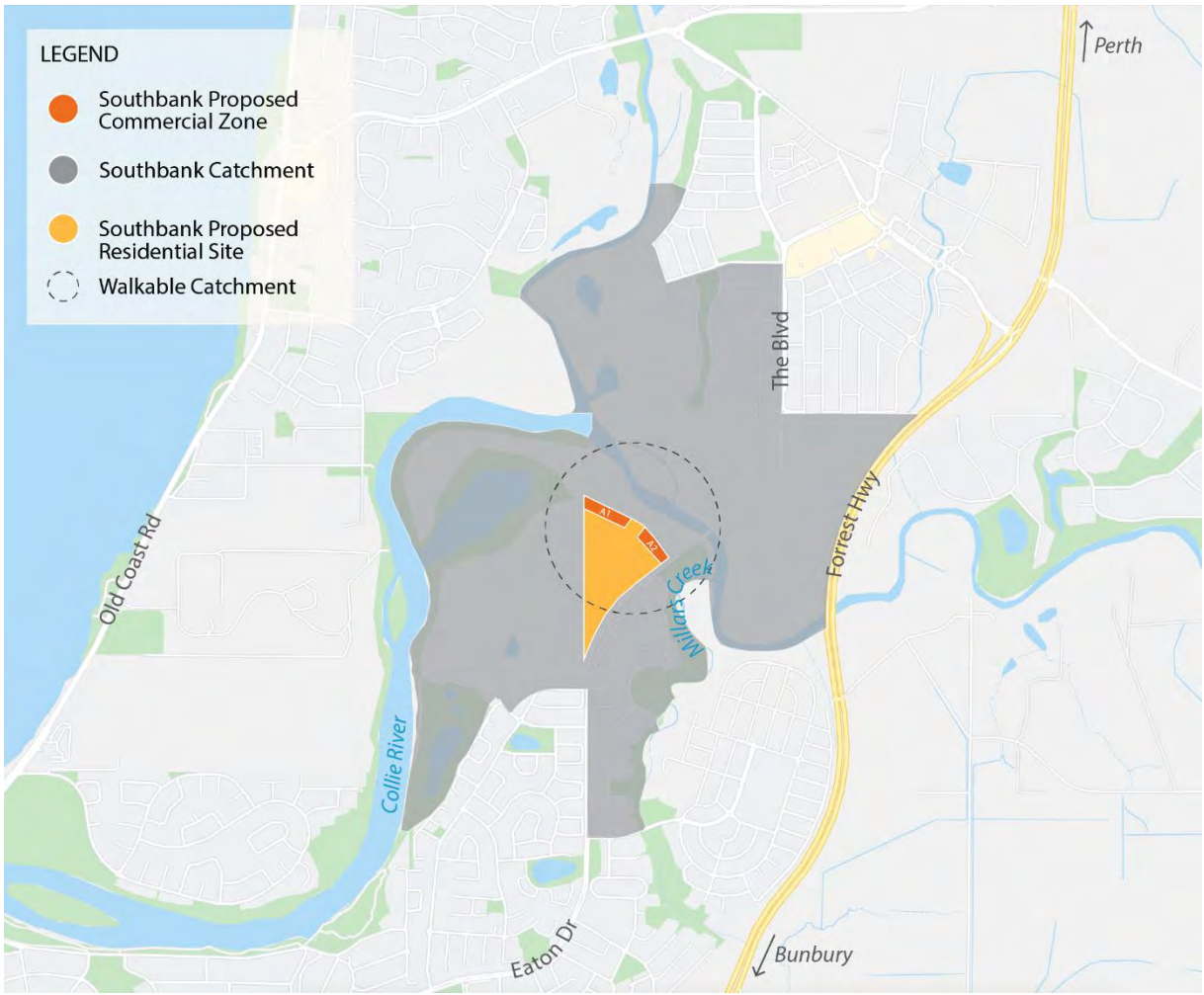
Shop/Retail Context

The quantitative assessment considers the viability of Shop/Retail floorspace at the Southbank location. Shop/Retail uses can be used as a proxy for overall commercial viability of an activity centre as it generally serves as the primary attractor of consumers.

The feasibility calculation has assumed 400m^2 of Shop/Retail floorspace based on the Structure Plan which identified potential tourism uses such as café, restaurant and ice creamery floorspace as suited to the foreshore strip.

The viability of uses at the location considers both local expenditure and visitor expenditure. The catchment area for the Southbank site includes residents in Treendale and west Millbridge (Figure 10).

Figure 10. Southbank Catchment Area



Source: Ardross Group 2021, Pracsys 2021

Shop/Retail Viability

A market share approach was used to test the viability of the Southbank development. The viability of Shop/Retail floorspace was calculated by evenly apportioning total expenditure on cafes/restaurants by locals living in the Southbank catchment area among cafes/restaurants reasonably expected to be frequented on a regular basis. The cafes/restaurants included in the apportionment calculation were within 17 minutes driving time of the Southbank catchment area, the average time people are prepared to travel to reach a local business (Figure 11).[9] Note that the even apportionment of expenditure favours the proposed development as several cafes are in large centres that attract high levels of passing traffic that the Southbank development will not receive.

Figure 11. Cafes/restaurants within 17 minutes driving time

café/restaurant	Address
Small's Bar	48/2 Recreation Dr, Eaton
Nineteen 59	Council Dr, Eaton
Gaetano Cucina	52/2 Recreation Dr, Eaton
Biggie Burger Co	38/2 Recreation Dr, Eaton
The Nile Grill and Kebabs	2 Recreation Dr, Eaton
Spicy Pan	2 Recreation Dr, Eaton
Eatin Fresh	2 Recreation Dr, Eaton
Café Merchant	2 Recreation Dr, Eaton
San Churro	2 Recreation Dr, Eaton
Soul of Asia	2 Recreation Dr, Eaton
Camiles deli Social Australind	9 The Promenade, Australind
Treendale Bakery	6/34 The Promenade, Australind
Kaya Treendale	2/38 The Promenade, Australind
Full of Beenz Coffee	157 Grand Entrance, Australind
Tandoori Flame Indian	34 The Promenade, Australind
Asian Kitchen	8/38 The Promenade, Australind

Source: Google Maps 2021

Total expenditure by locals living in the Southbank catchment area on cafes/restaurants was $3,124,091 per annum, of which $195,256 was apportioned to Southbank cafes/restaurants. Cafe and restaurant floorspace of 400m^2 requires turnover of approximately $2,600,000 per annum to remain viable based on established viability benchmarks (see Section 5.1, Figure 15). This leaves a gap of $2,404,744 that would need to be captured through visitor expenditure.

[9] Bright Local, 2021. Available from: https://www.brightlocal.com/research/local-business-travel-times/

Approximately 152 tourists per day would need to spend their total daily food and beverage expenditure (that is $43 – based on South West Region average tourism expenditure[10]) at the location. This equates to over 55,000 visitors per year; to provide context, the Bunbury Visitor Centre only receives 80,000 visitors per annum. The proposed development is not located at a known tourist attraction and will not be able to attract this level of visitation. Additionally, tourists are likely to make purchases at multiple food and beverage venues across a day, further reducing the potential revenue available to operators at the site.

The potential revenue available to the Southbank development from local residents could support approximately 30m^2 of Shop/Retail floorspace. This does not account for the return required to cover construction costs and is not considered large enough to be sustainable in isolation. The potential revenue from tourism is likely highly variable and would present high levels of risk to any potential operator, especially as the location is not a known tourist area. A built form solution is therefore seen as unviable; providing space for temporary activation such as food vans is seen as a suitable option for this location.

4.2 Needs Assessment - Qualitative

This section considers the feasibility of the Southbank development by analysing the factors that support/detract from the viability of commercial activity.

The Six Principles of Activation summarises the above-mentioned factors that can contribute to the success of a development and have been applied to the Southbank development (Figure 12).

Figure 12. Southbank and the Six Principles of Activation

Principle	Explanation	Application	Implication
Purpose of Place	Consider what the place represents to its target user population (e.g. residents, workers, visitors)	Southbank is intended for predominantly residential living taking advantage of proximity to the Collie River. The foreshore strip of the development (the place) is planned to cater for recreational and leisure purchases rather than the daily needs of residents. The foreshore strip will also support several small businesses	Retail at the foreshore strip will place more reliance on discretionary spending by visitors which has greater variability than resident expenditure
Access	Consider what areas the centres are accessed by	According to current plans, the foreshore strip will be accessed by the roads dividing the two halves of the development (Road 2) and via a path system along the Collie River foreshore	There are limited access points to the site and any visitors would need to know to exit the Forrest Highway and make their way through residential areas to access the development. Extensive signage would need to be used to make the presence of the site known to passers-by.

[10]Tourism WA, 2021. Available from: https://www.tourism.wa.gov.au/Markets-and-research/Destination-insights/Pages/Tourism-region-fact-sheets.aspx#/

			The site is seen as poorly accessible to visitors
Origins	Consider the areas which pedestrian movements begin	Those who drive will enter the foreshore strip from street parking. Pedestrians (most likely residents) will enter via roads intersecting with the foreshore strip. Currently, there is no access to the foreshore strip via public transport	The primary origin for the site will be from residents of the Southbank development. Parking will be the origin for visitors meaning access will be the key decider of visitation
Exposure	Consider the exposure of the place to pedestrian traffic	Because Southbank is isolated, there will be no pedestrian traffic travelling to other destinations	Pedestrian traffic is expected to be limited to residents of the surrounding area who intend to walk along the Collie River. The relative isolation of the foreshore strip reduces the exposure to visitor pedestrian traffic
Destinations	Consider the major attractions that are causing a significant number of people to come to the place	The Collie River is the destination that would cause most people to come to Southbank	While the Collie river may be a destination, this specific location is not a known tourism destination. Additionally, the potential commercial development at the site is not large enough to be an anchor for activation in its own right, particularly in terms of attracting visitation other than local residents
Control	Consider strategic sites that could be considered as future destinations and/or suitable sites for anchor tenants	There are no strategic sites that have been considered as future destinations	There are no established key sites that the site can benefit from.

Source: Pracsys 2021

4.3 Commercial Considerations

Businesses chose their location based on several factors including access, proximity to other businesses, visibility (i.e. pedestrian/vehicular traffic), among others. There are several reasons why businesses would not choose to place their offices at the foreshore strip:

- Businesses usually benefit from agglomeration, where urban areas and clusters of activity boost the productivity of firms located within them.[11] Offices located further away from such areas are likely to be less productive. There are no agglomeration benefits to businesses at the Southbank location
- Relevant office uses such as travel and real estate agents (highlighted in the Structure Plan) are usually located in larger activity centres offering comparison and convenience retail options, where they can benefit from the centre's pedestrian traffic. This location will not provide sufficient levels of pedestrian traffic to benefit office-based businesses
- People visiting the Collie River are not likely to be thinking about purchasing goods and/or services associated with local office related uses such as accounting, real-estate and travel
- While small local businesses could connect with the local community by situating themselves on the foreshore strip, they could also operate as a home-based business at a lower cost and receive the same benefit[12], given the limited potential for visitation driven business
- The proposed Shop/Retail uses at the site are not likely to be viable based on the quantitative analysis. These uses are generally the drivers of visitation to activity centres. Without these uses driving visitation it is highly unlikely office uses would be viable at the site

The site is not found to be suitable for office-based uses based on the assessment and would likely experience high levels of turnover and vacancy if offices are developed.

[11] Harvard Business School, 2015. Available at https://www.hbs.edu/ris/Publication%20Files/16-037_eb512e96-28d6-4c02-a7a9-39b52db95b00.pdf
[12] Australian Government, 2021. Available from: https://business.gov.au/planning/business-structures-and-types/home-based-businesses

5 EAST MILLBRIDGE NEEDS ASSESSMENT

5.1 Needs Assessment – Quantitative

Please refer to section 3.5 for expected shop/retail expenditure in the East Millbridge catchment area.

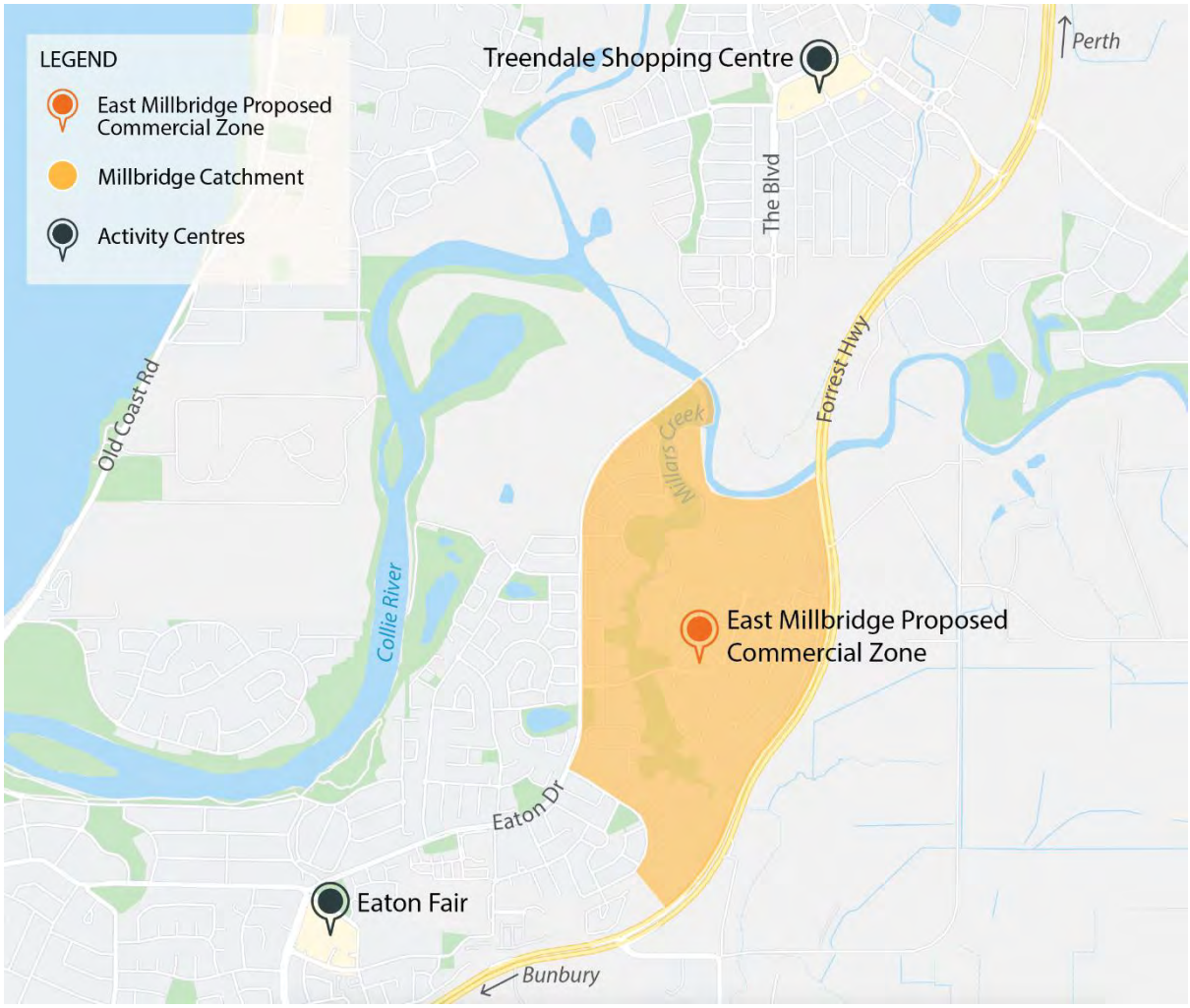
Shop/Retail Context

A catchment area was needed to assess the viability of the East Millbridge Local Centre through the gravity model. A catchment area is the spatial boundary from which a commercial floorspace generates most of its customers. The catchment area definition allows for the measurement of the number of potential customers, their demographics and expenditure potential, as well as an assessment of the competitive environment.

SPP 4.2 states that local centres provide for the day to day needs of local communities. Local and neighbourhood centres play an important role in providing walkable access to services and facilities for communities. According to SPP 4.2, the approximate catchment area of a typical local activity centre is a 1km radius from the centre.

Due to the area referred to as East Millbridge effectively being an island only accessible by Millbridge Boulevard, the modelled catchment area of the prospective centre comprises the extent of the suburb of Millbridge (Figure 13). A larger catchment was not selected because it was reasonably anticipated that residents further away from the proposed centre would choose to travel to other larger centres such as Eaton Fair and Treendale Shopping Centre, particularly as there is only one access and egress point to the East Millbridge area via Millbridge Bvd.

Figure 13. Catchment Area East Millbridge



Source: Pracsys 2021

Existing retail floorspace supply within the trade area has been derived through data from multiple sources, including:

- Property Council Shopping Centre Directory (2018)
- Secondary Research (various structure plans, property manager websites etc.)
- Department of Planning, Lands and Heritage Land Use and Employment Survey (LUES)

Eaton Fair was the only centre included in the analysis based on the following considerations:

- It would be the primary shopping location for current residents as the only access/egress point is via Millbridge Bvd which makes Eaton Fair the closest shopping centre
- The small potential size of the East Millbridge Local centre
- The solitary access and egress point would impact the attractiveness of surrounding residential areas
- The limited access and egress points from west of Eaton Dr would create further barriers for those residents to access the site

This provides a more favourable assessment for the proposed centre as the inclusion of Treendale would increase floorspace supply and reduce the total share of demand available to the site.

Eaton Fair is currently undertaking infrastructure upgrades to support future expansion plans (Figure 14). It has been assumed that the non-road component of Eaton Fair's expansion will be complete by 2026 as the Activity Centre Plan expires in 2027.[13]

Figure 14. Eaton Fair Expansion

Centre	Previous NLA (m^2)	Expanded NLA (m^2)	Additional NLA (m^2)	Year of Expansion
Eaton Fair	15,098	33,894	18,796	Pre-2026

Source: Ardross Group of Companies 2021, Shire of Dardanup 2021

Gravity Modelling and Model Calibration

The retail needs assessment uses gravity modelling to estimate the quantity of Shop/Retail floorspace supportable at the project site. The retail gravity model incorporates the most up to date data on household expenditure and retail floorspace supply.

Floorspace productivity ($/m^2$) benchmarks were used to test the viability of the planned East Millbridge Local Centre (Figure 15).

Figure 15. Benchmark Turnover Productivity

Retail Category	Productivity ($/m2)
Take Home Food	10,000
Take Home Liquor	9,000
Dine Out Food	6,500
Clothing/Footwear	5,000
Convenience Retail	7,000
Bulky Goods Retail	5,500

Source: Colliers 2018

Shop/Retail Viability

The supportable Shop/Retail floorspace at the site was tested by assessing whether the centre at 1,000m^2 Shop/Retail floorspace could attract sufficient turnover to be viable based on the proposed mix of uses. The following hypothetical mix of uses and viable turnover benchmarks were used (Figure 16).

Figure 16. Concept Floorspace Aligned to Benchmark Productivity

Component Shop/Retail	Floorspace (m^2)	Relevant benchmark
Supermarket	500	Take Home Food

[13] Planning Solutions, Eaton Fair Activity Centre Plan. Available from: https://www.dardanup.wa.gov.au/wp-content/uploads/sites/105/2016/05/Eaton-Fair-Activity-Centre-Plan.pdf

Component Shop/Retail	Floorspace (m^2)	Relevant benchmark
Newsagent	100	Convenience Retail
Hairdresser	100	Convenience Retail
Chemist	100	Convenience Retail
Café	100	Restaurant
Clothes Retailer	100	Clothing/Footwear
Total	**1,000**	

Source: Colliers 2018, Pracsys 2021

Based on these floorspaces and the benchmarks, a turnover of $8,250,000 per year would be required for the centre to be viable based on the proposed mix of uses. This equates to a conservative required floorspace productivity of $8,250 per m^2 for the proposed centre to be viable.

Apportioning retail expenditure of the trade area by the proportion of total retail floorspace in the proposed centre indicates at a high level that the proposed centre will not receive the turnover it requires to be viable (Figure 17).

Figure 17. Portion of retail expenditure attributable to East Millbridge

	2021	2026	2031	2036	2041
Proposed Centre Floorspace (m^2)	Nil	1,000	1,000	1,000	1,000
Eaton Fair Floorspace (m^2)	15,098	33,894	33,894	33,894	33,894
Proposed Centre – Percentage of Total Floorspace	0%	3%	3%	3%	3%
Retail Expenditure Attributed to the Proposed Centre ($)	0	952,766	1,015,653	1,015,653	1,015,653

Source: Eaton Fair Activity Centre Plan June 2020, Shire of Dardanup 2021, Pracsys 2021

Gravity modelling considers both the size of the centres and their distance from dwellings. The small catchment used and distribution of residents within proximity of the East Millbridge Local Centre represents a conservatively high scenario in favour of the centre (i.e., it is likely that it would attract less expenditure in real life).

In 2026, the proposed centre was found to turn over at $1,967,341 at a productivity of $1,967 per m^2 based on 1,000m^2 of Shop/Retail floorspace. These metrics are well the below the turnover and productivity required for the proposed centre to be viable and indicate a local centre is not supportable at the site. Modelling was used to determine the future viability of the proposed centre as the catchment population grows and as Eaton Fair Shopping Centre develops (Figure 18).

Figure 18. Modelled Shop/Retail Productivity 2021 - 2041

	2021	2026	2031	2036	2041
Proposed Centre Turnover ($)	Nil	1,967,341	2,143,146	2,143,146	2,143,146

	2021	2026	2031	2036	2041
Proposed Centre Productivity ($/m^2)	Nil	1,967	2,143	2,143	2,143
Gap To Viable Turnover ($)	Nil	6,282,659	6,106,854	6,106,854	6,106,854

Source: Pracsys 2021

Even with population growth improving the proposed centre's performance, the turnover and productivity of the centre remain well below the benchmarked levels required for the centre to be viable. The potential turnover at the site in 2031 would only support 260m^2 of the total 1,000m^2 Shop/Retail floorspace. It should be noted that a centre of 260m^2 in size would not be able to attract the same level of turnover and would not be viable either.

The results further support the conclusion that the proposed centre will not receive sufficient expenditure to remain viable. Based on this analysis, it is recommended that 1,000m^2 of Shop/Retail floorspace is not developed at this location.

5.2 Needs Assessment - Qualitative

This section tests the feasibility of the East Millbridge development by analysing the factors that support/detract from the viability of commercial activity.

The Six Principles of Activation summarises the above-mentioned factors that can contribute to the success of a development and have been applied to the East Millbridge development (Figure 19).

Figure 19. East Millbridge and the Six Principles of Activation

Principle	Explanation	Proposed East Millbridge development	Implication
Purpose of Place	Consider what the place represents to its target user population (e.g., residents, workers, visitors)	The centre caters for the daily and weekly shopping needs of local East Millbridge residents	The centre's viability will depend almost exclusively on East Millbridge residents
Access	Consider what areas the centres are accessed by	The arrival points would be via Millbridge Boulevard and Clayton View	There is currently one access/egress point to the East Millbridge area making it very difficult to access the site.
Origins	Consider the areas which pedestrian movements begin	Pedestrian movements begin from residents' own homes, from bus stops along Millbridge Boulevard and Clayton View, and from parking.	Parking will likely cater to residents and not support access from non-residents. The same is likely for public transport, which is unlikely to support significant visitation as an origin.
Exposure	Consider the exposure of the	Besides local East Millbridge residents walking past, the site would be unlikely to have any	Pedestrian traffic will be limited to East Millbridge residents who are passing by.

	place to pedestrian traffic	exposure from non-residents of East Millbridge.	
Destinations	Consider the major attractions that are causing a significant number of people to come to the place	The planned primary school would have been a major attraction/anchor for the development; however, it is unclear whether the school will be established as there are no plans for development yet even though Millbridge is almost fully developed.	Without a primary school, the centre will not receive as much expenditure from parents incidentally shopping around school drop offs and picks up. A 500m^2 supermarket offering is small and would not be a strong enough anchor to draw residents from surrounding areas
Control	Consider strategic sites that could be considered as future destinations and/or suitable sites for anchor tenants	Apart from the primary school, there has been no other future destinations been proposed for the site.	The primary school is controlled by the Department of Education who have no known plans to develop the site despite the Millbridge being predominantly developed.

Source: Pracsys 2021

5.3 Commercial Considerations

Businesses chose their location based on several factors including access, proximity to other businesses, visibility (i.e., pedestrian/vehicular traffic), among others. There are several reasons why businesses would not choose to place their premises at the East Millbridge location:

- The proposed Shop/Retail uses at the site are not likely to be viable based on the quantitative analysis. Additionally, the potential primary school anchor has no identified plans for development. Shop/Retail uses and the primary school would be the drivers of visitation to the local activity centre. Without these uses driving visitation it is highly unlikely non-retail uses would be viable at the site
- Businesses usually benefit from agglomeration, where urban areas and clusters of activity boost the productivity of firms located within them.[14] Offices located further away from such areas are likely to be less productive. East Millbridge is effectively a residential island and does not have a sufficient population to support office-based businesses, particularly given the fact that many of the residents would use businesses at Eaton Fair when undertaking shopping there
- Community uses such as childcare (highlighted in the Structure Plan) are usually located near larger activity centres offering comparison and convenience retail options, where they can benefit from the centre's visitation. There are three childcare centres in proximity to the Eaton Fair Shopping Centre that likely meet the needs of the area. It is highly unlikely a childcare centre would have sufficient demand from the East Millbridge resident population alone, particularly as many residents would be likely to us the childcare offering at the Eaton Fair Shopping Centre

[14] Harvard Business School, 2015. Available from: https://www.hbs.edu/ris/Publication%20Files/16-037_eb512e96-28d6-4c02-a7a9-39b52db95b00.pdf

- Community uses in general are better able to deliver their services when located in or adjacent to larger centres. There are already significant agglomerations of community services around the Eaton Fair Shopping Centre including Aged Care services, Childcare services, sport and recreation facilities, and the Shire of Dardanup offices, to name a few. The planned expansion of Eaton Fair Shopping Centre will provide additional capacity for such uses and limit the potential demand for these uses to locate in East Millbridge
- While small local businesses could connect with the local community by situating themselves on the foreshore strip, they could also operate as a home-based business at a lower cost and receive the same benefit[15] given the limited potential for visitation driven business at East Millbridge

The site is not found to be suitable for non-retail uses based on the assessment and would likely experience high levels of turnover and vacancy if premises were developed to support these uses.

[15] Australian Government, 2021. Available at https://business.gov.au/planning/business-structures-and-types/home-based-businesses.

6 CONCLUSION

Ardross Group of Companies opened the commercial components of the East Millbridge development to expressions of interest from private operators; however, there was no interest from the market. In response, Ardross Group of Companies requested Pracsys complete an independent Needs Assessment to assess the level of demand for retail and non-retail uses at both locations.

For each development, Pracsys examined the supply and demand for retail floorspace within a defined catchment and replicated the real-life interaction of supply and demand using gravity modelling and market share assessment to determine if there would be sufficient demand for retail to warrant the additional supply of floorspace. Even when all residential developments within the respective catchment areas were completed, there was inadequate demand to support the additional floorspace (Figure 20). This is due to the established activity centre hierarchy providing sufficient supply to meet the demand, particularly with the planned Eaton Fair expansion.

Figure 20. Viability of retail floorspace

Development	Required annual turnover to remain viable ($)	Expected expenditure - complete development ($)	Shortfall ($)
Southbank	2,600,000	195,256	2,404,744
East Millbridge	8,250,000	2,143,146	6,106,854

Source: Pracsys 2021

Pracsys also examined the viability of non-retail floorspace for each development considering relevant commercial considerations and the Six Principles of Activation. On the balance of these considerations and principles, both the Southbank and East Millbridge developments would likely experience high levels of vacancy if the premises were developed.

Given their contexts, the Southbank and East Millbridge developments are expected to be unable to support the proposed commercial uses. Alternative uses of the land such as residential development should be considered to achieve higher and better usage.

7 APPENDIX 1: GRAVITY MODELLING METHODOLOGY

Gravity models allow for the measurement of spatial interaction as a function of distance to determine the probability of a given customer shopping at a centre and provide an approximation of trade area and sales potential for a development. This modelling technique uses the distance between a household and each centre, and a measure of 'attractiveness' to define the probability model. The 'attractiveness' of a centre has been defined by total floorspace and the distance has been calculated by measuring straight-line distances between each centre and population. The gravity model probability formula is shown in Figure 21.

Figure 21. Gravity Model Probability Formula

$$P_{ij} = \frac{\frac{A_{jk}^{a}}{D_{ij}^{ß}}}{\sum_{j=1}^{m} \frac{A_{jk}^{a}}{D_{ij}^{ß}}}$$

P_{ij}	=	Probability of customer living/working in statistical area i shopping at complex j.
A_i	=	Area of floorspace in centre, j in square metres, according to the type of supply, k.
D_{ij}	=	Distance between statistical area of households, i and complex j.
a	=	Area exponent
ß	=	Distance exponent
k	=	Type of supply or expenditure, either Convenience or Comparison
i	=	Statistical area (i=1,...,n)
j	=	Complexes (j=1,...,m)

Source: Carter, C (1993) 'Assumptions Underlying the Retail Gravity Model', *Appraisal Journal,* Vol 61, No 4, pp510; Pracsys (2020)

Figure 22. Gravity Model Demand Formula

$$D_{kj} = \sum_{i=1}^{n} (P_{ij} * E_i)$$

D_{kj} = Demand for retail category k, at centre j.
E_i = Expenditure pool of statistical area i.

Source: Carter, C (1993) 'Assumptions Underlying the Retail Gravity Model', *Appraisal Journal,* Vol 61, No 4, pp510; Pracsys (2020)

Figure 22 shows that the demand for retail category k[16], at centre j, is equal to the sum of the probabilities of customers living in statistical areas i to n, multiplied by the expenditure pool of statistical area i. In other words, the demand for retail is a function of the probability of customer from particular statistical area attending the centre multiplied by the expenditure pool of that statistical area. The expenditure is pool is derived through the population multiplied by its income distribution.

In its core form gravity modelling provides a clearer, reproducible outcome that can be easily assessed. However, it does not consider local factors, including:

- The comparative value proposition of centres (e.g. the presence of an 'anchor' attractor that draws significant market share);
- The brand preference of users; or
- The efficiency of transport networks, as well as geographical barriers (e.g. in some cases it may be easier for customers to access a centre that lies physically further away).

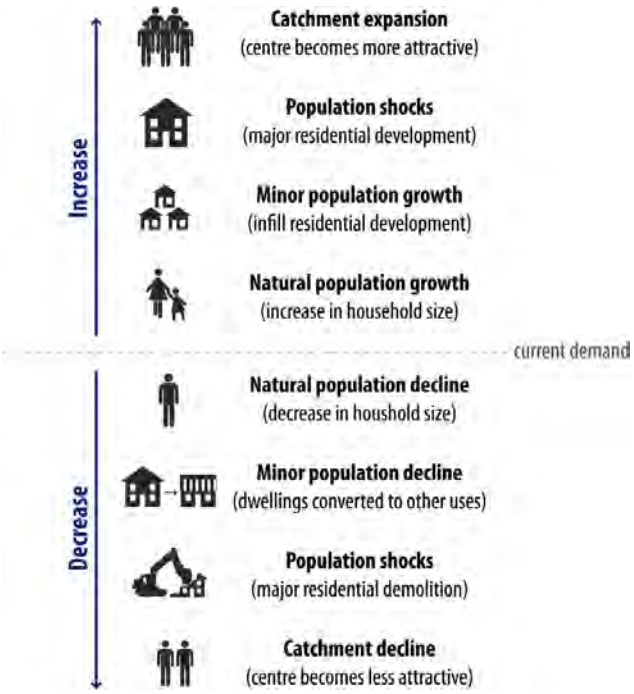
7.1 Drivers of Retail Floorspace Supply and Demand

Demand changes can result in increased or decreased expenditure. The potential causes of demand changes are shown in Figure 23. These largely show that an increasing population increases demand, and vice versa. There are significant amounts of commercial floorspace, especially office floorspace, flagged for the central sub-region of Perth and beyond. There will also be significant numbers of new dwellings provided across Perth. This increase in residents has the potential to boost demand for goods and services in the area.

[16] Retail categories are determined by their PLUC code and whether they are convenience or comparison goods. Convenience goods are day-to-day items such as groceries, pharmaceuticals and fast food. Comparison goods are items where consumers are willing to travel further distances, and are bought less frequently such as clothing, furniture, electronics, or other household items.

Demand can also increase from rising incomes, or wealth, because people have more disposable income to spend on retail. Demand can also be increased by reducing leakage. Leakage for retail is largely caused by online retail, as well as travelling.

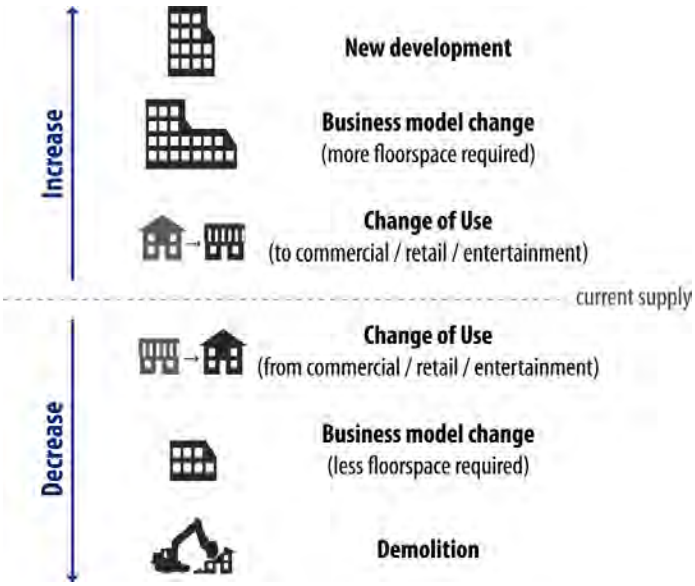
Figure 23. Drivers of Retail Floorspace Demand



Source: Pracsys 2020

Supply changes can result in increased or decreased retail floorspace. The potential causes of supply changes are shown in Figure 19.

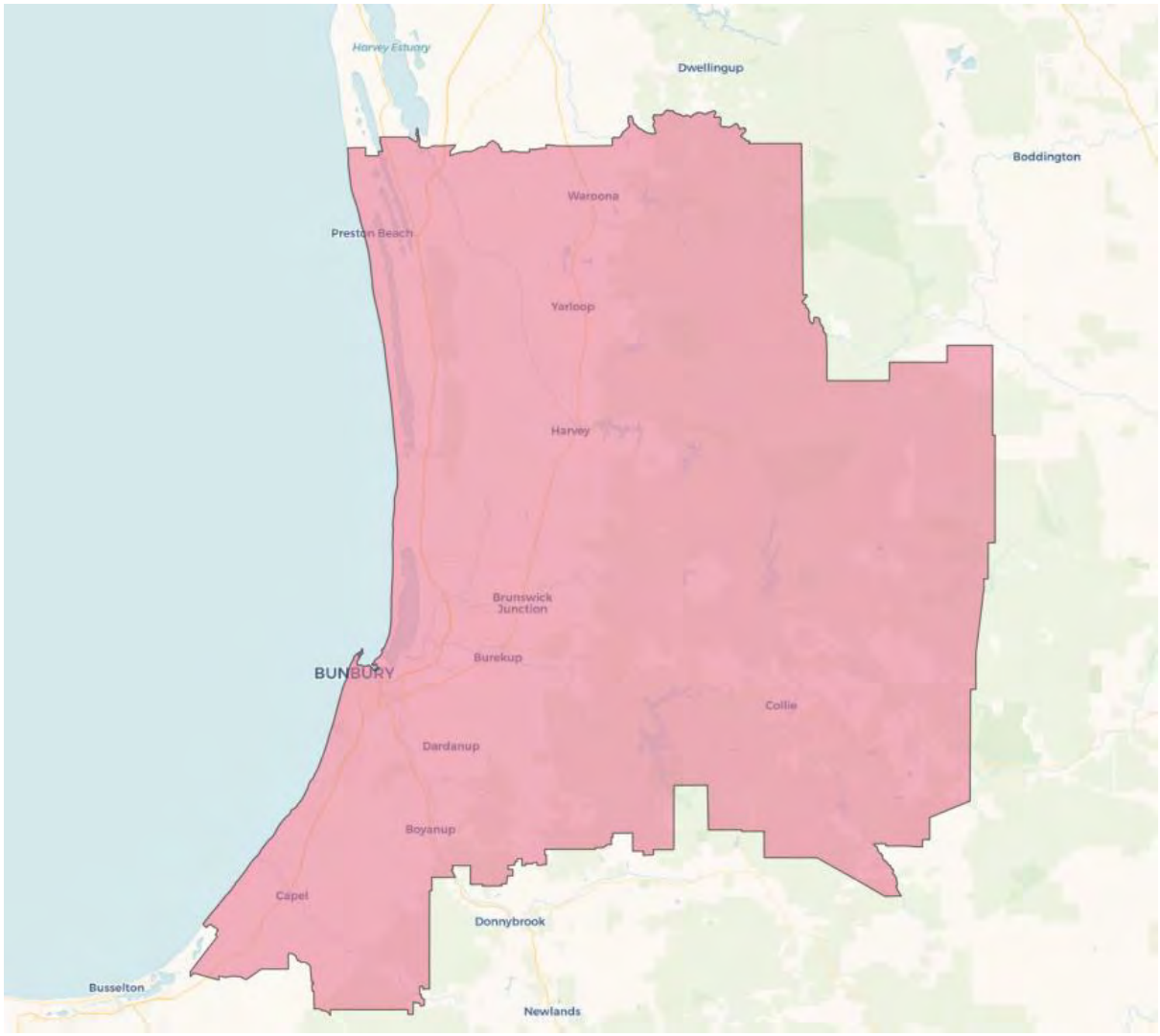
Figure 24. Drivers of Retail Floorspace Supply



Source: Pracsys 2020

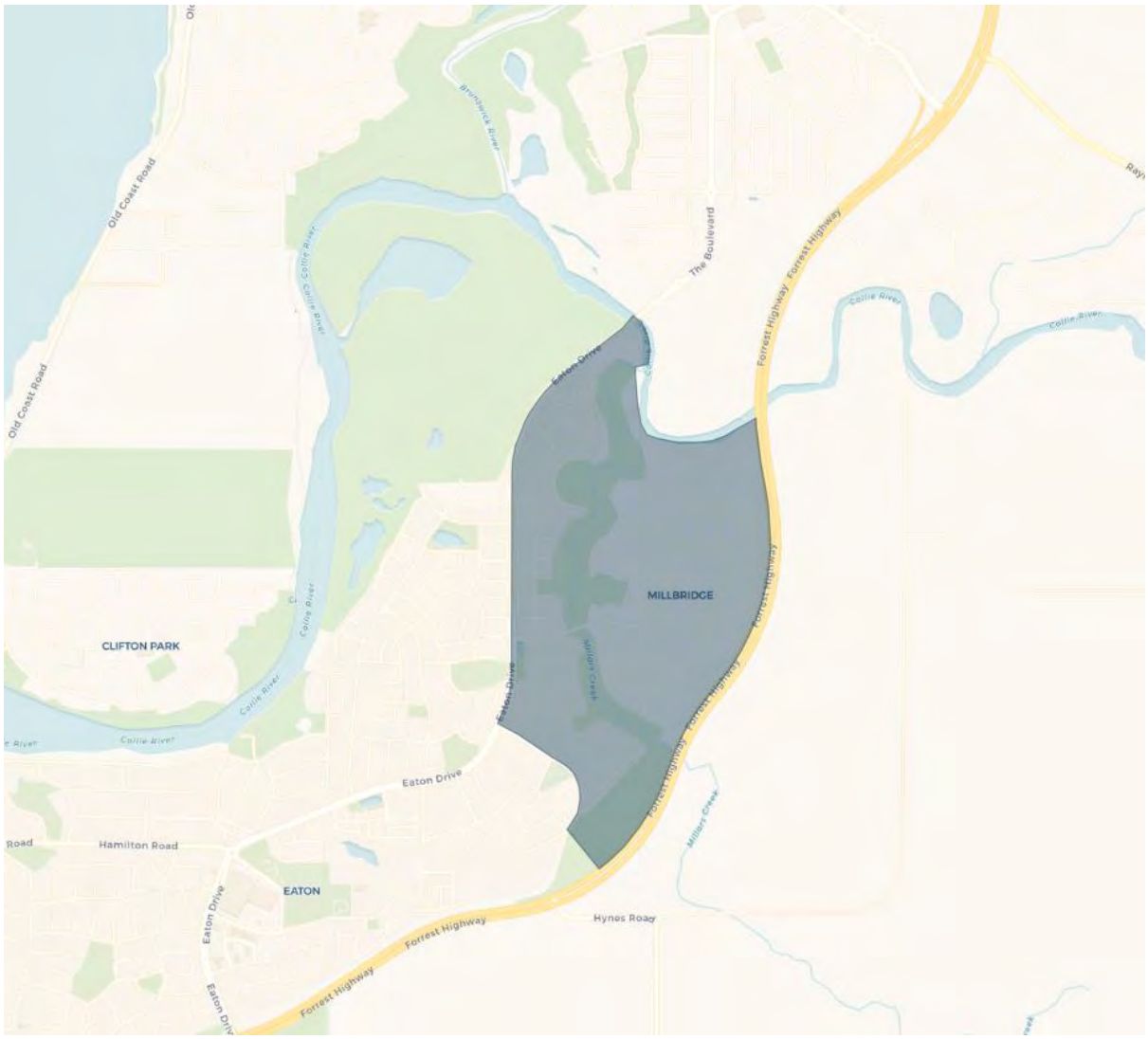
8 APPENDIX 2: MAPS OF MILL BRIDGE AND GREATER BUNBURY

8.1 Map of Greater Bunbury



Source: Pracsys 2021

8.2 Map of Millbridge



Source: Pracsys 2021

Harley Dykstra
SURVEYING | TOWN PLANNING | PROJECT MANAGEMENT

Our Ref: 22294

20 May 2025

Chief Executive Officer
Shire of Dardanup
PO Box 7016,
EATON WA 6232

Via email submissions@dardanup.wa.gov.au

Dear Andre,

Submission on Amendment No. 2 to the Garden of Eaton – Southbank@Eaton Local Structure Plan Prepared by Harley Dykstra on behalf of Parkridge Pty Ltd

This submission has been prepared by Harley Dykstra on behalf of our client, Parkridge Pty Ltd (Parkridge), in response to the advertised Amendment No. 2 to the *Garden of Eaton – Southbank@Eaton* Local Structure Plan.

The land subject to this amendment, commonly known as *Southbank*, is owned by Ardross Estates. Parkridge is the landowner of Lot 9010 Peninsula Lakes Drive, which lies immediately west of the Southbank Structure Plan area. The Parkridge site is also the subject of an approved Structure Plan and a proposed Structure Plan amendment, which is currently under assessment by the Department of Planning, Lands and Heritage.

There has been ongoing and productive engagement between the developers and planning consultants of both the Southbank and Parkridge developments. This collaboration has focused on ensuring a seamless interface between the two sites, with a view to maximising connectivity and coordinated development outcomes.

Parkridge supports the proposed Southbank Structure Plan amendment as advertised by the Shire of Dardanup. The basis for this support and the extent of coordination between the developments is outlined below.

Road Network

The amended Structure Plan provides for an integrated local road network that connects the Parkridge and Southbank sites, while also considering the wider road network context.

The road alignments and connection points have been coordinated to ensure continuity across the developments, including:

- A northern road alignment,
- An east-west connector road that intersects with Eaton Drive, and
- A southern east-west local road located north of the proposed Public Open Space within the Parkridge site.

The road widths have been planned consistently across both developments, with the east-west connector road at 18 metres wide, and local roads at 15 metres wide.

Bushfire Management

Bushfire risk mitigation measures have been jointly considered and agreed upon by both developers.

Depending on development staging, both parties have agreed to:

- Maintain bushfire buffer areas in a low-fuel state, and
- Provide, if necessary, temporary Emergency Access routes through adjoining properties, until such time as the internal road network is fully constructed and allows for multiple points of egress.

Conclusion

Parkridge fully supports the proposed Southbank Structure Plan amendment, which provides for residential lots consistent with both the Parkridge development and the wider Eaton locality.

The integrated planning between the two developments will deliver a coordinated urban outcome, offering a diverse range of lot sizes to cater to various demographic needs within the Eaton community. This will contribute to meeting the ongoing demand for residential housing in the area.

Should any further clarification be required, please do not hesitate to contact the undersigned. We trust this submission will be duly considered during the assessment and determination of the proposed Structure Plan amendment.

Yours faithfully

Kylie Shaw
Senior Land Development Consultant
Harley Dykstra

E-mail: kylies@harleydykstra.com.au

DJS.ds 07-104310-L3001-01

26 May 2025

Attention: Chief Executive Officer
Shire of Dardanup
PO Box 7016
EATON WA 6232

via email: submissions@dardanup.wa.gov.au

Dear Sir

RE: PROPOSED AMENDMENT TO THE 'GARDEN OF EATON – SOUTHBANK@EATON' LOCAL STRUCTURE PLAN, AMENDMENT NO.2 – SUBMISSION

Ardross Estates (S.A) Pty Ltd (Ardross), is pleased to lodge the following submission regarding the proposed amendment to an approved structure plan, being the 'Garden of Eaton – Southbank@Eaton' Agreed Structure Plan 27 (ASP 27), Amendment No. 2. Our interest in this matter is as the landowner and developer of 'Southbank@Eaton', which forms part of the wider ASP 27 and MillBridge Private Estate by Ardross.

Submission

The purpose of this submission is to indicate our support of the proposed amendment and reiterate the appropriateness of the proposed modifications. We consider that the proposed land use designations, residential density code range, and modifications to the local road network will ultimately facilitate a vibrant and liveable community that is responsive to the current market, improves connectivity and protects and enhances the Kalgulup Regional Park / Collie River foreshore. The proposed amendment has been developed in collaboration with the planning consultant of the neighbouring Parkridge Estate (Harley Dykstra), who are also progressing an amendment to the approved structure plan (Amended Parkridge Estate Structure Plan). The proposed Parkridge Estate Structure Plan Amendment was open for public consultation, closing on 30 April 2025. Both proposed amendments have given careful consideration to the interface between the two developments with respect to proposed land uses, residential densities and to optimise connectivity and integration of the local movement network.

These aspects are discussed in further detail below.

Land Use and Residential Density

We consider that the proposed modifications will ultimately facilitate an active, vibrant and most importantly, sustainable community that complements the surrounding proposed development of the future Parkridge Estate and existing community of MillBridge.

The proposed amendment provides for a range of residential densities and housing opportunities that will provide a diversity of choice for future local residents in the area that is responsive to the current

market with respect to lot product type, mix and affordability informed by market feedback over recent years from MillBridge. The proposed lot types and densities will facilitate a diversity of dwelling types in line with market demand and in line with the State Government's priority to boost housing supply and affordability across the State.

Existing and planned expansion of retail and commercial offerings at Eaton Fair and Treendale are considered to provide an appropriate level of convenience and amenity to support the future local community. The removal of the additional uses (A1 & A2), which allowed for the development of up to 1200m² of commercial floorspace, has been adequately justified and supported as documented in the Needs Assessment prepared by Pracsys in support of the proposed amendment.

The proposed amendment also responds to the sensitive existing natural environment, with the preservation and celebration of the Kalgulup Regional Park, Collie River and surrounding environs as key local passive recreation areas and district attractors which will be a vital asset for the local and broader community.

Movement Network

The proposed amendments to the local movement network provides for orderly connection of local roads from Parkridge to the adjoining MillBridge Estate and to the wider road network. The Traffic Impact Assessment (TIA) prepared in support of the Proposed Amendment to ASP 27 and Conditional Subdivision Approval WAPC ref no. 201093 addresses how the subdivision of "Southbank" will integrate with the proposed movement network of the neighbouring Parkridge Estate.

The location and alignment of connection points and road reserve widths between the two estates, as proposed under the Parkridge Estate Structure Plan and ASP 27, will facilitate the integration of the movement networks. The alignment and design of the central east-west access road as a 'boulevard' type road with an 18.0m wide road reserve is supported and will provide an important connection from the estates to Eaton Drive. The northern-most and southern-most connections as depicted on the proposed ASP 27 amendment map are supported as 15.0m wide local access roads aligning with those approved under WAPC ref no. 201093 and as depicted on the proposed amendment to the Amended Parkridge Estate Structure Plan.

Bushfire Management

As part of assessing bushfire risk for the proposed amendment to ASP 27, bushfire hazards surrounding Lot 3001 located within the adjoining Parkridge Estate have been considered. Lots adjacent to the western boundary of ASP 27 within the adjacent Parkridge Estate result in temporary hazards as a result of undeveloped stages of the Parkridge Estate. Bushfire management for the development of the southern portion of "Southbank" has assumed that the POS proposed within the adjacent development (Parkridge Estate) will be unmanaged.

As confirmed in the bushfire management plan prepared, future subdivision/development of the southern portion of 'Southbank' were abutting the Parkridge Estate proposed POS is capable of achieving a BAL-29 or less through the implementation of appropriate measures such as asset protection zone (APZ) and a coordinated appropriate to bushfire management between both parties.

Ensuring that both developments have egress to multiple destinations and that temporary no through roads occur will also require coordination of bushfire management measures. Due to staging of development, temporary emergency access way(s) may be required which will need to be confirmed in consultation with the Shire and the relevant parties.

Conclusion

We wish to reiterate our support of the proposed amendment to ASP 27 and trust that the information provided within this submission will be of assistance to the Shire and WAPC in progressing the amendment. Should you wish to discuss any of the matters raised above, please do not hesitate to contact the undersigned or our planning consultant (TBB) Katherine Shirley or Samantha Thompson on 9226 4276.

Yours faithfully

Daniel Skerratt
Senior Development Manager
For: ARDROSS ESTATES (SA) PTY LIMITED ACN 007 674 080

cc: TBB, Katherine Shirley and Samantha Thompson

Suzanne Occhipinti

From: Gary & Sue Driscoll [redacted]
Sent: Wednesday, 28 May 2025 10:54 AM
To: Submissions Planning
Subject: Eaton Dve proposal

Categories: STRATEGIC

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I am writing to protest the planned new development where the existing wildlife and kangaroos are. Please consider the very few areas available to these animals and leave public space for them,
Hoping this proposal is rejected
Sue Driscoll
Dardanup ratepayer

29 May 2025

Chief Executive Officer

Shire of Dardanup

1 Council Drive, PO Box 7016

Eaton WA 6232

Dear Chief Executive Officer,

I am writing to you with regards to the Garden of Eaton – Southbank@Eaton, amendment No.2 that applies to Lot 3001 Eaton Drive, Millbridge.

This lot of land is beautiful, and always brings a smile when I drive, walk or ride past it. With gently sloped topography, distinct tree lines, and river views in the distance, along with abundant wildlife, it is a very special place.

There are few parcels of land in the area with these features, and even fewer, within the region where you can see a large family of kangaroo's, more than 100 in number, happily co-existing in a built-up residential area.

I took the opportunity to read the amendment proposal (Taylor, Burrell Barnett), including environmental considerations, made available at the shire office, and found no mention of the kangaroos, or any consideration for how they will be managed as part of the development process.

So, my questions to you are around how the kangaroos will be managed, what formal consideration has been given to them, is there a report available to the public, how will they be affected, will they be harmed, where will they reside during and after the development of this site, and if a living/grazing area been put aside for the kangaroos, will it allow for a safe existence, and will it sustain these numbers.

Based on my observations of the many people that walk past, stop and look, even take a photo of the kangaroos "living in peace" I wouldn't be the only person within the shire wondering what will happen to them.

Thank you and I look forward to hearing from you.

Kind Regards

Phil Reilly

[redacted]

Suzanne Occhipinti

From: Krish Seewraj <krish.seewraj@dwer.wa.gov.au>
Sent: Tuesday, 6 May 2025 12:32 PM
To: Submissions Planning
Cc: Andrew Coulson
Subject: RE: Shire of Dardanup - Request for Comment - Amendment to Structure Plan - Garden of Eaton - Southbank@Eaton Amendment No.2
Attachments: CM: Lot 3001 Eaton Drive Eaton LWMS

Follow Up Flag: Follow up
Flag Status: Completed

Categories: STRATEGIC

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OFFICIAL

OFFICIAL

6 May 2025
Our Reference: PA071738, DWERT50~111
Your reference: None
To: Shire of Dardanup
From: Department of Water and Environmental Regulation

RE: Amendment to Structure Plan - Garden of Eaton - Southbank@Eaton Amendment No.2

Thank you for providing the amendment to Structure Plan for Garden of Eaton for the Department of Water and Environmental Regulation (Department) to consider.

The Department in consultation with the Shire found Versions 3 Local Water Management Strategy for Lot 3001 Eaton Drive Eaton (received 06/02/22 and dated Feb 2025) met their requirements, as attached. The plans used to develop this version of the LWMS are consistent with those provided in the amendment to Structure Plan.

There are no additional water and/or environmental matters that the Department has identified for this amendment, and we therefore have no comment.

In the event there are modifications to the proposal that may have implications on aspects of environment and/or water management, the Department should be notified to enable the implications to be assessed.

Should you require any further information on the comments please contact the undersigned.

Yours sincerely,

Krish Seewraj
Planning Advice Program Manager
South West Region

Approvals – Statewide Delivery

Department of Water and Environmental Regulation
71 McCombe Road, BUNBURY, WA 6230
PO Box 261, BUNBURY, WA 6231
T: (08) 9726 4137 | F: (08) 9726 4100 | E: krish.seewraj@dwer.wa.gov.au
www.dwer.wa.gov.au | Twitter: @DWER_WA

Suzanne Occhipinti

From: Brett Coombes <Brett.Coombes@watercorporation.com.au>
Sent: Monday, 12 May 2025 11:39 AM
To: Submissions Planning
Subject: Garden of Eaton Structure plan amendment

Follow Up Flag: Follow up
Flag Status: Completed

Categories: STRATEGIC

You don't often get email from brett.coombes@watercorporation.com.au. Learn why this is important

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Attention: Suzanne Occhipinti, Senior Strategic planning Officer

Thank you for your correspondence of 17 April 2025 inviting comments on the proposed amendment to the Garden Of Eaton structure plan. The Water Corporation has no objections to the proposed layout and density changes.

If you have any further questions in this regard please contact me on Tel. 9420-3165.

Regards

Brett Coombes
Senior Planner, Land Use Planning
Development Services

The Water Corporation respects individuals' privacy. Please see our privacy notice at What about my privacy

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GOVERNMENT OF WESTERN AUSTRALIA
Department of Biodiversity, Conservation and Attractions
PARKS AND WILDLIFE SERVICE

Your ref STP-R1725855
Our ref: PRS 53912 2023-003135
Enquiries: Tracy Teede
Phone: 08 9725 4300
Email: swlanduseplanning@dbca.wa.gov.au

Chief Executive Officer
Shire of Dardanup
PO Box 7016
DARDANUP WA 6232

ATTENTION: Suzanne Occhipinti

GARDEN OF EATON SOUTHBANK AT EATON – STRUCTURE PLAN AMENDMENT 2 - LOT 3001 EATON DRIVE MILLBRIDGE

I refer to your letter dated 17 April 2025 seeking the Department of Biodiversity, Conservation and Attractions' (DBCA) comments in relation to a structure plan amendment for the above property.

The Taylor Burrell Barnett letter dated 28 February 2025 (Report) indicates that the Western Australian Planning Commission's (WAPC) subdivision application with reference 201093 represents Stage One of the proposed development. DBCA provided advice to WAPC on the 201093 subdivision application in relation to Public Open Space (POS), bushfire management, drainage and kangaroo management (attached).

DBCA provides the following advice pursuant to DBCA's responsibilities under the Biodiversity *Conservation Act 2016* (BC Act) and the *Conservation and Land Management Act 1984.*

Advice to Shire

Public Open Space
The Taylor Burrell Barnett *Garden of Eaton Agreed Structure Plan 27 Modification* (28 February 2025, Attachment A) (Plan) depicts an area of regional open space (ROS) mapped under the Greater Bunbury Region Scheme.

The ROS portion forms part of the Kalgulup Regional Park (KRP). The KRP management plan (2021) Appendix 2 indicates that the proposed KRP reserve is to be ceded to the State and vested in the Shire of Dardanup (Shire) for management purposes. DBCA has a coordination role for the KRP working with other land management agencies to achieve integrated planning and management of lands in the regional park.

Lot 9505 is adjacent to the proposed Lot 3001 ROS/KRP reserve's western boundary. Lot 9505 is to be vested in the Conservation and Parks Commission, with DBCA being the management agency. Currently, there is no suitable safe entry or access track from Eaton Drive to the proposed Lot 3001 ROS/KRP reserve or the Lot 9505 portion of the KRP, to enable bushfire, rehabilitation and other management measures such as weed control to be undertaken.

The Plan depicts an indicative pathway system within the ROS/KRP.

DBCA recommends the structure plan amendment include a provision for a reserve management plan (RMP) to be prepared, approved and implemented to the satisfaction of DBCA and the Shire of Dardanup.

The Reserve Management Plan should address:

- Provision and establishment of vehicle access within the proposed KRP reserve to a standard and location suitable for bushfire and management purposes.
- Fencing and gates to manage unauthorised motorised access and facilitate pedestrian access into the POS areas and KRP.
- Pathway design and locations.

Bushfire management

The Emerge Associates *Bushfire Management Plan* (Version A, October 2024) (BMP) executive summary refers to POS bushfire management assumptions that the site will continue to be managed in accordance with existing land management practices.

It should not be assumed that land within the KRP will be maintained as open grassland as areas may be revegetated to improve the site's ecological integrity over time. Given the KRP management plan identifies riparian areas along the Collie River and areas north of Eelup/Elbow wetland as potential candidates for rehabilitation, DBCA recommends the BMP be amended to remove assumptions about vegetation management within the KRP.

BMP Figure 4 depicts a 9-metre managed bushfire interface area adjacent to proposed residential lots, that is mainly located within the "POS and drainage" area. A small western portion of the 9-metre managed interface area is within the KRP reserve. Confirmation should be sought from the Shire, as the future land manager, that it supports ongoing management responsibilities for this managed interface area within the KRP reserve.

Drainage

The Hyd_2O *Local Water Management Strategy* (February 2025) (LWMS) Section 5.2 refers to a retaining wall on the eastern boundary of the POS directly adjacent to a freehold lot. The WAPC 201093 subdivision plan depicts a 6 metre-wide portion of POS adjacent to the eastern boundary of proposed Lot 18. Any ROS/KRP access track would need to be a sufficient width to provide access for bushfire suppression vehicles in an emergency.

The Report *Movement Network* refers to a functional movement network with the adjacent Parkridge Estate. If the proposed retaining wall encroaches into the POS, reducing the POS width at this location to not meet minimum bushfire access width requirements for bushfire suppression vehicles, then DBCA recommends suitable access be provided to the ROS/KRP via the western boundary extending the length of the western balance lot, between the proposed road reserve and POS/ROS areas to provide access to the Lot 3001 ROS/KRP and the adjacent portion of Lot 9505 ROS/KRP.

The LWMS Section 5.2 refers to outlet pipes discharging downstream from any proposed pathways within the KRP/ROS and Figure 8 depicts a biofiltration basin and storage area, with surface water flowing from the proposed development area into the adjacent ROS/KRP.

Drainage should be designed to ensure there are no nutrient, sedimentation or pollutant flows to the adjacent KRP. In addition, drainage should be designed to ensure no erosion or flooding occurs within the KRP as a result of the proposed development, particularly around access track areas.

Kangaroo management

DBCA is aware that a population of western grey kangaroos (WGK) reside in the area. No WGK survey information was provided with the application. Displaced kangaroos can create problems for nearby landowners and public open space areas, resulting in excessive grazing and safety issues particularly during summer months when food and water is scarce. The relocation of kangaroo numbers post development is very difficult.

DBCA recommends the structure plan include a provision for the local government to consider a requirement for a kangaroo management plan. If necessary, DBCA can provide advice to the proponent and the Shire of Dardanup on a range of management strategies that mitigate the impacts of kangaroo displacement.

The proponent would need to be advised that they are responsible for addressing any potential management issues related to kangaroos during development.

Thank you for the opportunity to comment on this application. Please contact Tracy Teede at the DBCA South West Region office on 9725 4300 if you have any queries regarding this advice.

Yours sincerely

Aminya Ennis
Regional Manager

26 May 2025

Att.

GOVERNMENT OF WESTERN AUSTRALIA
Department of Biodiversity, Conservation and Attractions
PARKS AND WILDLIFE SERVICE

Your ref 201093
Our ref: PRS 53262 2023-003135
Enquiries: Tracy Teede
Phone: 08 9725 4300
Email: swlanduseplanning@dbca.wa.gov.au

Western Australian Planning Commission
South West Office, Sixth Floor,
Bunbury Tower 61 Victoria Street
BUNBURY WA 6230

ATTENTION: Martin Hughes

WESTERN AUSTRALIAN PLANNING COMMISSION REF 201093 –
LOT 3001 EATON DRIVE EATON

I refer to your letter dated 2 December 2024 seeking the Department of Biodiversity, Conservation and Attractions' (DBCA) comments in relation to a subdivision application for the above property.

DBCA provides the following advice pursuant to DBCA's responsibilities under the *Biodiversity Conservation Act 2016* (BC Act) and the *Conservation and Land Management Act 1984.*

Condition
The proposed "Kalgulup Regional Park Public Open Space" shown on the approved plan of subdivision being shown on the diagram of survey (deposited plan) as a reserve for "*conservation and recreation*" and vested in the Crown under Section 152 of the Planning and Development Act 2005, such land to be ceded free of cost and without any payment of compensation by the Crown. (DBCA/Shire of Dardanup).

Condition
Prior to the commencement of subdivisional works a Reserve Management Plan is to be prepared and approved for the areas to be ceded as Kalgulup Regional Park Public Open Space reservation to ensure the protection and management of the site's values with satisfactory arrangements being made for the implementation of the approved plan in consultation with and to the satisfaction of the Department of Biodiversity, Conservation and Attractions and the Shire of Dardanup (Local Government).

Advice Note
The Reserve Management Plan is to refer to fencing, pedestrian and locked vehicle gates and the establishment of a suitable trafficable track with safe entry/exit points, for reserve, emergency and bushfire management purposes.

Advice Note
Drainage should be designed to ensure no nutrient, sedimentation, pollution, flooding or erosion impacts to the adjacent existing and proposed Kalgulup Regional Park areas.

Advice Note
The proponent would need to be advised that they are responsible for addressing any potential management issues related to kangaroos during development, on advice from the Shire of Dardanup and DBCA.

Advice to WAPC

Public Open Space
The Taylor Burrell Barnett *Plan of Subdivision – Stage 1 (Freehold*) (8 October 2024) (Plan) depicts a 5.1375 hectare lot proposed to be reserved as Public Open Space (POS), that aligns with an area of regional open space under the Greater Bunbury Region Scheme. This POS is also depicted as being part of the Kalgulup Regional Park (KRP). DBCA recommends the Plan is amended to depict the ceded KRP area as a "reserve for conservation and recreation" rather than POS to better reflect the proposed reserve purpose.

The KRP management plan (2021) Appendix 2 indicates that the proposed KRP reserve is to be ceded to the State and vested in the Shire of Dardanup (Shire) for management purposes. DBCA has a coordination role for the KRP, working with other land management agencies to achieve integrated planning and management of lands in the regional park.

Lot 9505 is adjacent to the proposed KRP reserve's western boundary that is to be vested in the Conservation and Parks Commission, with DBCA being the management agency. Currently, there is no suitable safe entry or access track from Eaton Drive to the proposed KRP reserve or the Lot 9505 portion of the KRP, to enable bushfire, rehabilitation and other management measures such as weed control to be undertaken.

The Reserve Management Plan should address:
- provision and establishment of vehicle access within the proposed KRP reserve to a standard and location suitable for bushfire and management purposes.
- fencing and gates to manage unauthorised motorised access and facilitate pedestrian access into the POS areas and KRP.

Bushfire management
The Emerge Associates *Bushfire Management Plan* (Version A, October 2024) (BMP) executive summary refers to POS bushfire management assumptions that the site will continue to be managed in accordance with existing land management practices.

It should not be assumed that land within the KRP will be maintained as open grassland as areas may be revegetated to improve the site's ecological integrity over time. Given the KRP management plan identifies riparian areas along the Collie River and areas north of Eelup/Elbow wetland as potential candidates for rehabilitation, DBCA recommends the BMP be amended to remove assumptions about vegetation management within the KRP.

BMP Figure 4 depicts a 9-metre managed bushfire interface area adjacent to proposed residential lots, that is mainly located within the "POS and drainage" area. A small western portion of the 9-metre managed interface area is within the KRP reserve. Confirmation should be sought from the Shire, as the future land manager, that it supports ongoing management responsibilities for this managed interface area within the KRP reserve.

Drainage
The Hyd_2O *Local Water Management Strategy* (November 2024) Figure 8 depicts a biofiltration basin and storage area, with surface water flows from the proposed development area into the adjacent KRP. Drainage should be designed to ensure there are no nutrient, sedimentation or pollutant flows into the adjacent KRP. In addition, drainage should be designed to ensure no erosion or flooding occurs within the KRP, particularly around access track areas.

Kangaroo management

DBCA is aware that a population of western grey kangaroos (WGK) reside in the area. No WGK survey information was provided with the application. Displaced kangaroos can create problems for nearby landowners and public open space areas, resulting in excessive grazing and safety issues particularly during summer months when food and water is scarce. The relocation of kangaroo numbers post development is very difficult.

DBCA recommends the local government consider a requirement for a kangaroo management plan. If required, DBCA can provide advice to the proponent and the Shire of Dardanup on a range of management strategies that mitigate the impacts of kangaroo displacement.

The proponent would need to be advised that they are responsible for addressing any potential management issues related to kangaroos during development.

Thank you for the opportunity to comment on this application. Please contact Tracy Teede at the DBCA South West Region office on 9725 4300 if you have any queries regarding this advice.

Yours sincerely

Aminya Ennis
Regional Manager

5 February 2025

Government of **Western Australia**
Department of **Health**

Your Ref: STP-R1725855
Our Ref: F-AA-90442-6
Contact: Vic Andrich 9222 2000

Mr André Schönfeldt
Chief Executive Officer
Shire of Dardanup
PO Box 7016
EATON WA 6232

Attention: Suzanne Occhipinti, Senior Strategic Planning Officer

Via email: submissions@dardanup.wa.gov.au

Dear Mr Schönfeldt

PROPOSED AMENDMENT TO LOCAL STRUCTURE PLAN – 'GARDEN OF EATON – SOUTHBANK@EATON' AMENDMENT No.2 – LOT 3001 EATON DRIVE, MILLBRIDGE

Thank you for your email dated 17 April 2025, requesting comment from the Department of Health (DoH) on the above proposal.

The DoH provides the following comment which is in addition to advice provided by your local environmental health services in relation to this proposal.

DoH position

☐ No objection – no comments or advice to provide.
☐ No objection – with comments and/or additional reports, studies, plans or other information that should be provided at the development application stage.
☐ No objection – with comments and/or recommended conditions and advice notes provided below.
☒ Do not support – reasons provided below.

DoH advice and recommendations

Wastewater management

No objection subject to connection to drinking water and sewage services provided by a licensed service provider.

Amenity – Medical Entomology

The proposed structure plan area is in close proximity to known mosquito breeding sites of Ross River virus (RRV) and Barmah Forest virus (BFV) vector mosquitoes and has environmental attributes conducive to mosquito breeding and the transmission of

mosquito-borne disease. The suburbs of Eaton and Millbridge adjacent to the structure plan area are identified as high-risk for mosquito-borne disease incidence. Future residents may be exposed to RRV and BFV vector mosquitoes breeding around the Collie River and other locations, as well as from stormwater drainage infrastructure within the development.

The Shire of Dardanup (the Shire) is a member of the Leschenault Mosquito Contiguous Local Authorities Group which undertakes an extensive program of health-driven mosquito monitoring and management in conjunction with the DoH. Despite considerable efforts to manage mosquitoes and mosquito-borne disease in the Shire, there continues to be a significant number of cases of RRV and BFV disease and adverse impacts on lifestyle during the spring and summer months of most years.

The subject land is approximately 14ha and is predominantly made up of Multiple Use and Floodplain Wetlands. The structure plan proposes an estimated lot yield of 120 residential lots and 140 dwellings. The Shire needs to be confident that the risk from mosquitoes and mosquito-borne diseases on public health and the severe impacts they can cause on the quality of life of residents can be adequately managed and resourced.

A Local Water Management Strategy (LWMS) has been developed for the proposal. It appears that mosquito management has not been considered as part of this strategy or within the broader structure plan application. Draft State Planning Policy 2.9 Planning for Water (a seriously entertained document as per advice from the Department of Planning, Lands and Heritage) references the following outcomes and requirements for planning proposals:

- Planning and development maintain or enhance water quality and hydrological regimes to protect public health through the appropriate siting and management of land uses.
- Identification of appropriate wetland buffers and foreshore areas to protect public health from mosquito-borne diseases.

Given the nature of the proposal and the established high risk of mosquito-borne diseases in the proposal's locality, it is recommended that the LWMS be revised prior to determination of the proposal to address the management of mosquitoes. This should include a comprehensive mosquito risk assessment and management plan for the development area incorporating the following components:

- Risk assessment for nuisance and disease-carrying mosquitoes for the locality.
- Identification of major sources (breeding sites) of mosquitoes.
- Methods and feasibility of mosquito control.
- Environmental impacts and acceptability of proposed control options.
- Cultural approaches to mosquito control.
- Identification of ongoing resource requirements of and responsibility for mosquito management and control programs and a commitment to fund these resources.

If the risk assessment indicates that nuisance and disease-carrying mosquitoes will impact substantially on future developments, and feasibility studies indicate that the problem will be difficult to manage and/or there are insufficient resources available ongoingly to undertake effective mosquito management, it is recommended that the proposal does not proceed.

The LWMS proposes the use of biofiltration systems and ephemeral detention areas in Public Open Space areas as part of its stormwater management. The design infiltration rate is not clear. Drainage should be designed to a 96-hour infiltration rate to minimise mosquito breeding. A monitoring and maintenance schedule is proposed for the stormwater management systems. Responsibility and ongoing resourcing requirements and commitments for this schedule should be clearly defined as part of the mosquito management plan.

Should the application be approved, the DoH recommends that:

a. The proponent works with the Shire of Dardanup to ensure effective mosquito management is further developed and adequately funded for the locality.

b. The Shire of Dardanup ensures they have sufficient resources to continue mosquito management for the future of the development following the handover of responsibility from the developer.

c. Property owners be warned of the risk of mosquito-borne disease and the potential for nuisance mosquitoes via an appropriately worded notification on any newly created property titles.

d. Public open space with limited vegetation should be located between the mosquito breeding sites and residential areas to create an area that is refractory to mosquito dispersal, thereby reducing the number of mosquitoes impacting residents.

e. Built form design measures for dwellings (insect screening on doors and windows and screened outdoor enclosures), public education packages and public signage are included as part of the conditions of approval.

f. The proponent develops an integrated mosquito management plan to manage mosquitoes and other nuisance insects to reduce the risk of exposure for residents. This plan shall be required to be endorsed by the Shire of Dardanup as a condition of approval. The plan shall comprise, but not necessarily be limited to, the following:
    i. Appropriate location, design and maintenance of project infrastructure to prevent mosquito breeding (e.g. wastewater, stormwater infrastructure).
    ii. Source reduction (removal or modification of mosquito breeding habitat).
    iii. Monitoring of larval and adult mosquitoes in and around the proposed infrastructure to inform the location and timing of control measures.
    iv. Control (chemical, physical, biological and/or cultural) of larval and adult mosquitoes in artificial and natural breeding sites close to residents.

v. Ensuring mosquito management strategies comply with all Federal and State legislative requirements.
vi. Identification of ongoing resource requirements of and responsibility for mosquito management and control programs and a commitment to fund these resources.
vii. Further information on mosquito management and mosquito management plans can be found here: Mosquito management (health.wa.gov.au).

Flood risk mitigation

The proposed lots are to be constructed along the top of a raised escarpment immediately adjacent to the Collie River flood plain.

Groundwater is less than 1m below the existing surface and there is evidence of ephemeral waterways and wetlands within the site. A 2004 flood assessment indicated that although much of the site is above the 1 in 100-year flood plain risk, there is a floodway passing through the site which should not be obstructed. Acid sulfate soils lie less than 3m below the existing surface.

The proponent is required to develop a site-specific Disaster Management and Emergency Response Plan (DMERP) to manage potential flood risk. The DMERP should be consistent with the Shire of Dardanup Disaster Management and Recovery Plan.

The proponent intends to raise land levels across the whole subdivision to maintain a 3m vertical separation from underlying groundwater and acid sulfate soils through the widespread importation of clean sand fill. Any fill imported onto the site should be certified clean fill from a named quarry source.

Contaminated sites

The site has not been classified as 'contaminated – remediation required', 'contaminated – restricted use', or 'remediated for restricted use' as recorded on the Department of Water and Environmental Regulation's (DWER) Contaminated Sites database (*Contaminated Sites Act 2003*). Whilst this site does not appear on DWER's public access database, it may be subject to other important classifications not recorded on the database. The proponent should obtain a Basic Summary of Records relating to the land and its surroundings to complete their assessment of the site's suitability for a rezoning to a more sensitive land use.

Requested further information and/or revised plans

1. Revised Local Water Management Strategy to include a comprehensive mosquito risk assessment and mosquito management plan for the development area.
2. Develop a site-specific Disaster Management and Emergency Response Plan (DMERP) to manage potential flood risk.

Recommended further information and/or revised plans

1. Obtain a Basic Summary of Records of the subject area.

Should you have any queries or require further information, please contact System Performance on 9222 2000 or eh.eSubmissions@health.wa.gov.au.

Yours sincerely

Matthew Lester
A/EXECUTIVE DIRECTOR
ENVIRONMENTAL HEALTH DIRECTORATE

21 May 2025

GOVERNMENT OF WESTERN AUSTRALIA

DFES Department of Fire & Emergency Services

Our Ref: D38781
Your Ref: Structure Plan

Suzanne Occhipinti
Shire of Dardanup
suzanne.occhipinti@dardanup.wa.gov.au

Dear Ms Occhipinti

RE: LOT 3001 EATON DRIVE, MILLBRIDGE – PROPOSED AMENDMENT NO.2 TO THE GARDEN OF EATON – SOUTHBANK STRUCTURE PLAN

I refer to your email dated 22 April 2025 regarding the submission of a Bushfire Management Plan (BMP) (Version A), prepared by Emerge Associates and dated October 2024, for the above proposed local structure plan (LSP) amendment.

This advice relates to the *State Planning Policy 3.7 Bushfire* (SPP 3.7) and supporting *Planning for Bushfire Guidelines* (Guidelines), as well as DFES' role and responsibilities as Hazard Management Agency for Fire in Western Australia.

General Comment

- DFES acknowledges that the proposal seeks to modify the densities and layout of the approved LSP.
- It is noted that the BMP has been prepared in accordance with the 2015 State Planning Policy 3.7 Planning in Bushfire Prone Areas framework. Applications lodged on or after 18 November 2024 should be assessed under the current SPP 3.7 and associated Guidelines, and DFES has undertaken an assessment of the BMP accordingly.
- Specific requirements of SPP 3.7 and the Guidelines are to be further addressed in the BMP as outlined in the below assessment Tables 1 - 3.

Recommendation: Compliance with acceptable solutions not demonstrated – modifications required

DFES advises that the BMP has not demonstrated that the proposed development complies with the following requirements of SPP 3.7 and the Guidelines:
1. Element 2: Siting and Design; and
2. Element 3: Vehicular Access.

DFES recommends the BMP be modified as per the Assessment advice provided in Tables 1-3 to ensure it is accurate and the bushfire risk management/mitigation measures are effective and can be implemented in perpetuity to manage/mitigate the bushfire risk to people, property and infrastructure to an acceptable level and appropriate to the land use and location. The required modifications are listed in the table(s) below. Should the modified BMP affect the design of the proposal, the proposal should be amended to reflect these modifications.

Could you please forward notification of the application determination to DFES for our records.

If you require any clarification or further information regarding the below assessment, please do not hesitate to contact me on telephone number 9395 9702.

Yours sincerely

Sean He
SENIOR LAND USE PLANNING OFFICER

27 May 2025

Table 1 – Assessment – Policy Measure 7.1 ii. c. Compliant Preparation of a BAL Contour Map

Vegetation Classification or Exclusions	BMP Modification Required
Classified Plot 5 – not demonstrated A significant portion of vegetation Plot 5 is within a Regional Open Space (ROS) area and the BMP assumes that vegetation within this area will be retained with no ongoing management required for bushfire management purpose. As the area abuts the Collie River foreshore and has previously been cleared, without an ongoing management mechanism, it is unclear whether the potential for revegetation has been considered. If unsubstantiated, the vegetation classification should be revised to consider the vegetation at maturity as per AS3959, or the resultant BAL ratings may be inaccurate.	**BAL Rating cannot be validated** Further evidence to support the proposed vegetation management of Plot 5 is required. Should no further evidence be provided Plot 5 should be revised as per AS3959.

Table 2 - Policy Measure 7.1 ii. e. Compliance with the Bushfire Protection Criteria 5: Structure plans and subdivision applications

Element	Assessment	Action
Siting and Design – Asset Protection Zone (APZ)	**A2.2 – not demonstrated** The BAL ratings cannot be validated for the reason(s) outlined in Table 1. Furthermore, Lots 1 -7 of the proposed 'Stage 1' subdivision, Lot 1 of the proposed 'Stage 2' subdivision and the 'grouped housing site' are affected by BAL-FZ and/or BAL-40, due to the 'temporary hazards' from the adjoining Parkridge Estate to the west. While the BMP states that the relevant bushfire risk can be managed through either in-lot setbacks or staging of the development, Figure 4 of the BMP has not demonstrated that an indicative BAL-29 APZ can be achieved for the 'Stage 1' and 'Stage 2' subdivision lots, if the 'temporary hazards' are not removed. In accordance with Section 5.4 of the Guidelines, a condition should be included on the relevant subdivision approval stating that *Each lot shall include a development site of BAL-29 or below, to the satisfaction of the WAPC.* Alternatively, the affected proposed lots should be created as a single balance lot, until the bushfire hazard on the adjoining Parkridge Estate stie is removed. The implementation section of the BMP should be modified accordingly.	**BAL Rating cannot be validated** Modification to the BMP is required to address the Assessment advice.

Vehicular Access – Access Routes and No-through Roads	**A3.2, A3.3a and A 3.4 – not demonstrated** The LSP amendment plan shows four no-through roads along the western site boundary and relies on the construction of the subdivision roads of the adjoining Parkridge Estate to achieve multiple access routes. This is not considered compliant with Section 5.4 of the Guidelines which requires at least two access routes to be achieved at each stage of subdivision. Alternatively, the affected lots may be created as a single balance lot until compliant access is provided and the adjoining classified vegetation is removed or appropriately modified. DFES acknowledges that the BMP proposes a potential temporary Emergency Access Way (EAW) between the subject site and Eaton Drive until road connections to the west are available. However, an EAW is not a preferred alternative to public road access and should only be considered where it is demonstrated that A3.2 and A3.3 cannot be achieved due to site constraints. Considering the size of the subject site, there appears to be no constraints restricting full compliance with A3.2.	**Compliance with Vehicular Access not demonstrated** Modification to the BMP is required to address the Assessment advice.
Vehicular Access – Perimeter Roads and Fire Service Access Route (FSAR)	**A3.5a and A3.5b – not demonstrated** As the subject site abuts classifiable vegetation and the LSP amendment proposes to create more than 10 lots, perimeter roads are required in accordance with A3.5a. Perimeter roads may function to provide both hazard separation and unconstrained public access/egress in the event of a bushfire. DFES recommends that the LSP amendment proposal consider the use of perimeter roads to achieve compliance with the acceptable solutions. DFES also recommends the LSP design consider replacing the 21-metre APZ on the ‘grouped housing site’ with a public road, which is considered to improve compliance with A3.2 and A 3.5a.	**Compliance with Vehicular Access not demonstrated** Modification to the BMP is required to address the Assessment advice.

Table 3: Policy Measure 7.1 iv. and Section 9.4.2 of the Guidelines: DFES Role as Hazard Management Agency (HMA)

DFES wishes to provide the below additional advice in its role and responsibilities of HMA for Fire in Western Australia.

DFES Other Technical Advice		Action
DFES Land Use Planning	It is the responsibility of the proponent to ensure the proposal complies with relevant planning and building requirements. This advice does not exempt the applicant/proponent from obtaining approvals that apply to the proposal including planning, building, environmental health or any other approvals required by a relevant authority under written laws.	Comment only.

PUBLIC SUBMISSIONS & AGENCY REFERRALS – APPLICANT RESPONSE

Subject	Public Submissions & Agency Referrals – Applicant Response
Date	11 June 2025
Reference	17~079a Amendment No. 2 Garden of Eaton – Southbank@eaton LSP (ASP 27)
To	Shire of Dardanup
From	Taylor Burrell Barnett

Support
Comment
Objection

The 'Applicant Response' is provided in relation to submissions received from the public advertising period and agency referrals in response to Amendment No. 2 Garden of Eaton – Southbank@eaton LSP (ASP 27).

As noted under the 'Applicant Response', the majority of the comments received from agencies have been appropriately addressed and supported through the granting of subdivision approval for appropriately 100 single residential lots under WAPC ref no. 201093 (approved 14 March 2025) and supported by the relevant technical assessments in the approved Local Water Management Strategy (LWMS) and Bushfire Management Plan (BMP).

Further, the subdivision design across the majority of the ASP 27 area was considered by the Shire and WAPC to be generally in alignment with the approved layout and does not fundamentally alter the original purpose and intent of ASP 27, which was upheld through the approval of WAPC ref no. 201093. The main purpose of the amendment request is to remove the additional use(s) and modify the density code within the northern portion of the ASP 27 area. The land use designations and residential density of the existing ASP 27 is generally in keeping with the subdivision and development intent as envisaged under the approved ASP 27 and the existence of this approved planning framework should be acknowledged.

Ref	Submitter/Agency	Summary of Submission	Applicant Response
1	Harley Dykstra on behalf of Parkridge Pty Ltd	• The amended Structure Plan provides for an integrated local road network that connects the Parkridge and Southbank sites, while also considering the wider road network context. • Bushfire risk mitigation measures have been jointly considered and agreed upon by both developers. • The integrated planning between the two developments will deliver a coordinated urban outcome, offering a diverse range of lot sizes to cater to various demographic needs within the Eaton community. This will contribute to meeting the ongoing demand for residential housing in the area.	N/A.
2	Ardross Estates	• The proposed land use designations, residential density code range, and modifications to the local road network will ultimately facilitate a vibrant and liveable community that is responsive to the current market, improves connectivity and protects and enhances the Kalgulup Regional Park / Collie River foreshore. • The proposed amendment has been developed in collaboration with the planning consultant of the neighbouring Parkridge Estate (Harley Dykstra), who are also progressing an amendment to the approved structure plan (Amended Parkridge Estate Structure Plan). Both proposed amendments have given careful consideration to the interface between the two developments with respect to proposed land uses, residential densities and to optimise connectivity and integration of the local movement network.	N/A.
3	Sue Driscoll	The planned development will have an impact on existing wildlife and kangaroos.	As required by Condition 6 of Conditional Subdivision Approval WAPC ref no. 201093 approved by the WAPC for the amendment area on 14 March 2025, a Reserve Management is to be approved prior to the commencement of subdivision works ensure the protection and management of the site's values. The management plan will be prepared in consultation with, and to the satisfaction of, DBCA and the Shire. The management plan will outline measures and responsibilities for addressing kangaroos during development, on advice from the Shire of Dardanup and DBCA.

Ref	Submitter/Agency	Summary of Submission	Applicant Response
4	Phil Reilly	• Amendment proposal lacks information on the impact on kangaroos and how they will be managed as part of the development process and what formal consideration has been given to them. • Specifically, how will they be affected, will they be harmed, where will they reside during and after the development of this site, and if a living/grazing area been put aside for the kangaroos, will it allow for a safe existence, and will it sustain these numbers.	Refer response at (3) above.
5	Department of Water and Environmental Regulation (DWER)	• The Department in consultation with the Shire found Versions 3 Local Water Management Strategy for Lot 3001 Eaton Drive Eaton (received 06/02/22 and dated Feb 2025) met their requirements. • There are no additional water and/or environmental matters that the Department has identified for this amendment, and we therefore have no comment.	N/A.
6	Water Corporation	The Water Corporation has no objections to the proposed layout and density changes.	N/A.
7	Department of Biodiversity, Conservation and Attractions (DBCA)	<u>Public Open Space</u> • Currently, there is no suitable safe entry or access track from Eaton Drive to the proposed Lot 3001 ROS/KRP reserve or the Lot 9505 portion of the KRP (to be vested with the Conservation and Parks Commission (DBCA management agency), to enable bushfire, rehabilitation and other management measures such as weed control to be undertaken. The Plan depicts an indicative pathway system within the ROS/KRP. • DBCA recommends the structure plan amendment include a provision for a reserve management plan (RMP) to be prepared, approved and implemented to the satisfaction of DBCA and the Shire of Dardanup. The Reserve Management Plan should address:	• In accordance with the Structure Plan map, a universally accessible dual-use path will be provided ensuring good pedestrian/cyclist connectivity along the foreshore and beyond, including in a westerly direction to connect with Lot 9505. The design interface with the foreshore will be generally consistent with the remainder of the foreshore (i.e. no fencing). Consistent with Advice Note 4 of WAPC ref no. 201093, the RMP required as a condition of subdivision will need to address relevant matters such as fencing and pedestrian/cyclist/emergency vehicle access. This will be developed in consultation with, and to the satisfaction of, DBCA and the Shire, with the Shire as the approval agency. • Refer response at (3) above.

Ref	Submitter/Agency	Summary of Submission	Applicant Response
		o Provision and establishment of vehicle access within the proposed Kalgulup Regional Park (KRP) reserve to a standard and location suitable for bushfire and management purposes. o Fencing and gates to manage unauthorised motorised access and facilitate pedestrian access into the POS areas and KRP. o Pathway design and locations.	
		<u>Bushfire Management</u> • It should not be assumed that land within the KRP will be maintained as open grassland as areas may be revegetated to improve the site's ecological integrity over time. DBCA recommends the BMP be amended to remove assumptions about vegetation management within the KRP. • A small western portion of the 9-metre managed interface area is within the KRP reserve. Confirmation should be sought from the Shire, as the future land manager, that it supports ongoing management responsibilities for this managed interface area within the KRP reserve.	• The Shire have indicated they understand they will be responsible for long term management of the KRP/ROS based on the classification as documented in the BMP supported under WAPC ref no. 201093 (i.e. managed to low threat). The abutting vegetation classification will remain as grassland and based on the area that will remain as 'grassland' a 9m wide low threat managed area will be required to enable habitable buildings to be achieve BAL-29. The current assumptions in the BMP are understood and supported by the Shire as the future land manager documented in the Kalgulup Regional Open Space Management Plan. Further discussions with the Shire/DBCA will occur through preparation and approval of the Reserve Management Plan as a condition of subdivision and BALs confirmed at the subsequent planning (BL) stage. • It is acknowledged that a sliver of land along the western boundary is reserved as 'Regional Open Space' under the GBRS and Shire's TPS 3. It has been confirmed with the Shire (email dated 31 March 2025), that the proposed Amendment and approved subdivision is consistent with the 'residential' land use designated under the approved ASP 27. The Shire confirmed they may progress an omnibus amendment to include alignment with the GBRS once LPS9 is gazetted and will continue to assess the Structure Plan amendment on the basis that the lot boundaries generally align with the existing R100 boundaries at the north-eastern edge.
		<u>Drainage</u> • A 6m-wide POS (with retaining wall along the eastern boundary) is proposed adjacent the eastern boundary of	• As documented in the BMP, no fire service access route is proposed or required to achieve compliance as the permanent bushfire hazard to the north is classified grassland vegetation. Further, a dual-use footpath

Ref	Submitter/Agency	Summary of Submission	Applicant Response
		proposed Lot 18 which would need to be a sufficient width to provide access for bushfire suppression vehicles in an emergency. DBCA recommends suitable access be provided to the ROS/KRP via the western boundary extending the length of the western balance lot, between the proposed road reserve and POS/ROS areas to provide access to the Lot 3001 ROS/KRP and the adjacent portion of Lot 9505 ROS/KRP. • Drainage should be designed to ensure there are no nutrient, sedimentation or pollutant flows to the adjacent KRP. In addition, drainage should be designed to ensure no erosion or flooding occurs within the KRP as a result of the proposed development, particularly around access track areas.	will be provided in consultation with the Shire of Dardanup/DBCA. Refer Response at '7 - Public Open Space' above. This dual-use footpath can provide for vehicle access if required. • Consistent with Advice Note 5 of WAPC ref no. 201093, drainage proposed within the public open space area will need to be designed to ensure no nutrient, sedimentation, pollution, flooding or erosion impacts to the adjacent KRP. This is consistent with the principles of the LWMS (as approved).
		<u>Kangaroo Management</u> • DBCA recommends the structure plan include a provision for the local government to consider a requirement for a kangaroo management plan.	Refer response at (3) above. Noting comments from DBCA that advice can be provided to the proponent and the Shire on a range of management strategies that mitigate the impacts of kangaroo displacement.
8	Department of Health (DoH)	<u>Wastewater management</u> • No objection subject to connection to drinking water and sewage services provided by a licensed service provider.	Noted - the development will be connected to drinking water and sewage services provided by a licensed service provider.
		<u>Amenity – Medical Entomology</u> • The proposed structure plan area is in close proximity to known mosquito breeding sites of Ross River virus (RRV) and Barmah Forest virus (BFV) vector mosquitoes and has environmental attributes conducive to mosquito breeding and the transmission of mosquito-borne disease. • It is recommended that the LWMS be revised prior to determination of the proposal to address the management of mosquitoes. • The DoH recommends that: • The proponent works with the Shire of Dardanup to ensure effective mosquito management is further developed and adequately funded for the locality.	As required by Condition 8 of Conditional Subdivision Approval WAPC ref no. 201093 approved by the WAPC for the amendment area on 14 March 2025, notification on titles is required advising of the existence of mosquito breeding areas. This was applied as a condition of subdivision by the WAPC on the advice of the DoH.

Ref	Submitter/Agency	Summary of Submission	Applicant Response
		• The Shire of Dardanup ensures they have sufficient resources to continue mosquito management for the future of the development following the handover of responsibility from the developer. • Property owners be warned of the risk of mosquito-borne disease and the potential for nuisance mosquitoes via an appropriately worded notification on any newly created property titles. • Public open space with limited vegetation should be located between the mosquito breeding sites and residential areas to create an area that is refractory to mosquito dispersal, thereby reducing the number of mosquitoes impacting residents. • Built form design measures for dwellings (insect screening on doors and windows and screened outdoor enclosures), public education packages and public signage are included as part of the conditions of approval. • The proponent develops an integrated mosquito management plan to manage mosquitoes and other nuisance insects to reduce the risk of exposure for residents. This plan shall be required to be endorsed by the Shire of Dardanup as a condition of approval. The plan shall comprise, but not necessarily be limited to, the following: o Appropriate location, design and maintenance of project infrastructure to prevent mosquito breeding (e.g. wastewater, stormwater infrastructure). o Source reduction (removal or modification of mosquito breeding habitat). o Monitoring of larval and adult mosquitoes in and around the proposed infrastructure to inform the location and timing of control measures.	

Ref	Submitter/Agency	Summary of Submission	Applicant Response
		o Control (chemical, physical, biological and/or cultural) of larval and adult mosquitoes in artificial and natural breeding sites close to residents. o Ensuring mosquito management strategies comply with all Federal and State legislative requirements. o Identification of ongoing resource requirements of and responsibility for mosquito management and control programs and a commitment to fund these resources. o Further information on mosquito management and mosquito management plans can be found here: Mosquito management (health.wa.gov.au).	
		<u>Flood risk mitigation</u> • A 2004 flood assessment indicated that although much of the site is above the 1 in 100-year flood plain risk, there is a floodway passing through the site which should not be obstructed. • Acid sulfate soils (ASS) lie less than 3m below the existing surface. • Any fill imported onto the site should be certified clean fill from a named quarry source. • The proponent is required to develop a site-specific Disaster Management and Emergency Response Plan (DMERP) to manage potential flood risk. The DMERP should be consistent with the Shire of Dardanup Disaster Management and Recovery Plan.	As noted in the approved LWMS, a small portion of the site is located within the flood fringe of the Collie River (Figure 6 of approved LWMS). Filling of the flood fringe is permitted and does not preclude development and has been account for in modelling the site as detailed in Section 6 of the LWMS. As noted in the DoH comments, development within the flood fringe is note precluded. The DoH comments relate to the use of clean sand fill. As documented in the Geotech report appended to the approved LWMS, the majority of the site would be classified Class "S to M" with the exception of a small area of natural sand within the south western corner of the site which can achieve Class "A". The remainder of the site can be upgraded to Class "S.
		<u>Contaminated sites</u> • The proponent should obtain a Basic Summary of Records (BSR) relating to the land and its surroundings to complete their assessment of the site's suitability for a rezoning to a more sensitive land use.	The Amendment does not propose to introduce any additional 'sensitive' land uses than that already approved under the existing ASP 27. The Amendment proposes to modify the land use / density layout and remove the Additional Use that permits short stay residential and commercial floorspace on sites designated as 'Residential' under the existing ASP 27. Furthermore, subdivision approval has been granted for the majority of the Amendment area under WAPC ref no. 201093 and considered suitable for

Ref	Submitter/Agency	Summary of Submission	Applicant Response
			residential development. As noted by DoH, the site has not been classified as 'contaminated – remediation required', 'contaminated – restricted use', or 'remediated for restricted use' as recorded on the Department of Water and Environmental Regulation's (DWER) Contaminated Sites database (Contaminated Sites Act 2003). The nearest registered site which is classified as 'contaminated – remediation required' is located 1km to the west of the Amendment area and on the opposite side of the Collie River.
9	Department of Fire & Emergency Services (DFES)	<u>Vegetation Classification or Exclusions</u> • A significant portion of vegetation Plot 5 is within a Regional Open Space (ROS) area and the BMP assumes that vegetation within this area will be retained with no ongoing management required for bushfire management purposes. • Further evidence to support the proposed vegetation management of Plot 5 is required. Should no further evidence be provided Plot 5 should be revised as per AS3959.	No management of Plot 5 is proposed consistent with the position agreed with the Shire as the agency responsible for long term management of the ROS. This area is existing paddock areas, where the grass is kept low in height and would be more akin to 'low threat' than grassland. The areas identified as grassland, particularly those associated with the ROS, have been cleared paddock areas since at least the 1970s (based on publicly available aerial photography) with so substantial change in vegetation cover over that time period (at least 50 years) e.g. not new tree or other vegetation growth. Active grazing by herbivores, including kangaroos, is in effect, hence the low grass height. Kangaroos will still be present in the area following development. No change to the classification is proposed. Photographs have been providing showing the current state of the regional open space, and more photos can be provided if requested. It is unclear what other 'evidence' is required, particularly when no ongoing management is assumed.
		<u>Siting and Design – Asset Protection Zone (APZ)</u> • The BAL ratings cannot be validated for the reason(s) outlined above (Plot 5). • Proposed lots are affected by BAL-FZ and/or BAL-40, due to the 'temporary hazards' from the adjoining Parkridge Estate. Figure 4 of the BMP has not demonstrated that an indicative	As required by Conditions 23 & 24 of Conditional Subdivision Approval WAPC ref no. 201093 approved by the WAPC for the amendment area on 14 March 2025, implementation of the measures contained in the BMP are required, in addition to notification on titles advising the land is located within a bushfire prone area.

Ref	Submitter/Agency	Summary of Submission	Applicant Response
		BAL-29 APZ can be achieved if the 'temporary hazards' are not removed. • A condition should be included on the relevant subdivision approval stating that *Each lot shall include a development site of BAL- 29 or below, to the satisfaction of the WAPC.*	Bushfire risk mitigation measures have been jointly considered and agreed upon by both developers for the site and Parkridge Estate, including maintaining a low threat (bushfire buffer) area adjacent to lots being titled where development has not progressed. This is in acknowledgement that vegetation in either landholding could result in temporary BAL impacts that will not be present long-term. This was agreed and understood as part of the approved subdivision for the site. Lots will not be titled until a suitable area for habitable buildings to achieve BAL-29 is available. Coordinated management against bushfire risk will occur with the neighbouring developer of Parkridge Estate to ensure that all new habitable buildings are capable of achieving a BAL-29.
		<u>Vehicular Access – Access Routes and No-through Roads</u> • The LSP amendment plan shows four non-through roads along the western site boundary and relies on the construction of the subdivision roads of the adjoining Parkridge Estate to achieve multiple access routes. This is not considered compliant with Section 5.4 of the Guidelines which requires at least two access routes. • DFES acknowledges that the BMP proposes a potential temporary Emergency Access Way (EAW) between the subject site and Eaton Drive until road connections to the west are available. However, an EAW is not a preferred alternative to public road access and should only be considered where it is demonstrated that A3.2 and A3.3 cannot be achieved due to site constraints. Considering the size of the subject site, there appears to be no constraints restricting full compliance with A3.2.	As demonstrated in the BMP, the road network proposed will provide connections to two access/egress points. However, acknowledging that due to the staging of development within Parkridge Estate, it is possible that only a single access is provided to Eaton Drive in the short-term. If required, a temporary emergency accessway can be provided from the site to Eaton Drive until development to the west has progressed and road connections are available. Two possible locations have been identified in the BMP and a specific location will be confirmed in consultation with the Shire of Dardanup. This approach has been supported by the Shire and WAPC through the approval of Conditional Subdivision Approval WAPC ref no. 201093. As part of assessing bushfire risk for the proposed amendment to ASP 27, bushfire hazards surrounding Lot 3001 located within the adjoining Parkridge Estate have been considered. Bushfire risk mitigation measures have been jointly considered and agreed upon by both developers. Depending on development staging, both parties have agreed to: • Maintain bushfire buffer areas in a low-fuel state, and • Provide, if necessary, temporary EAW routes through adjoining properties, until such time as the internal road network is fully constructed and allows for multiple points of egress.

Ref	Submitter/Agency	Summary of Submission	Applicant Response
		Vehicular Access – Perimeter Roads and Fire Service Access Route (FSAR) • As the subject site abuts classifiable vegetation and the LSP amendment proposes to create more than 10 lots, perimeter roads are required in accordance with A3.5a. • DFES recommends that the LSP amendment proposal consider the use of perimeter roads to achieve compliance with the acceptable solutions. • DFES also recommends the LSP design consider replacing the 21m APZ on the 'grouped housing site' with a public road, which is considered to improve compliance with A3.2 and A3.5a.	As documented in the BMP supported by the Shire and WAPC through the approval of Conditional Subdivision Approval WAPC ref no. 201093, under the Guidelines, a perimeter road is not required where lots interface within grassland vegetation. Vegetation to the west is a temporary hazard and as the road connections are in accordance with the approved structure plans, no perimeter access is proposed. Lots on the west will connect to other residential areas. As confirmed in the BMP, future subdivision/development of the southern portion of the site where abutting the Parkridge Estate proposed POS is capable of achieving a BAL-29 or less through the implementation of appropriate measures such as asset protection zone (APZ) and a coordinated approach to bushfire management between both parties.

(Appendix ORD: 12.2.3D)

RISK ASSESSMENT TOOL

OVERALL RISK EVENT: Amendment #2 to Garden of Eaton Local Structure Plan (Southbank@Eaton Area)

RISK THEME PROFILE:

7 - Environment Management

RISK ASSESSMENT CONTEXT: Operational

CONSEQUENCE CATEGORY	RISK EVENT	PRIOR TO TREATMENT OR CONTROL			RISK ACTION PLAN (Treatment or controls proposed)	AFTER TREATEMENT OR CONTROL		
		CONSEQUENCE	LIKELIHOOD	INHERENT RISK RATING		CONSEQUENCE	LIKELIHOOD	RESIDUAL RISK RATING
HEALTH	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
FINANCIAL IMPACT	Without amendments being recommended on the structure plan as part of this process, the requirements at subdivision stage hold less weight as an overall requirement to manage risk associated with mosquitos and associated impacts with displacing kangaroos.	Minor (2).	Unlikely (2)	Low (1 - 4)	Not required.	Not required.	Not required.	Not required.
SERVICE INTERRUPTION	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
LEGAL AND COMPLIANCE	No risk event identified for this category.	Not required	Not required	Not required	Not required.	Not required.	Not required.	Not required.
REPUTATIONAL	If Council does not undertake annual updates to the DCP in an open an transparent manner it undermines the DCP framework.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
ENVIRONMENT	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.	Not required.
PROPERTY	No risk event identified for this category.	Not required.	Not required.	Not required.	Not required	Not required.	Not required.	Not required.

(Appendix ORD: 12.2.3E)

Engineering a better future for over 20 years!

Lot 3001 Eaton Drive, Eaton

Proposed Subdivision

Revised Transport Impact Assessment

PREPARED FOR:
Ardross Eatates (S.A.) Pty Ltd

June 2025

Document history and status

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Client: Ardross Estate (S.A.) Pty Ltd

Project: Lot 3001 Eaton Drive, Eaton

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1 Summary

This Traffic Impact Assessment (TIA) has been prepared by Transcore on behalf of Ardross Estates (S.A.) Pty Ltd for the proposed revised subdivision at Lot 3001 Eaton Drive, known as Southbank, located in the Shire of Dardanup.

Transcore initially prepared a Traffic Impact Assessment (TIA) in July 2024 for the original subdivision, which received approval in March 2025 (WAPC ref no. 201093). Recently, Taylor Burrell Barnett (TBB) developed a revised subdivision plan that introduces minor amendments, including three connection points to the Parkridge Estate and an additional 28 lots within the revised subdivision.

The revised subdivision plan is designed to accommodate both scenarios—the approved and the proposed Parkridge Estate Structure Plan—demonstrating that the movement network for "Southbank" can function effectively under either condition. If Amendment 1 is approved, the revised plan will remain suitable and efficient. However, if Amendment 1 is not approved, the original approved subdivision road network will need to be implemented, which will require minor adjustments to revert the revised subdivision back to the original design.

Updated transport modelling and analysis undertaken in this Revised TIA indicates that the proposed minor amendments to the approved subdivision plan would not change the outcome of the assessments undertaken in the original TIA for the approved subdivision.

2 Introduction and Background

This Revised Traffic Impact Assessment (TIA) has been prepared by Transcore on behalf of Ardross Estates (S.A.) Pty Ltd for the revised subdivision at Lot 3001 Eaton Drive, known as Southbank, located in the Shire of Dardanup.

Transcore originally prepared a TIA in July 2024 for a the original subdivision. The original subdivision was approved in March 2025 (WAPC ref no. 201093). Taylor Burrell Barnett (TBB) has recently prepared a revised subdivision plan with following minor amendements to the approved subdivision plan:

- It shows 3 connection points to the Parkridge Estate;
- It will have 28 more Lots;

The road network in the revised subdivision plan is designed to integrate with the road layout proposed in Amendment 1 to the Parkridge Estate Structure Plan. Therefore, if Amendment 1 is approved, the revised subdivision plan for Southbank will continue to be suitable and function efficiently. However, if Amendment 1 is not approved, the original approved subdivision road network will need to be implemented, which will require minor adjustments to revert the revised subdivision back to the original approved plan.

Consequently, this Revised TIA has been prepared to reflect the revised subdivision plan and to evaluate the traffic impact associated with the increased number of lots and changes to the road layout of the subdivision plan.

The Southbank forms the northwestern corner of the Garden of Eaton Local Structure Plan (LSP), which was endorsed in July 2014. The Garden of Eaton LSP is situated in the suburbs of Millbridge and Eaton within the Greater Bunbury region. The endorsed LSP is provided in **Appendix A**.

Immediately adjacent to the west of Southbank development is the Parkridge Estate.The original structure plan for Parkridge Estate was approved in 2019. Since then, the development of 71 lots located on the southern end of the Parkridge structure plan has been completed. The approved Parkridge Estate Structure Plan is included in **Appendix B**. However, a recent amendment to the Parkridge Estate Structure Plan, proposed in 2023, was refused by the DPLH's Statutory Planning Committee in April 2024. The amended Parkridge Estate Structure Plan is included in **Appendix C**.

The proposed Southbank is located in Eaton, Shire of Dardanup. It is located approximately 9km northeast of Bunbury, and about 150km south of Perth.The location of the Southbank and Parkridge Estate is illustrated in **Figure 1**. The traffic modelling and analysis undertaken in this Revised TIA considers the full development of both Estates and the potential traffic interaction between them.

For the purpose of this Revised TIA the following documents were sourced and reviewed:

- Southbank at Eaton East Millbridge Amended Structure Plan, MGA town planners 2015;
- Parkridge SP, Calibre Professional Services Pty Ltd, September 2019;
- Eaton Drive Access Review, Riley Consulting, April 2018; and,
- Parkridge SP Modifications TIA, Stantec, March 2023 and January 2025.

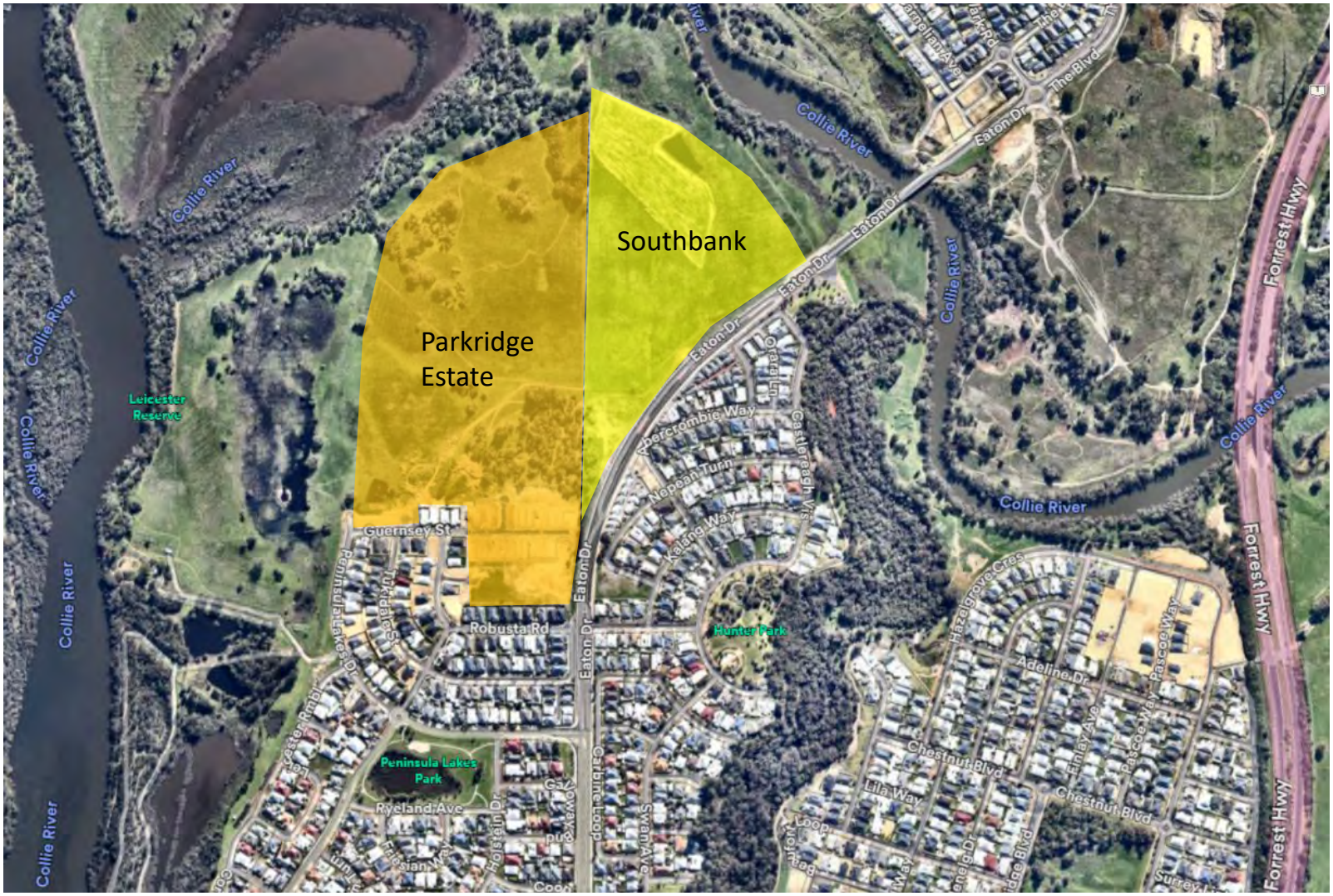

Figure 1: Location of the Southbank and Parkridge Estates

3 Proposed Revised Subdivision

The proposed plan of the revised subdivision is shown in **Appendix D**. The plan of subdivision consists of 148 Lots (including a grouped housing) plus one Lot for Kalgulup Regional Park and another Lot for Public Open Space and Drainage.

Under the proposed Amendment 2 to ASP27 "Southbank@eaton", the proposed residential density code for the grouped housing site is R40. A theoretical maximum yield based on the revised plan of subdivision and proposed density code is 19 dwellings. However, to be conservative, a yield of 21 dwellings has been used for the purposes of this assessment.

The road network in the revised subdivision plan is designed to integrate with the road layout proposed in Amendment 1 to the Parkridge Estate Structure Plan (refer **Appendix D** for the revised subdivision plan in the context of the amended Parkridge Estate Structure Plan). Therefore, if Amendment 1 is approved, the revised subdivision plan for Southbank will continue to be suitable and function efficiently. However, if Amendment 1 is not approved, the original approved subdivision road network will need to be implemented, which will require minor adjustments to revert the revised subdivision back to the original approved plan being the inclusion of the central east-west 15m local access street.

A review of the road reserve widths along the connection points between the revised subdivision plan and the approved and amended Parkridge Estate Structure Plan reveals that the revised subdivision has used a similar road reserve width as the endorsed and amended Parkridge Estate Structure Plan. This alignment of the road reserve widths between the two developments would facilitate the integration of the movement networks.

The details of the road cross-sections and their final alignment would need to be investigated further as part of the subdivision plan for the Parkridge Estate. It is our understanding that both the Southbank and Parkridge Estates would be willing to work together to achieve this integrated outcome.

The revised subdivision plan will be connected to Eaton Drive via a priority-controlled T-intersection, at Road 3/Eaton Drive intersection. Currently, a seagull island is provided on Eaton Drive, which will facilitate the future intersection at this location.

The appropriate layout of the intersection on the western side of Eaton Drive (at Road 3) will need to be investigated and finalised during the detailed design stage of the development.

4 Existing Situation

4.1 Existing Land Use

Currently, there is an ongoing subdivision development in southern part of the subject site which is progressing towards north.

4.2 Existing Road Network

The existing road network and its classification in the Main Roads WA functional road hierarchy is illustrated in **Figure 2**.

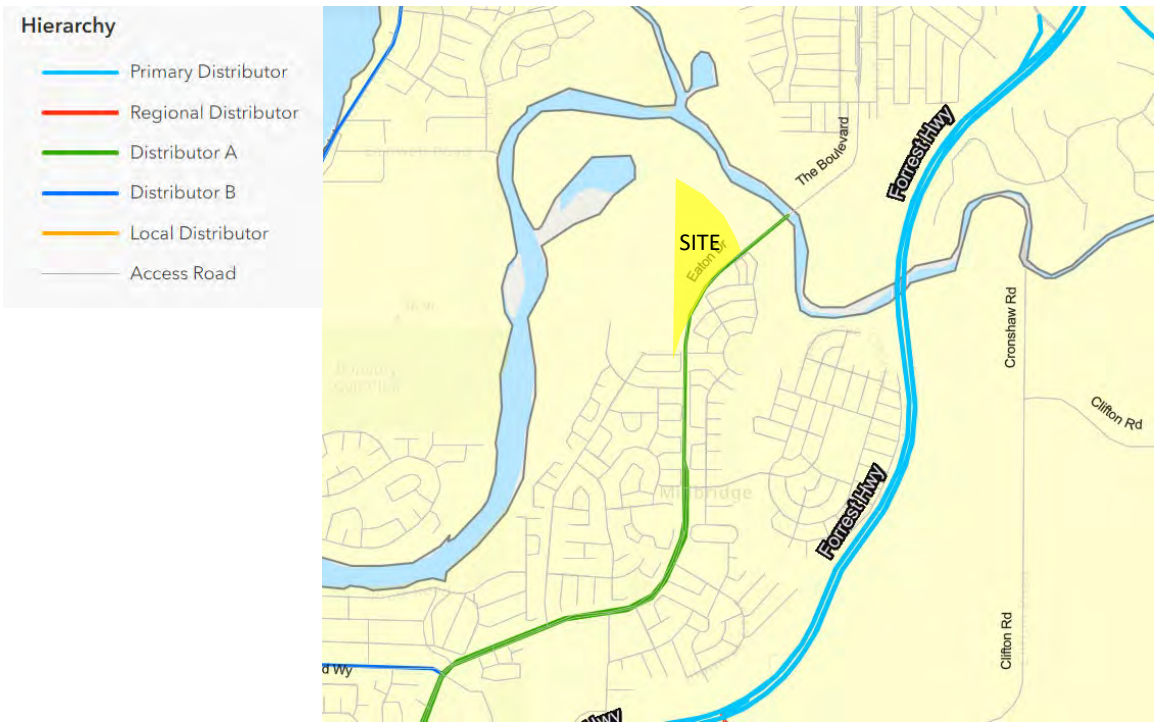

Figure 2: Existing road hierarchy

Eaton Drive is classified as a Distributor A road, which connects the suburbs of Eaton and Millbridge to Forrest Highway and the city of Bunbury.

Between Forrest Highway and the subject site, Eaton Drive is constructed as a four-lane divided carriageway. North of the subject site, Eaton Drive transitions to a single lane in each direction. The existing posted speed limit on surrounding roads are shown in **Figure 3**.

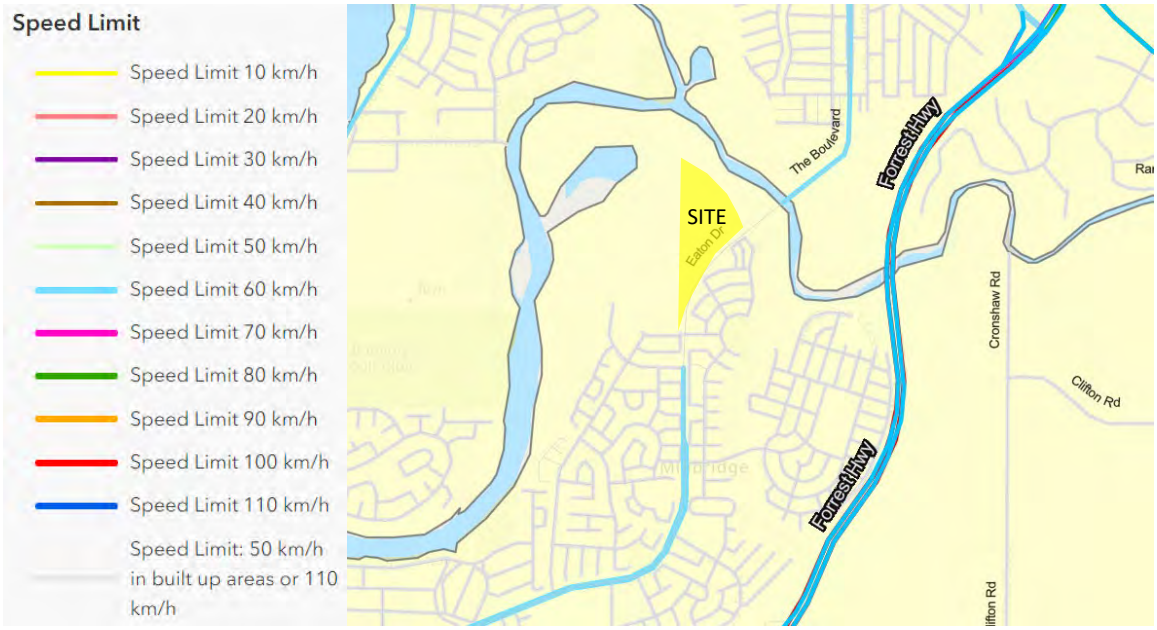

Figure 3: Existing posted speed limits

4.3 Existing Traffic Volumes

Existing average weekday traffic (AWT) volumes on surrounding roads have been obtained from Main Roads WA and are illustrated in Figure 4.

Figure 4: Existing traffic volumes

The existing turning counts at the intersection of Peninsula Drive/ Eaton Drive were also sourced from Main Roads WA traffic map (dated Thursday 9th June 2022). Figure 5 illustrates the existing peak hour traffic counts at the intersection.

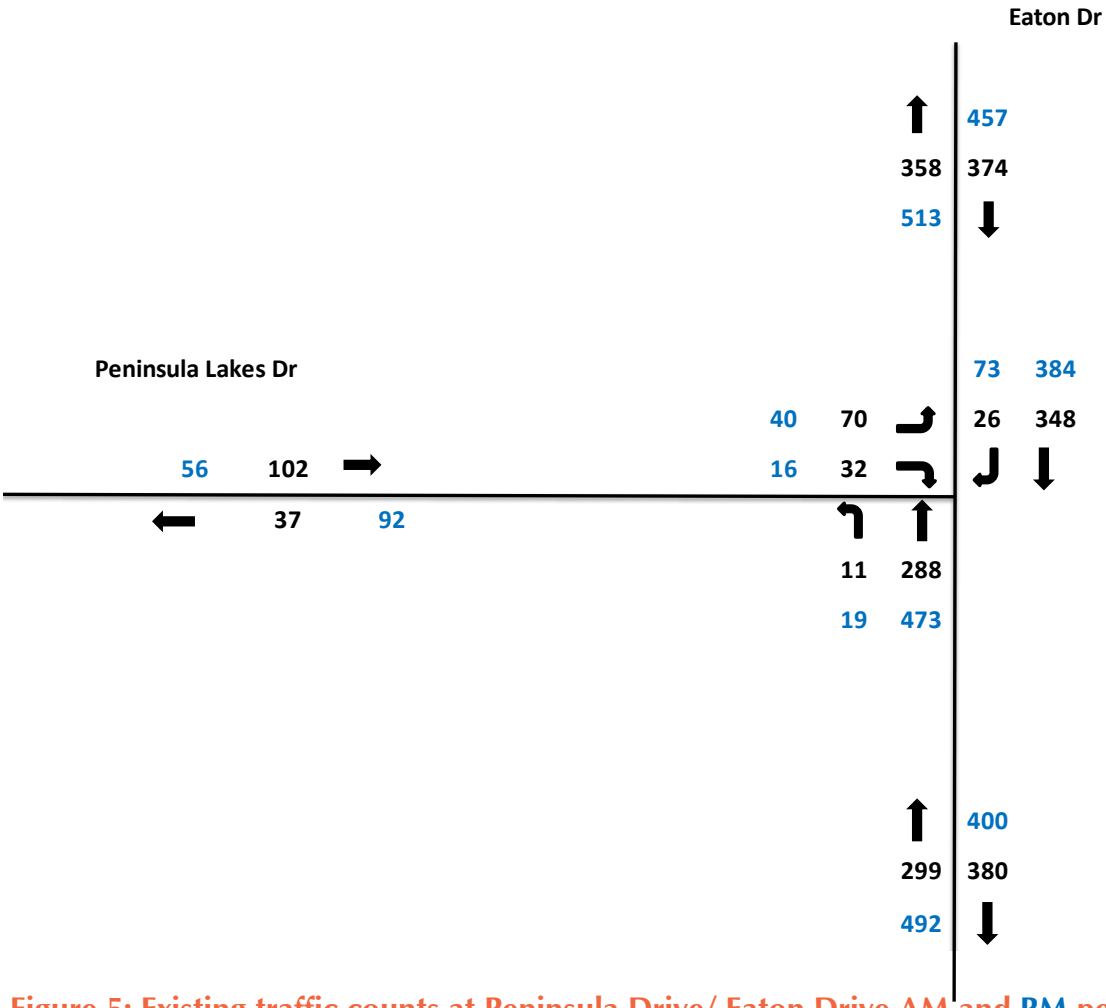

Figure 5: Existing traffic counts at Peninsula Drive/ Eaton Drive AM and PM peak hours

4.4 Public Transport

The bus routes surrounding the site are shown in Figure 6. Route 844 (Bunbury – Eaton/Millibridge) runs along Peninsula Lakes Drive to the south of the proposed Parkride and Millbridge Structure Plan areas while Route 845 (Bunbury – Australind) runs along Eaton Drive to the east. Both routes begin at the Bunbury Bus station. Route 844 terminates at Millbridge Boulevard/Braddon Way, while Route 845 terminates at Kingston Drive/Holbrook Road to the northwest of the Site.

Figure 6: Existing Bus Routes

4.5 Pedestrian and Cyclist Facilities

Currently, shared paths are present on both sides of Eaton Drive. These existing shared paths are anticipated to be the primary pedestrian and bicycle connections from the proposed subdivision site to the surrounding areas.

This existing shared path network along Eaton Drive will allow future residents of the proposed subdivision to safely walk or cycle to nearby destinations including the existing bus stops.

4.6 Changes to the surrounding road network

As part of the proposed subdivision a full movement intersection will be constructed on Eaton Drive. The road network of the proposed subdivision will also connect to the road network of the proposed Parkridge Estate in a number of locations.

4.7 Public Transport Network Planning

There are no immediate plans to modify the TransBunbury network within the area.

5 Proposed Internal Transport Network

5.1 Road Hierarchy

The proposed hierarchy of roads within the proposed subdivision area is generally in line with the original approved SP and is illustrated in Figure 7. The proposed road hierarchy was based on traffic projections and the road classification of the WAPC Liveable Neighbourhoods guidelines (2007).

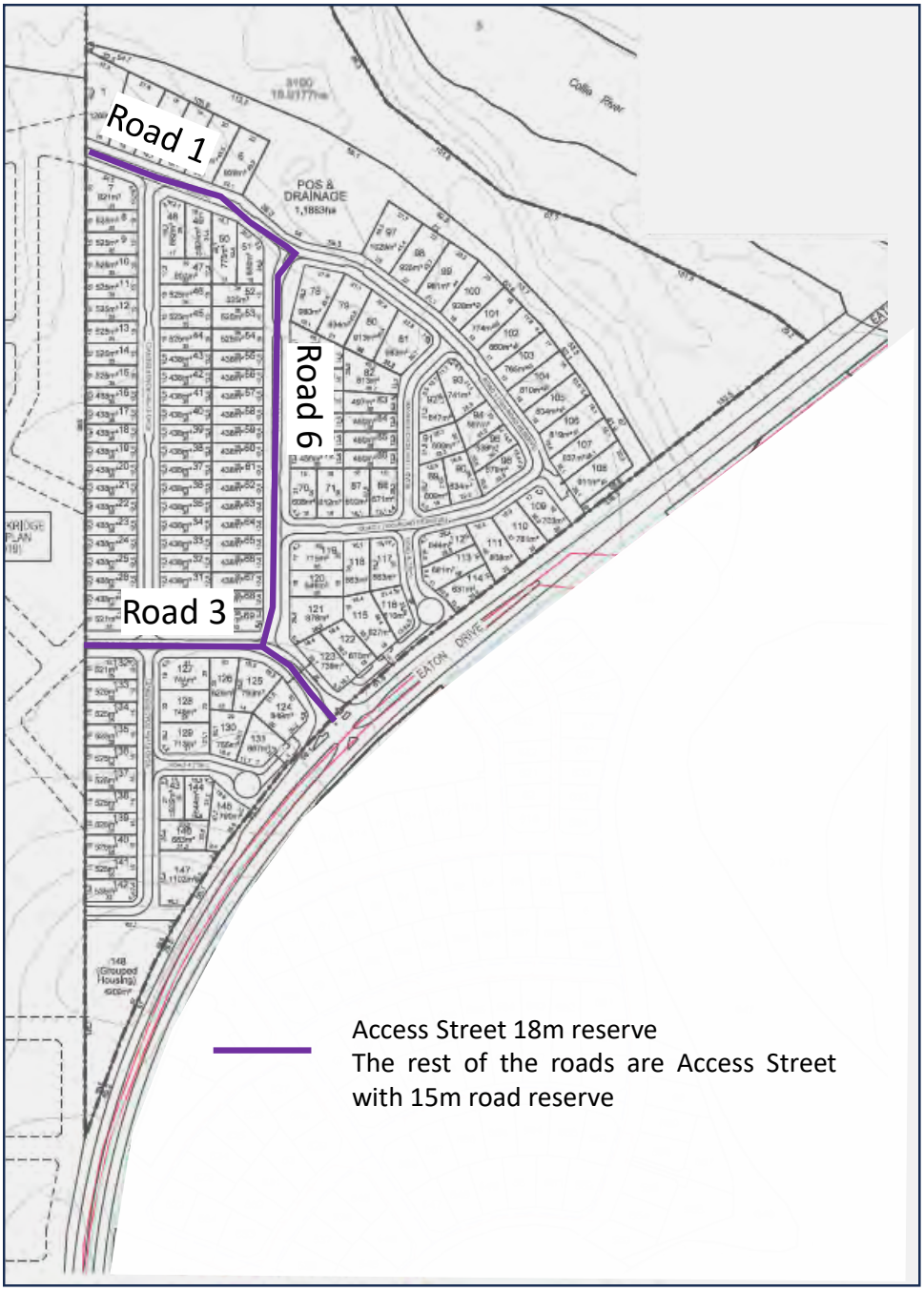

Figure 7: Proposed Road Hierarchy

The projected traffic volumes on all subdivision road network are estimated to be less than 3,000vpd and all subdivision roads can be classified as Access Streets.

The majority of the proposed subdivision internal roads are classified as Access Street D roads. The Access Street D typical cross section entails 4.5m verges on both sides, with embayed parking provided in the verges as appropriate, such as for visitor parking for rear loading lots. Access Street D classification is proposed for the local roads with less than 1,000vpd.

The proposed revised subdivision plan has designated a wider road reserve width of approximately 18 metres for Road 1 and Road 3. These roads will provide the key connections to the adjacent Parkridge Estate development.

Similarly, Road 6, which is the primary north-south road within the proposed subdivision and connects Road 1 and Road 3, has also been planned with an 18-metre road reserve width.

The plan of revised subdivision includes a widening of the road at the intersection of Road 3 and Eaton Drive. This widening will accommodate separate left-turn and right-turn lanes at this intersection. However, SIDRA intersection analysis undertaken indicates that the widening in the form of separate left and right turn lanes may not be required at the Road 3 and Eaton Road intersection.

The internal road network will be designed to accommodate suitable service vehicles. Waste collection for the proposed subdivision will be as per the standard arrangement for residential developments throughout the Shire od Dardanup. This consists of rubbish bins wheeled out by the residents for verge collection on the designated collection day. A bin pad will be provided for the residents that would live along the proposed 10m laneway between Road 3 and Road 8 (Lots 115,116, 122 and 123) to facilitate this collection process. The location of the proposed bin pad in the plan of subdivision is indicative only and would be subject to further investigation at the detailed design stage.

5.2 Integration with Surrounding Area

The proposed land uses within the proposed subdivision are residential and are in line with the approved SP. The road network of the proposed subdivision area is proposed to connect to the neighbouring landholding at a number of locations to improve permeability and facilitate connection to surrounding regional roads.

6 Analysis of the Transport Network

6.1 Assessment Period

The assessment year that has been adopted for this analysis is 2038, with the assumption of full development of the Southbank and Parkridge Estate.

6.2 Traffic generation and distribution

The daily traffic generation rate used for this transport assessment is 8 vehicle trips per day (vpd) per dwelling, which corresponds to peak hour trip generation rates of 0.8vph per dwelling recommended in the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines* (2016).

The proposed subdivision is expected to accommodate approximately 169 dwellings (148 + 21 grouped housing) which would generate 1,352 trips per day or 135vph. These figures include both inbound and outbound vehicle movements. The AM and PM peak hour trip generation of the proposed subdivision is also summarised in **Table 1**.

Table 1: Subdivision peak hour trip generation

Land use	Quantity	AM trips	PM trips	AM		PM	
				IN	OUT	IN	OUT
Proposed subdivision	169	135	135	41	95	85	51

Review of the turning traffic counts at the existing Peninsula Lakes Drive/Eaton Drive intersection indicates that approximately 70% and 80% of the existing residents would travel northbound on Eaton Drive during the AM and PM peak hours, respectively, with the remaining balance traveling southbound on Eaton Drive.

To provide a robust assessment, it is assumed that all traffic from the proposed subdivision would utilise the subdivision access intersection at Road 3/Eaton Drive. Based on this assumption, the trip distribution at the Road 3/Eaton Drive intersection is illustrated in **Figure 8**.

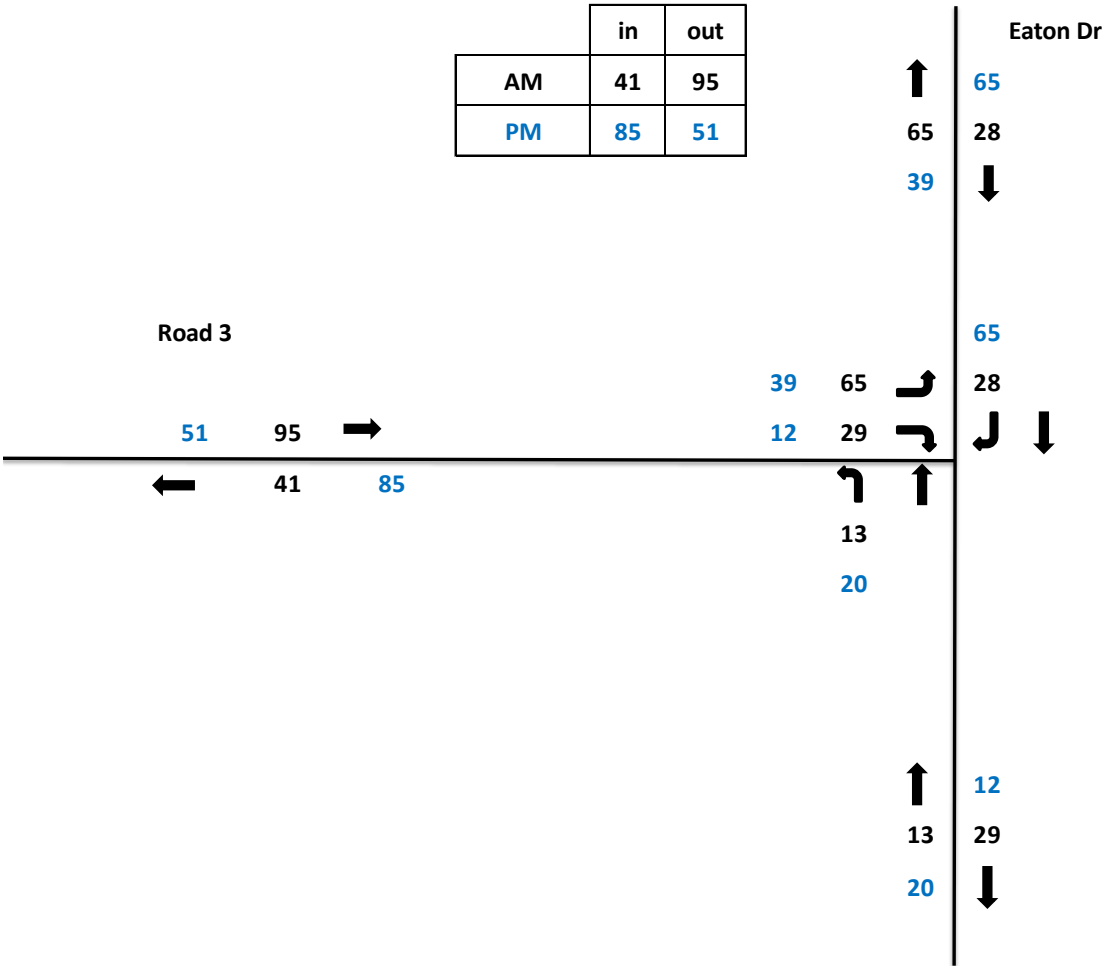

Figure 8: Subdivision traffic distribution at Eaton Drive intersection AM/ PM peak hour

Review of the Riley Consulting TIA for Parkridge Estate approved SP (April 2018) indicates that "*the concept layout for Parkridge indicates the North Stage to yield 316 lots, South Stage 211 lots and the River Stage 48 lots. In total the development could yield 575 residential lots*".

Stantec TIA for Parkridge Estate amended SP (Jan 2025) assumed 354 dwellings for Parkridge Estate.

Considering that the amended SP for Parkridge Estate is not approved, conservatively the trip generation of the approved Parkridge Estate SP has been used for establishing the traffic interaction between the Southbank and Parkridge Estate. On this basis the total 575 residential lots within the Parkridge Estate would generate about 4,600vpd or 460vph out of which about 2,528vpd or 253vph would be associated to the North Stage.

It is expected that some of the Parkridge Estate traffic (particularly the residents of North Stage) that would like to travel north would use the proposed subdivision connection on Eaton Drive, as it is easier to travel north rather than heading south towards Peninsula Lakes Drive and travelling north along Eaton Drive. Similarly, some

of the Parkridge Estate residents who return from the north would turn right into Road 3 of the subdivision rather than going further south to turn right into Peninsula Drive.

For the sake of robust assessment, it is assumed that all the residents of North Stage within Parkridge Estate who would like to travel north/ or return from north on Eaton Drive would use the subdivision Road 3 and its intersection with Eaton Drive. The trip distribution of Parkridge Estate at the Road 3/Eaton Drive intersection is illustrated in Figure 9.

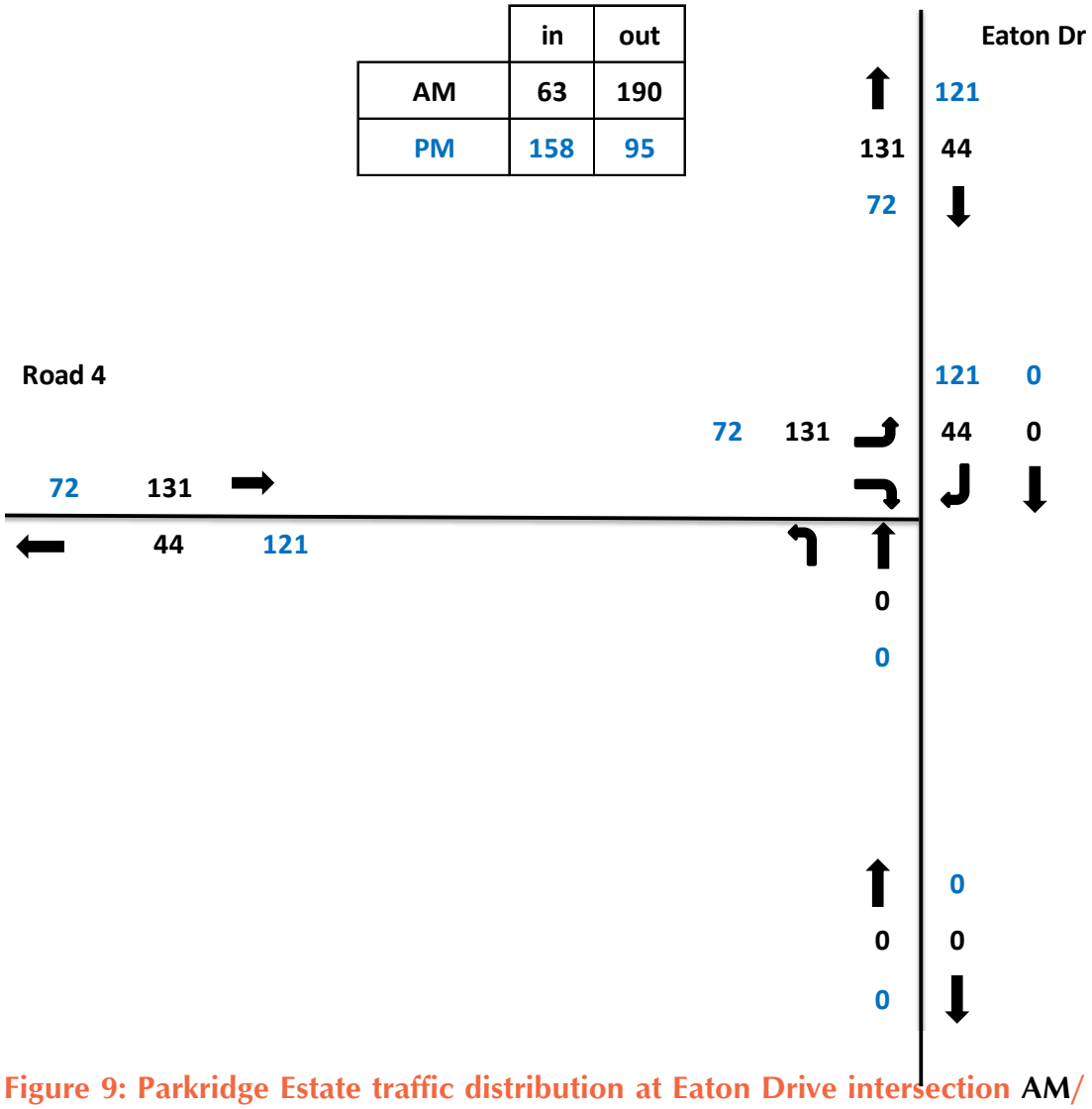

Figure 9: Parkridge Estate traffic distribution at Eaton Drive intersection AM/ PM peak hour

6.3 Traffic flow forecast on Surrounding roads

The peak hour traffic projections are illustrated in Figure 10. For through traffic on Eaton Drive a general 2% growth rate have been applied from 2022 to 2038 (16 years).

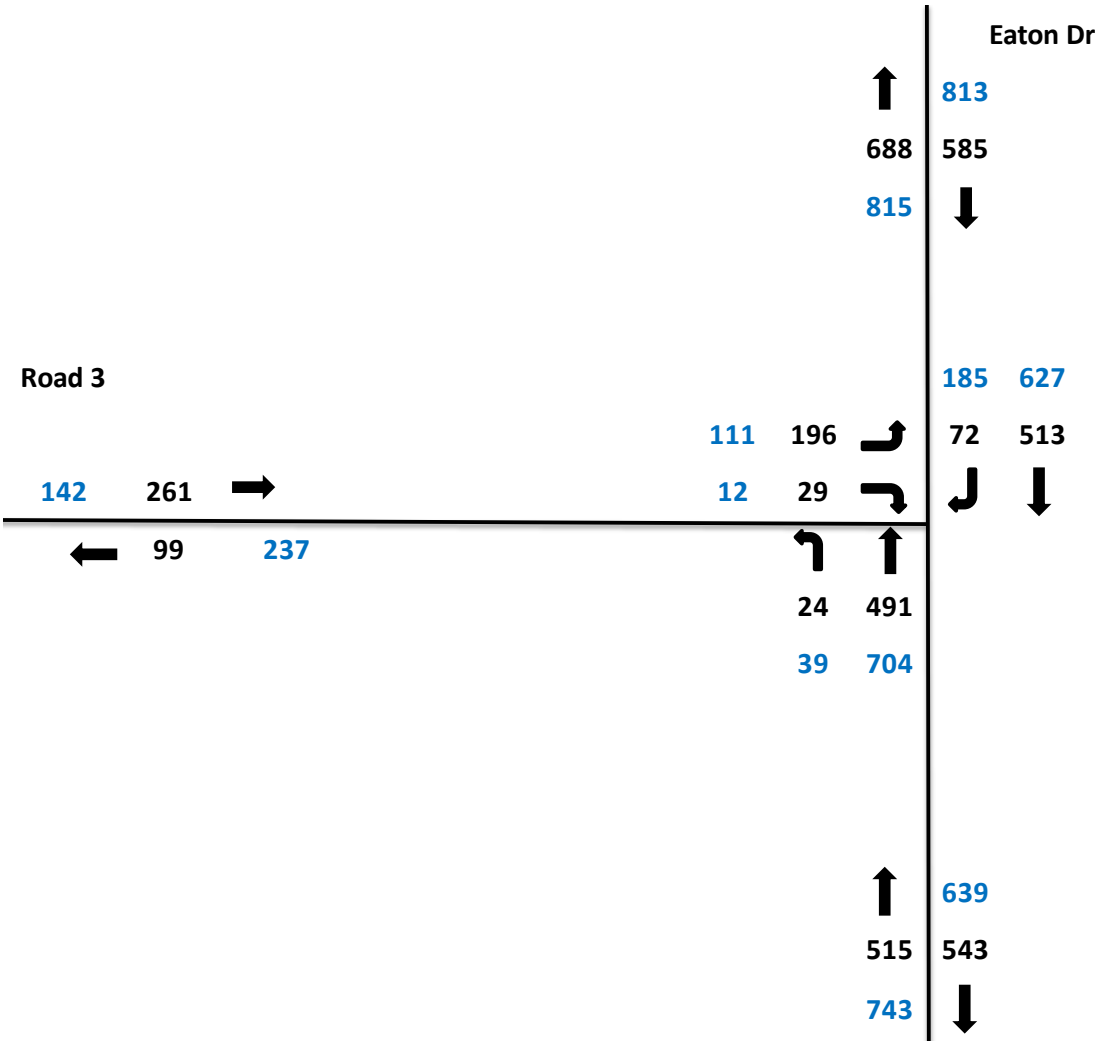

Figure 10: 2038 traffic projections at Eaton Drive intersection AM/ PM peak hour

6.4 Roads and Intersections

Figure 11 illustrates proposed intersection controls for key intersections within the subdivision area. There are two four-way intersections shown on the subdivision internal road network on low-traffic-volume roads. These intersections are recommended to be constructed as priority-controlled intersections with Give Way control on the minor road approaches as suggested in Liveable Neighbourhoods document. Appropriate entry treatments are recommended on the side roads to help to alert drivers to the presence of the intersections and that traffic on the major road has priority.

The subdivision access intersection at Eaton Drive (Road 3 / Eaton Drive) will be in the form of a priority-controlled T-intersection.

Currently, there is a right-turn lane of approximately 75 metres in place on Eaton Drive at this intersection, along with a seagull island. This existing infrastructure facilitates the right-turn movements in and out of the proposed subdivision area.

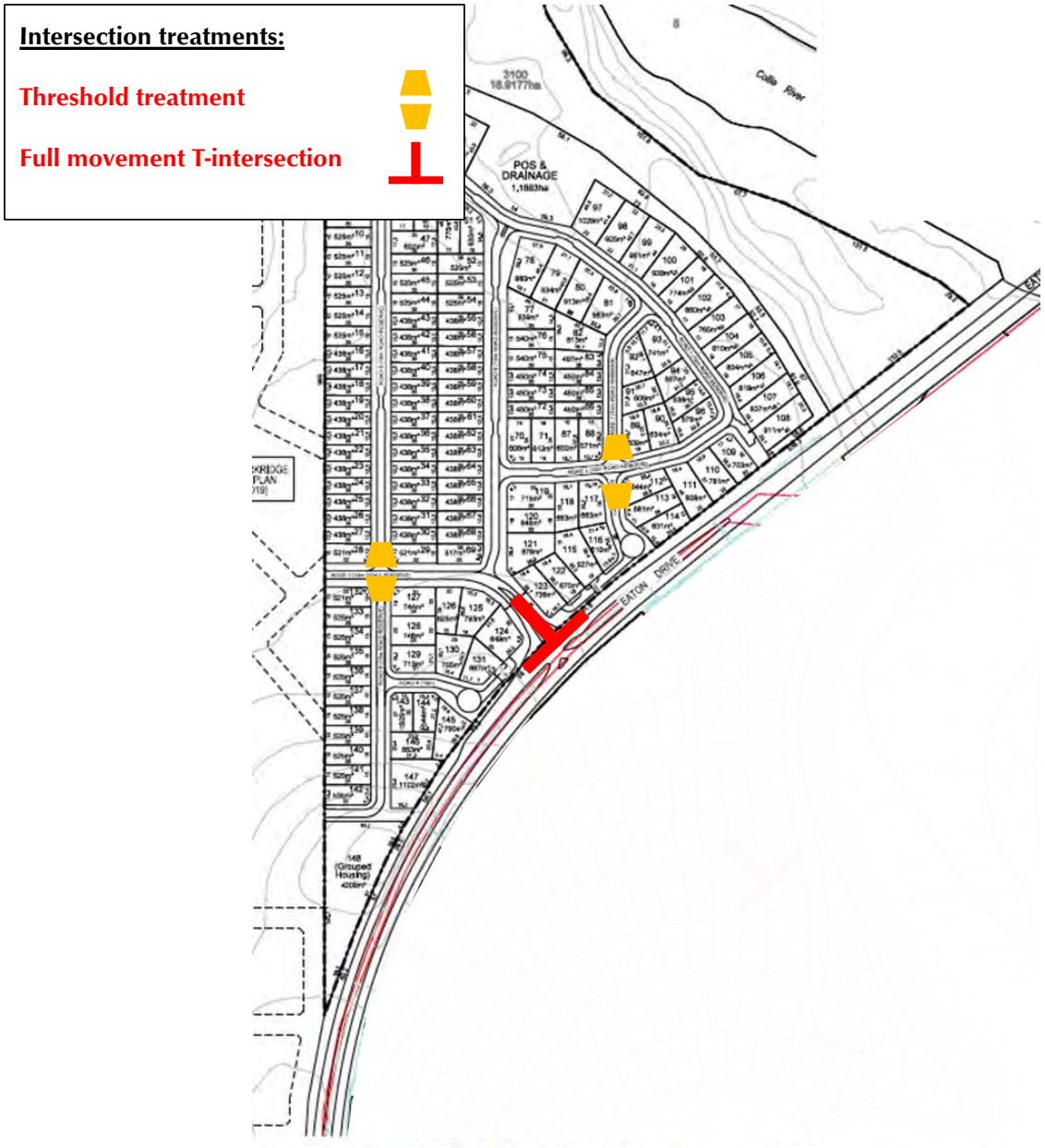

Figure 11: Proposed intersection treatments

6.5 Intersection Analysis

The operation of the Road 3/ Eaton Drive intersection was analysed in SIDRA for the weekday AM and PM peak hours in 2038.

SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation (DoS)**: is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service (LoS)**: is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay**: is the average of all travel time delays for vehicles through the intersection.
- **95% Queue**: is the queue length below which 95% of all observed queue lengths fall.

The results of the SIDRA analysis are attached in **Appendix E** and briefly discussed in the following paragraphs.

Road 3/ Eaton Drive intersection

The existing layout of Eaton Drive at the proposed Road 3 intersection is shown in **Figure 12**. This includes a large median and seagull island on Eaton Drive, which would facilitate a two-stage crossing for right-turn movements out of Road 3 onto Eaton Drive. Additionally, the free-flow right-turn lane on Eaton Drive would further assist the second stage of the right-turn movement.

The layout of the intersection modelled in SIDRA is illustrated in **Figure 13**. This SIDRA model reflects the existing seagull island and right-turn lane on Eaton Drive, but does not include any widening on Road 3.

The SIDRA analysis results indicate that this intersection, with the layout shown in **Figure 13**, would operate satisfactorily during the 2038 AM and PM peak hours, with minimal queues and delays on all approaches.

While the SIDRA modelling suggests that the widening of Road 3 to provide separate left and right-turn lanes (as shown in the subdivision plan) may not be necessary, it is recommended that the final layout of the intersection be reviewed and refined during the detailed design stage. This will ensure the intersection is optimised to safely and efficiently accommodate the anticipated traffic movements and pedestrian movements at the intersection.

Figure 12: Existing layout of the Eaton Road at future Road 3 intersection

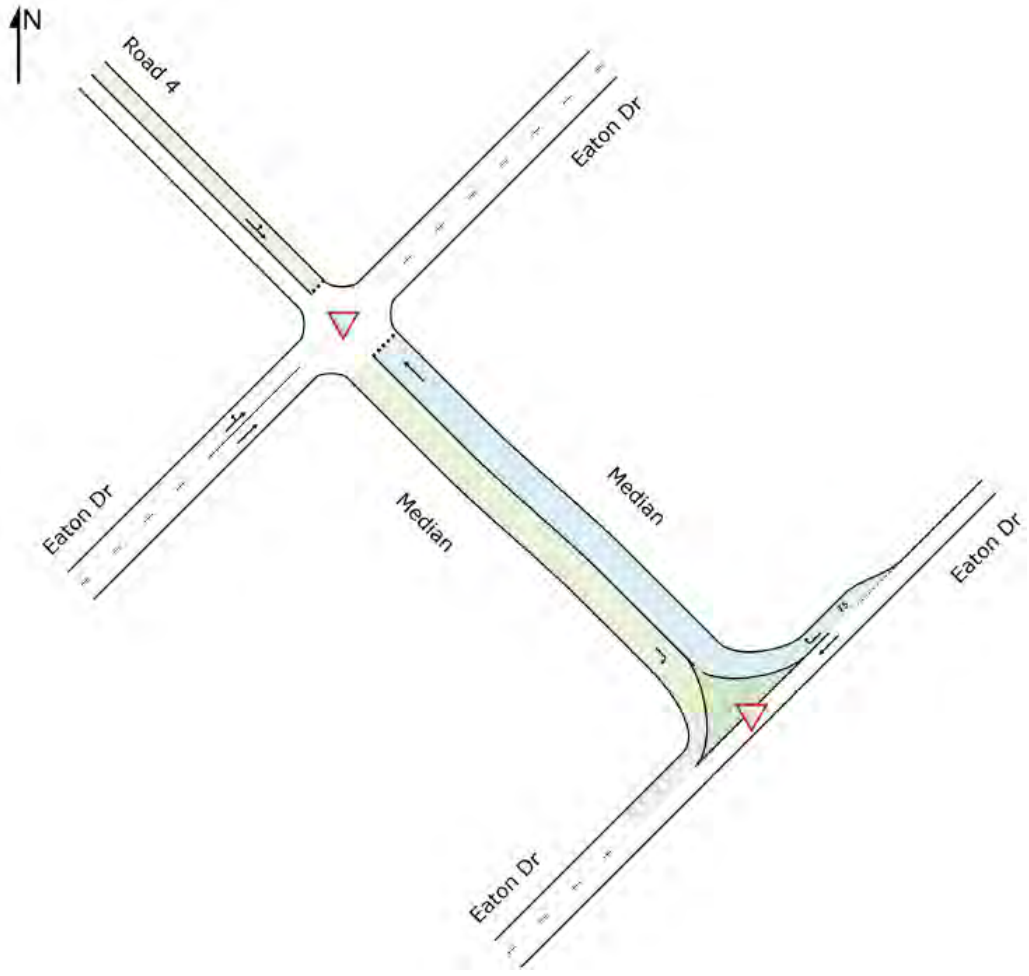

Figure 13: The intersection layout modelled in SIDRA

6.6 Access to Frontage Properties

The WAPC *Liveable Neighbourhoods* policy requires that "Development along integrator B and neighbourhood connector streets with ultimate vehicle volumes over 5000 vehicles per day should be designed either so vehicles entering the street can do so travelling forward, or are provided with alternative forms of vehicle access. Wider lots with paired driveways and protected reversing areas in the parking lane may be used on streets with up to 7000 vehicles per day."

All of the roads within the proposed subdivision area are expected to carry less than 5,000vpd, so no restriction on vehicular access is required.

6.7 Pedestrian/ Cycle Network

Pedestrian access to/from the proposed subdivision will be provided via the existing shared paths along Eaton Drive. These existing paths on both sides of Eaton Drive will serve as the primary pedestrian connections from the subdivision to the surrounding areas.

Within the proposed subdivision itself, all access streets will have a 2.0-meter-wide footpath constructed on one side of the street.

The existing shared paths on Eaton Drive, combined with the new subdivision footpaths, will create a pedestrian circulation network to serve the residents of the subdivision and facilitate connectivity to the broader community.

6.8 Access to Public Transport

The WAPC *Transport Assessment Guidelines for Developments* (2006) suggest that it is desirable for at least 90 per cent of dwellings to be within 400m straight line distance of a bus route. The existing bus route 845 on Eaton Drive will cover the majority of the dwellings within the proposed subdivision.

7 Conclusion

This Revised Traffic Impact Assessment (TIA) has been prepared by Transcore on behalf of Ardross Estates (S.A.) Pty Ltd for the proposed revised subdivision at Lot 3001 Eaton Drive, known as Southbank, located in the Shire of Dardanup.

The Parkridge Estate is located immediately to the west of the Southbank. The traffic modelling and analysis undertaken in this TIA considers the full development of both Estates and the potential traffic interaction between them.

Transcore initially prepared a Traffic Impact Assessment (TIA) in July 2024 for the original subdivision, which was approved in March 2025 (WAPC ref no. 201093). Recently, Taylor Burrell Barnett (TBB) has developed a revised subdivision plan that includes minor amendments to the approved layout, such as three connection points to the Parkridge Estate and an additional 28 lots.

The road network in the revised subdivision plan is designed to integrate with the layout proposed in Amendment 1 to the Parkridge Estate Structure Plan. If Amendment 1 is approved, the revised subdivision plan for Southbank will remain suitable and function efficiently. Conversely, if Amendment 1 is not approved, the original approved subdivision road network must be implemented, requiring minor adjustments to revert the revised subdivision back to the original subdivision plan.

The proposed revised subdivision is expected to accommodate approximately up to 169 dwellings (148 + 21 grouped housing) which would generate 1,352 trips per day or 135vph.

The existing layout of Eaton Drive includes a large median and seagull island that would facilitate a two-stage crossing for right-turn movements out of Road 3 onto Eaton Drive, further supported by the free-flow right-turn lane on Eaton Drive.

The intersection layout modelled in SIDRA reflects these existing features on Eaton Drive but does not include any widening on Road 3, and the SIDRA analysis indicates this intersection would operate satisfactorily during the 2038 peak hours, though it is recommended that the final layout be reviewed and refined during the detailed design stage to ensure it is optimised to safely and efficiently accommodate both vehicular and pedestrian movements at the intersection.

The proposed hierarchy of roads within the proposed subdivision area is generally in line with the original approved SP.

The updated transport modelling and analysis conducted in this Revised TIA indicate that the proposed minor amendments to the approved subdivision plan will not alter the outcomes of the assessments carried out in the original TIA for the approved subdivision.

Appendix A

APPROVED GARDEN OF EATON LOCAL STRUCTURE PLAN

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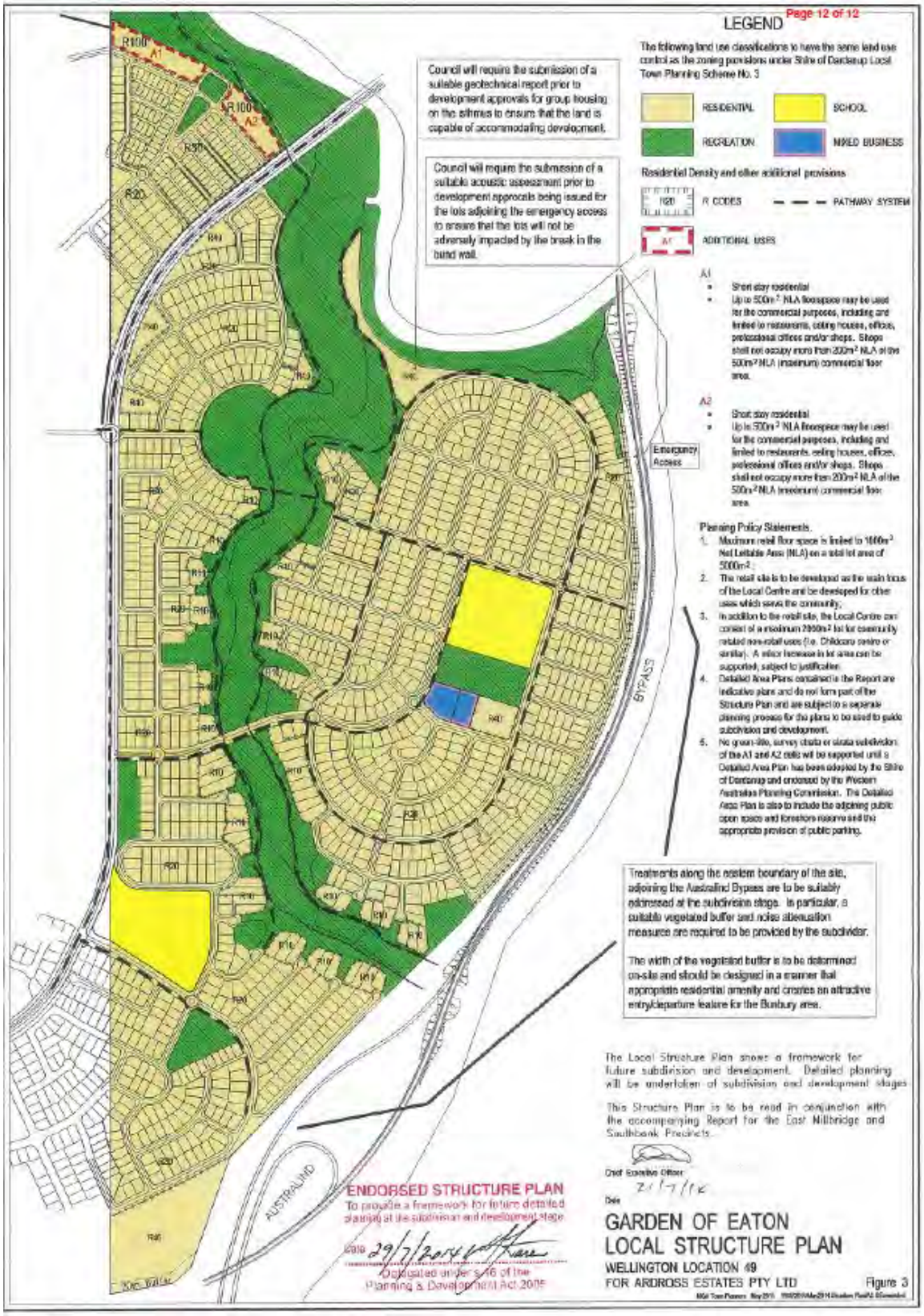
LEGEND
Page 12 of 12
The following land use classifications to have the same land use control as the zoning provisions under Shire of Dardanup Local Town Planning Scheme No. 3
RESIDENTIAL
SCHOOL
RECREATION
MIXED BUSINESS
Residential Density and other additional provisions
R CODES
PATHWAY SYSTEM
ADDITIONAL USES
Council will require the submission of a suitable geotechnical report prior to development approvals for group housing on the sitmas to ensure that the land is capable of accommodating development.
Council will require the submission of a suitable acoustic assessment prior to development approvals being issued for the lots adjoining the emergency access to ensure that the lots will not be adversely impacted by the break in the bund wall.
A1
Short stay residential
Up to 500m² NLA floorspace may be used for the commercial purposes, including and limited to restaurants, eating houses, offices, professional offices and/or shops. Shops shall not occupy more than 200m² NLA of the 500m² NLA (maximum) commercial floor area.
A2
Short stay residential
Up to 500m² NLA floorspace may be used for the commercial purposes, including and limited to restaurants, eating houses, offices, professional offices and/or shops. Shops shall not occupy more than 200m² NLA of the 500m² NLA (maximum) commercial floor area.
Emergency Access
Planning Policy Statements.
1. Maximum retail floor space is limited to 1000m² Net Lettable Area (NLA) on a total lot area of 5000m².
2. The retail site is to be developed as the main focus of the Local Centre and be developed for other uses which serve the community.
3. In addition to the retail site, the Local Centre can consist of a maximum 2000m² lot for community related non-retail uses (i.e. Childcare centre or similar). A minor increase in lot area can be supported, subject to justification.
4. Detailed Area Plans contained in the Report are indicative plans and do not form part of the Structure Plan and are subject to a separate planning process for the plans to be used to guide subdivision and development.
6. No green-title, survey strata or strata subdivision of the A1 and A2 lots will be supported until a Detailed Area Plan has been adopted by the Shire of Dardanup and endorsed by the Western Australian Planning Commission. The Detailed Area Plan is also to include the adjoining public open space and foreshore reserve and the appropriate provision of public parking.
Treatments along the eastern boundary of the site, adjoining the Australind Bypass are to be suitably addressed at the subdivision stage. In particular, a suitable vegetated buffer and noise attenuation measure are required to be provided by the subdivider.
The width of the vegetated buffer is to be determined on-site and should be designed in a manner that appropriate residential amenity and creates an attractive entry/departure feature for the Bunbury area.
The Local Structure Plan shows a framework for future subdivision and development. Detailed planning will be undertaken at subdivision and development stages.
This Structure Plan is to be read in conjunction with the accompanying Report for the East Millbridge and Southbank Precincts.
Chief Executive Officer
Date
ENDORSED STRUCTURE PLAN
To provide a framework for future detailed planning at the subdivision and development stage
Date 29/7/2014
Delegated under s.16 of the Planning & Development Act 2005
GARDEN OF EATON
LOCAL STRUCTURE PLAN
WELLINGTON LOCATION 49
FOR ARDROSS ESTATES PTY LTD
Figure 3
BYPASS
AUSTRALIND

Appendix B

APPROVED PARKRIDGE ESTATE LOCAL STRUCTURE PLAN

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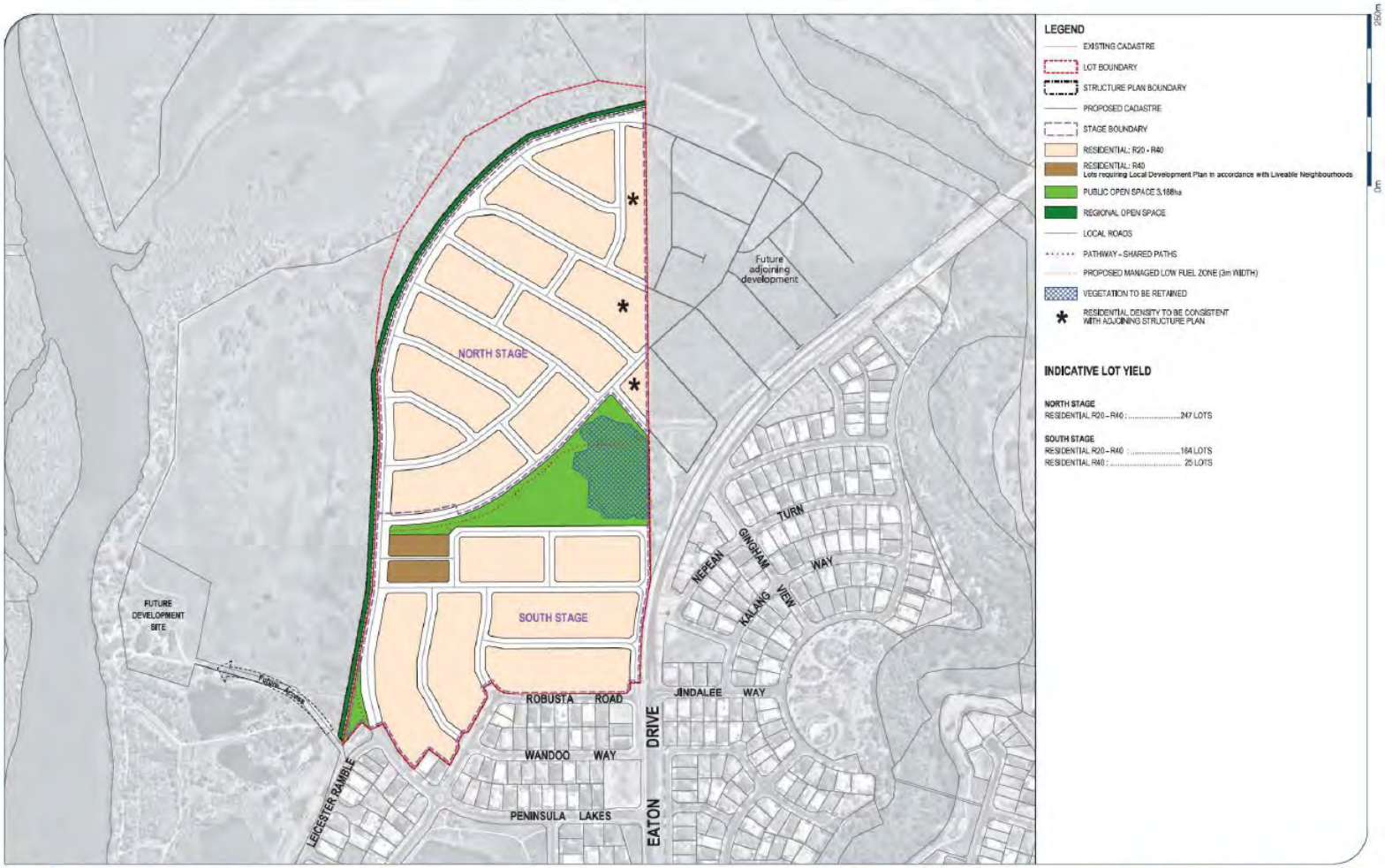

Figure 1 - Local Structure Plan

Appendix C

AMENDED PARKRIDGE ESTATE LOCAL STRUCTURE PLAN

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LEGEND
EXISTING CADASTRE
STRUCTURE PLAN MODIFICATION BOUNDARY
PROPOSED CADASTRE
RESIDENTIAL: R40
RESIDENTIAL: R30 - R40
RESIDENTIAL: R20
PUBLIC OPEN SPACE
REGIONAL OPEN SPACE
MANAGED LOW FUEL ZONE
RESIDENTIAL DENSITY TO BE CONSISTENT WITH ADJOINING STRUCTURE PLAN
PATH NETWORK
PATH NETWORK & FIRE SERVICE ACCESS ROUTE
FLOODWAY
CONSERVATION CATEGORY WETLAND
LOCAL ROADS
21m Reserve
18m Reserve
15m Reserve
12.5m Reserve
9m Reserve
Plan 1 – Structure Plan Map
MILLBRIDGE ESTATE
Subject to separate Structure Plan
Area currently under development
Existing dwelling
Area subject to further investigation
DRIVE
INDALEE WAY
NIGGAN WAY
GINGHAM VIEW
KALANG TURN
ROBUSTA ROAD
WANDOO WAY
PENINSULA LAKES
LEICESTER RAMBLE
STRUCTURE PLAN MODIFICATION
Robusta Road, Eaton
PARKRIDGE
Plan No. | 23296-07
Date | 17/02/25
Drawn | NP
Checked | KS
Revision | L
Scale | 1:5000@A3
BUNBURY OFFICE:
ALBANY | BUNBURY | BUSSELTON | FORRESTDALE | PERTH
Harley Dykstra
PLANNING & SURVEY SOLUTIONS

Appendix D

PLAN OF SUBDIVISION

transcore

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LEGEND
LOT SUMMARY
POS (Kalgulup Regional Park)
POS & DRAINAGE
EATON DRIVE
APPROVED PARKRIDGE STRUCTURE PLAN LAYOUT (2019)
Plan of Subdivision - Freehold
LOT 3001 EATON DRIVE, EATON
Taylor Burrell Barnett

LEGEND
TOTAL APPLICATION AREA (19.917ha)
PROPOSED BIN PADS FOR LOTS 95, 96, 102 & 103
SERVICES
WATER
FIPE
SEWER
CONNECTION
GRAVITY PIPE
PRESSURE MAIN
ELECTRICAL
UNDERGROUND DISTRIBUTION LINE
DISTRIBUTION POLE/LIGHT POLE/PILLAR
LOT SUMMARY
LOT YIELD
LOT AREA
Size
No. Lots
% Total Lots
Average Size
% of Total Area
320m² - 449m²
40
27.03%
438m²
18.59%
450m² - 499m²
7
4.73%
496m²
3.39%
500m² - 549m²
33
22.30%
525m²
18.42%
550m² - 599m²
3
2.03%
572m²
1.62%
600m² - 649m²
22
14.86%
637m²
14.88%
700m² - 749m²
14
9.46%
732m²
11.18%
800m² - 899m²
10
6.76%
858m²
12.49%
900m² - 999m²
10
6.76%
1,139m²
9.94%
1000m² - 4899m²
4
2.70%
1,529m²
5.04%
5000m² - 4899m²
1
0.68%
4306m²
4.47%
Number of Lots
148
Minimum Lot Size 439m²
Maximum Lot Size 4306m²
Average Lot Size 636m²
Total Lot Area 9425.1m²
Kalgulup Regional Park
1
Public Open Space
1
Drainage
1
Total Number of Lots
150
STRUCTURE PLAN LEGEND
EXISTING CADASTRE
STRUCTURE PLAN MODIFICATION BOUNDARY
PROPOSED CADASTRE
RESIDENTIAL: R40
RESIDENTIAL: R30 - R40
RESIDENTIAL: R20
PUBLIC OPEN SPACE
REGIONAL OPEN SPACE
MANAGED LOW FUEL ZONE
RESIDENTIAL DENSITY TO BE CONSISTENT WITH ADJOINING STRUCTURE PLAN
PATH NETWORK
PATH NETWORK & 11RE SERVICE ACCESS ROUTE
FLOODWAY
CONSERVATION CATEGORY WETLAND
LOCAL ROADS
21m Reserve
18m Reserve
15m Reserve
12.5m Reserve
9m Reserve
Plan of Subdivision - Context Plan
(Parkridge Estate Structure Plan Amendment 1- Reconsideration)
LOT 3001 EATON DRIVE, EATON
An Andrews Estates Project
Taylor Burrell Barnett

Appendix E

SIDRA ANALYSIS

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MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 1 - 2038 - AM (Site Folder: 2038)]

Network: N101 [AM (Network Folder: 2038)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Median															
5	T1	All MCs	31	2.0	31	2.0	0.035	2.1	LOS A	0.1	0.9	0.46	0.36	0.46	29.1
Approach			31	2.0	31	2.0	0.035	2.1	LOS A	0.1	0.9	0.46	0.36	0.46	29.1
NorthWest: Road 4															
1	L2	All MCs	206	2.0	206	2.0	0.196	5.6	LOS A	0.8	6.4	0.38	0.58	0.38	42.3
2	T1	All MCs	31	2.0	31	2.0	0.196	6.7	LOS A	0.8	6.4	0.38	0.58	0.38	28.9
Approach			237	2.0	237	2.0	0.196	5.7	LOS A	0.8	6.4	0.38	0.58	0.38	41.8
SouthWest: Eaton Dr															
3	L2	All MCs	25	2.0	25	2.0	0.146	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	47.4
4	T1	All MCs	517	4.0	517	4.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach			542	3.9	542	3.9	0.146	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles			809	3.3	809	3.3	0.196	1.9	NA	0.8	6.4	0.13	0.20	0.13	47.8

MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 2 - 2038 - AM (Site Folder: 2038)]

Network: N101 [AM (Network Folder: 2038)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
NorthEast: Eaton Dr															
2	T1	All MCs	540	4.0	540	4.0	0.291	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
3	R2	All MCs	76	2.0	76	2.0	0.043	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	44.5
Approach			616	3.8	616	3.8	0.291	0.7	NA	0.0	0.0	0.00	0.07	0.00	49.5
NorthWest: Median															
1	R2	All MCs	31	2.0	31	2.0	0.016	0.2	LOS A	0.0	0.0	0.00	0.05	0.00	20.0
Approach			31	2.0	31	2.0	0.016	0.2	NA	0.0	0.0	0.00	0.05	0.00	20.0
All Vehicles			646	3.7	646	3.7	0.291	0.6	NA	0.0	0.0	0.00	0.07	0.00	47.6

MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 1 - 2038 - PM (Site Folder: 2038)]

Network: N101 [PM (Network Folder: 2038)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV] %	Arrival Flows [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Median															
5	T1	All MCs	196	2.0	196	2.0	0.296	4.9	LOS A	1.2	9.2	0.63	0.71	0.74	24.5
Approach			196	2.0	196	2.0	0.296	4.9	LOS A	1.2	9.2	0.63	0.71	0.74	24.5
NorthWest: Road 4															
1	L2	All MCs	117	2.0	117	2.0	0.125	6.0	LOS A	0.5	3.7	0.45	0.63	0.45	42.1
2	T1	All MCs	13	2.0	13	2.0	0.125	9.5	LOS A	0.5	3.7	0.45	0.63	0.45	28.4
Approach			129	2.0	129	2.0	0.125	6.3	LOS A	0.5	3.7	0.45	0.63	0.45	41.7
SouthWest: Eaton Dr															
3	L2	All MCs	41	2.0	41	2.0	0.211	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	47.3
4	T1	All MCs	741	4.0	741	4.0	0.211	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
Approach			782	3.9	782	3.9	0.211	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles			1107	3.3	1107	3.3	0.296	1.8	NA	1.2	9.2	0.16	0.22	0.18	47.6

MOVEMENT SUMMARY

Site: [Eaton Dr & Road 4 - Stage 2 - 2038 - PM (Site Folder: 2038)]

Network: N101 [PM (Network Folder: 2038)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV] %	Arrival Flows [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
NorthEast: Eaton Dr															
2	T1	All MCs	741	4.0	741	4.0	0.399	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
3	R2	All MCs	195	2.0	195	2.0	0.121	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	44.5
Approach			936	3.6	936	3.6	0.399	1.1	NA	0.0	0.0	0.00	0.11	0.00	49.1
NorthWest: Median															
1	R2	All MCs	13	2.0	13	2.0	0.006	0.2	LOS A	0.0	0.0	0.00	0.05	0.00	20.0
Approach			13	2.0	13	2.0	0.006	0.2	NA	0.0	0.0	0.00	0.05	0.00	20.0
All Vehicles			948	3.6	948	3.6	0.399	1.1	NA	0.0	0.0	0.00	0.11	0.00	48.5