AMENDMENT NO. 1

TO THE

PLANNING UNIT C
KEARSLEY ROAD

AGREED STRUCTURE PLAN NO. 1

21 June 2022 - Attachment 9.1.2a

This Amendment to the Agreed Structure Plan has been prepared under the provisions of the Shire of Denmark Town Planning Scheme No. 3

This Structure Plan Amendment is prepared under the provisions of the Shire of Denmark Town Planning Scheme No.3.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN AMENDMENT NO. 1 TO THE PLANNING UNIT C KEARSLEY ROAD AGREED STRUCTURE PLAN NO. 1

WAS APPROVED BY

RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON

……

Signed for and on behalf of the Western Australian Planning Commission

…….

an officer of the Commission duly authorised by the Commission pursuant to section 24 of the *Planning and Development Act 2005* for that purpose, in the presence of:

……. Witness

…….. Date

…….. Date of Expiry

RECORD OF AMENDMENTS MADE TO THE PLANNING UNIT C KEARSLEY ROAD

AGREED STRUCTURE PLAN NO. 1

Amendment No.	Summary of the Amendment	Date approved by WAPC

AMENDMENT NO. 1 TO THE

PLANNING UNIT C KEARLSELY ROAD AGREED STRUCTURE PLAN NO.1

The Shire of Denmark, pursuant to its Town Planning Scheme No. 3, hereby recommends to the Western Australian Planning Commission to approve the above-mentioned amendment by:

1. *Amending the Planning Unit C Kearsley Road Structure Plan Map to reflect a design change for Lot 349 and a small portion of Lot 9000, both on Kearsley Road, Denmark.*

TABLE OF CONTENTS

PART ONE: IMPLEMENTATION

1.0 STRUCTURE PLAN AREA

The Planning Unit C Kearsley Road Structure Plan area applies to Lots 9000, 349 and 350 Kearsley Road, Denmark. This Structure Plan Amendment relates to Lot 349 and a portion of Lot 9000 Kearsley Road (the site).

This Amendment encompasses a design change to the Structure Plan and relates to the site only. A detailed plan illustrating the design change to the Structure Plan is identified in **Figure 1**. This figure forms the Structure Plan Amendment over the site.

2.0 STAGING

The site will be developed in three stages. Stage 1 will comprise the construction of Kearsley Road and the lots that address it. Stage 2 will comprise the central internal north south aligned road, the southern drainage reserve and lots addressing it. Stage 3 will comprise the balance subdivision area.

The provision of any necessary drainage infrastructure will be determined at the time of subdivision.

As identified on the Structure Plan Map, a 4 metre wide section of the eastern boundary of Lot 349, running adjacent to Kearsley Road, will be ceded to the Crown free of cost for the purpose of road widening. This road widening is required to facilitate Water Corporation's water reticulation infrastructure.

Power and water provision will be provided to the development at the time of development.

The provision of the necessary public open space will be provided as per WAPC requirements at the time of subdivision.

3.0 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

3.1 Land Use Permissibility

Land use permissibility within the Structure Plan area shall be in accordance with the Shire of Denmark's Town Planning Scheme No. 3 (TPS3) zoning of the site.

All future subdivision of the site shall be in accordance with the design change forming this application.

LEGEND

APPLICATION AREA

EXISTING TREES AS PER SURVEYOR PICK UP

McLEAN ROAD

KEARSLEY ROAD

347

9000

999

369

2

352

1

4.3031ha

349

12.315 ha

1

14

1063

15

351

350

350

350

WATER CORPORATION EASEMENT

Drainage 1078m²

18m ROAD RESERVE

18m ROAD RESERVE

18m ROAD RESERVE

18m ROAD RESERVE

4m ROAD WIDENING

STRATEGIC FIREBREAK

2 1882m²
3 1500m²
4 1519m²
5 1546m²
6 1546m²
7 1546m²
8 1514m²
9 1507m²
10 1514m²
11 1514m²
12 1507m²
13 1519m²
14 1546m²
15 1546m²
16 1546m²
17 1509m²
18 1500m²
19 2144m²
20 1556m²
21 1516m²
22 1505m²
23 1511m²
24 1556m²
25 1556m²
26 1555m²
27 1533m²
28 1516m²
29 1514m²
30 1536m²
31 1554m²
32 1554m²
33 1546m²
34 1509m²
35 1511m²
36 1526m²
37 1745m²
38 1294m²
39 1132m²
40 1192m²
Drainage 3097m²

PLANNING UNIT C - KEARSLEY ROAD STRUCTURE PLAN

STRUCTURE PLAN MAP

LOT 349 AND A PORTION OF LOT 9000 KEARSLEY ROAD

FIGURE 1

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 27 JULY 2021 | ref - 20-001-001Bii

scale - 1:2000 @ A3

N

0m 20m

3.2 Hazards and Separation Areas

Any future dwelling(s)/structures located on lots identified within the Bushfire Prone Area of the Bushfire Management Plan (BMP- refer **Appendix A**) will require a Bushfire Attack Level assessment to be undertaken at the development application stage.

At the time of development application suitable buffers/separation from existing remnant vegetation will be considered.

3.3 Environmental Features

A detailed flora and vegetation assessment was undertaken for the site on the 15 October 2020 (refer **Appendix B**). Key findings from the assessment determined the following:

- There are no threatened or priority species on the site.
- There are two vegetation types, Karri and Tingle.
- The vegetation is in excellent condition.
- The vegetation is not a threatened or priority ecological community.

4.0 OTHER REQUIREMENTS

4.1 Bushfire Management Plan

This Structure Plan Amendment is supported by a BMP prepared by Working on Fire Planning, contained in **Appendix A**.

The approach for the BMP to support the Structure Plan Amendment is as follows:

- A BAL Assessment has been undertaken to determine predicated radiant heat flux level on the site and proposed building envelope areas.
- Assessment against the Acceptable Solutions and Performance Principles in State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7).

These items aid in planning with consideration of bushfire risk at the structure planning level. Further assessments will be undertaken for subsequent stages and can be prepared as addendums to the existing BMP or as an amended BMP.

PART 2 - EXPLANATORY REPORT

AMENDMENT NO.1 TO THE

PLANNING UNIT C KEARSLEY ROAD AGREED STRUCTURE PLAN NO. 1

PART TWO: EXPLANATORY REPORT

1.0 PLANNING BACKGROUND

1.1 Introduction and Purpose

This Structure Plan Amendment has been prepared in accordance with Schedule 2 Part 4 of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

The purpose of the Structure Plan Amendment is to facilitate a design change over the site. In accordance with the current design (refer **Figure 2**), the majority of the site is identified for the development of Residential Lots with a density code of R10. A portion of the site comprising remnant native vegetation is identified as Special Residential 13 under TPS3.

Based on the subdivision application lodged with the WAPC- Reference Number 157677 (refer **Appendix C**), it was determined by Planning Officer's of the Department of Planning, Lands and Heritage, the development of the Residential R10 lots with a minimum lot size of 875m^2 is too constrained for the site given the following:

- The design will make the requirements of 2015 State Planning Policy 3.7- Planning in Bushfire Prone Areas (SPP 3.7) difficult to implement on site.
- There is no "hard edge" (i.e. a constructed road) between the western most lots and adjacent bushland.
- A large portion of the site has a gradient between 15-20% and in excess of 20%. Resultant from this, there will potentially be the need for significant earthworks and the construction of retaining walls on the smaller lots. These site works are not in keeping with the subdivision vernacular within the Shire of Denmark.
- The "smaller" 1,000m^2 lots will be subject to overshadowing resultant from retaining walls and retention of remnant vegetation (where possible).

These site constraints with the underlay of the Structure Plan Map are illustrated in **Figure 3.**

As identified in **Figure 1**, the design change provides for 39 lots with an average lot size of approximately 1,500m^2, the provision of Public Open Space within remnant native vegetation and two drainage reserves. It is noted, the current Structure Plan lot yield for the site is 43 lots, which includes two lots comprising the remnant native vegetation.

The design change, through the provision of 39 larger lots as opposed to the current approved Structure Plan, meets the above-mentioned constraints and facilitates a superior outcome for the development of the site, as follows:

- As evidenced in the BMP, the design change enables the requirements of SPP 3.7 to be adhered to.

LEGEND

APPLICATION AREA

McLEAN ROAD

CRESCENT

PASHLEY

KEARSLEY

401 2464m²
402 2001m²
403 2003m²
404 2001m²
405 2566m²
406 2479m²
EXISTING LOT 407 4402m²
408 2399m²
409 9090m²
410 4796m²
411 4499m²
412 4104m²
413 3311m²
414 2569m²
415 2000m²
416 2005m²
417 2010m²
418 2050m²
419 2050m²
420 2010m²
421 2003m²
422 2008m²
423 2003m²
424 2002m²
425 2010m²
426 2001m²
427 2001m²
428 2000m²
429 2000m²
430 2000m²
431 2282m²

EXISTING WATERCORP SITE

LOT 2

9.1401ha

(16m ROAD RESERVE)

(16m ROAD RESERVE)

BALANCE LOT 9000

0.7114ha

18m RD RES

EASEMENT

WATER CORPORATION

Drainage 2103m²

3.8714ha

48 3.2713ha

18m ROAD RESERVE

KEARSLEY ROAD 100.22

32 1233m²
33 943m²
34 947m²
35 937m²
36 1064m²
37
38 1708m²
39 1750m²
40 1750m²
41 1729m²
42 1751m²
43 1705m²
44 1775m²
45 1646m²
46 1685m²
47 1727m²
51 919m²
52 893m²
53 924m²
54 977m²
55 975m²
56 974m²
57 938m²
58 875m²
59 876m²
60 878m²
61 886m²
62 875m²
63 1063m²
64 1161m²
65 1130m²
66 1073m²
67 1146m²
68 1203m²
69 1200m²
70 1193m²
71 1185m²
72 1134m²
73 1144m²
74 1079m²
Drainage 1175m²
49 901m²
50 921m²

15m

369 999 1063 350

PLANNING UNIT C - KEARSLEY ROAD STRUCTURE PLAN

DESIGN IN ACCORDANCE WITH CURRENT STRUCTURE PLAN

LOT 349 AND A PORTION OF LOT 9000 KEARSLEY ROAD

FIGURE 2

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 8 Feb 2021 | ref - 20-001-005

scale - 1:2000 @ A3

N

0m 20m

LEGEND

APPLICATION AREA

BAL29 OR GREATER

REMNANT VEGETATION

SLOPE >20%

SLOPE 15-20%

347

McLEAN ROAD

999

9000

2

Drainage 1078m²

18m ROAD RESERVE

EASEMENT

KEARSLEY ROAD

369

4m ROAD WIDENING

352

349 12.315 ha

18m ROAD RESERVE

STRATEGIC FIREBREAK

Drainage 3097m²

18m ROAD RESERVE

350

351

PLANNING UNIT C - KEARSLEY ROAD STRUCTURE PLAN

OPPORTUNITIES AND CONSTRAINTS PLAN

LOT 349 AND A PORTION OF LOT 9000 KEARSLEY ROAD

FIGURE 3

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 27 JULY 2021 | ref - 20-001-006C
scale - 1:2000 @ A3

N

0m 20m

- Given the size of the larger lots, the change in gradient can be absorbed within the lots without the need for retaining walls on the property boundaries. This will result in less visual impact and a development more in keeping with the style of development traditionally undertaken in Denmark.
- Given the depth and width of the larger lots, future house sites can be sited to minimise overshadowing from other future dwellings and remnant vegetation. The shadow diagram- refer **Figure 4**, illustrates the shadow future dwellings will have on select lots. The shadow diagram was prepared to reflect the winter sun on June the 21st at midday.
- The provision of the western, north south aligned road provides a "hard edge" interface between the remnant vegetation and the proposed Residential lots. This interface provides:
    - Greater fire protection to the proposed lots adjacent to the remnant vegetation.
    - Ease of access for the Shire of Denmark to manage and maintain the Public Open Space/bushland.
- The additional north south road provides for greater connectivity within the subdivision, without impacting on any Threatened or Priority Ecological Communities.

1.2 Land Description

The area of Lot 349 comprises 12.315 hectares and the portion of Lot 9000 included in this Amendment comprises circa 5,000m^2, with the lots legally described in **Table 1**.

1.2.1 Location

The site is located within the Shire of Denmark local government area and obtains legal road frontage from Kearsley Road. The site is located approximately 1.5kms north west of the Denmark CBD.

The southern boundary of the site abuts Lot 350 Kearsley Road and the northern boundary Lot 9000 Kearsley Road (Lots 350 and 9000 are identified as Planning Unit C- Kearsley Road Structure Plan). A reserve for Parks and Recreation and Rural zoned land are located to the west and Special Residential and Residential land with a density code of R2 is to the east.

LEGEND

APPLICATION AREA

EXISTING TREES AS PER SURVEYOR PICK UP

OVERSHADOWING EXTENT

INDICATIVE SETBACK LINE

INDICATIVE FFL

STRATEGIC FIREBREAK

4m ROAD WIDENING

McLEAN ROAD

KEARSLEY ROAD

18m ROAD RESERVE

Drainage 1078m²

Drainage 3097m²

WATER CORPORATION EASEMENT

1 4.3031ha

349 12.315ha

347 352 351 350 369 999 9000 1 14 15 1063

PLANNING UNIT C - KEARSLEY ROAD STRUCTURE PLAN

STRUCTURE PLAN MAP - INDICATIVE OVERSHADOWING DIAGRAM (LOTS 2-5)

LOT 349 AND A PORTION OF LOT 9000 KEARSLEY ROAD

FIGURE 4

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 29 OCT 2021 | ref - 20-001-001Biii

scale - 1:2000 @ A3

N

0m 20m

1.2.2 Area and Land Use

The site has been cleared in parts for residential/tourist accommodation purposes and animal grazing, with the balance comprising remnant native vegetation.

1.2.3 Legal Description and Ownership

A copy of the Certificates of Title is included within **Appendix D.**

TABLE 1 – LEGAL SITE DESCRIPTION & CURRENT OWNERSHIP

Lot No.	Plan Number	Volume/Folio	Primary Interest Holder
349	230731	1797/438	Sunland Pty Ltd
9000	77503	2834/927	P. Robertson

2.0 PLANNING FRAMEWORK

2.1 Zoning and Reserves

2.1.1 Shire of Denmark Town Planning Scheme No.3.

The site has a split zoning of Residential with a density coding of R10 and Special Residential under the Shire of Denmark's TPS3. This zoning was facilitated via an Amendment to TPS 3. This split coding will be rectified post the Structure Planning process.

As part of the TPS3 Amendment, a Local Structure Plan was prepared for the site, which is reflected in the Planning Unit C Kearsley Road Structure Plan.

2.2 Planning Strategies

2.2.1 Shire of Denmark Local Planning Strategy (2011)

The site is identified within the Shire of Denmark's 2011 Local Planning Strategy (LPS) as being within Planning Unit C- Kearsley Road Structure Plan. This makes allowance for the provision of 84 Urban Residential Lots.

Within the LPS, there are 1,306 Urban Residential lots identified within the Urban Residential Expansion Area.

In considering the site constraints, the design change comprising this Amendment will not adversely impact the forecast number of lots in the LPS for the site.

2.3 Planning Policies

2.3.1 State and Strategic Policies

State Planning Policy No. 3.7: Planning in Bushfire Prone Areas

SPP 3.7 Planning in Bushfire Prone Areas (2015) is used to assist in reducing the risk of bushfire to people, property and infrastructure by encouraging a conservative approach to strategic planning, subdivision, development and other planning decisions proposed in bushfire prone areas.

Planning for Bush Fire Risk Management Guidelines have also been prepared and are designed to supplement the objectives and policy measures established in SPP 3.7, to assist in their interpretation and provide advice on how bushfire risk is to be addressed when designing or assessing a proposal within a bushfire-prone area.

A BMP has been provided within **Appendix A** and demonstrates compliance with SPP 3.7.

Government Sewerage Policy (2019)

This policy establishes the Western Australian Government's position on the provision of reticulated sewerage in the State for the rezoning, structure planning, subdivision and development of land.

Relevant to this Structure Plan, the following policy objectives are identified:

- To protect public health and amenity;
- To protect the environment and the State's water and land resources;
- To promote the efficient use of infrastructure and urban land;
- To minimise costs to the broader community by ensuring an appropriate level and form of sewerage servicing is provided.

Based on the requirement to connect to reticulated sewerage, the ultimate subdivision of the site will see all lots connected to the Water Corporation's reticulated sewerage network.

2.4 Pre-lodgement Consultation

Consultation has been undertaken with the Department of Planning Lands and Heritage (DPLH) and the Shire of Denmark administration (the Shire), with the following agreed outcomes:

- The subdivision application (WAPC Reference Number 157677- Refer **Appendix C**) lodged over Lot 349 in accordance with the Structure Plan cannot be supported, given the clearing required to address bushfire constraints and the gradient.
- In meeting the constraints, a Structure Plan Amendment was prepared and lodged with the DPLH (refer **Appendix E**). In reviewing the Structure Plan Amendment, it was considered the lots proposed were too large and not "in-keeping" with the general intent of the area.
- Based on the decision not to support the previous Structure Plan Amendment, a meeting was held with the DPLH and the Shire. At this meeting a draft plan, which reflects the current Structure Plan Amendment was presented. In-principle support was provided for the draft plan, subject to the following:
    - The preparation of a BMP and BAL Contour Mapping.
    - A detailed spring Flora and Fauna Assessment.
    - The requirements of the Government Sewerage Policy being addressed.
    - Impacts on the loss of Urban Residential Land.

  These items have been addressed accordingly in this document.

3.0 SITE CONDITIONS AND CONSTRAINTS

The Structure Plan amendment is underpinned and informed by the following site specific technical assessments:

- Bushfire Management Plan prepared by Working on Fire Planning
- Flora and Vegetation Survey prepared by PGV Environmental
- Engineering infrastructure report prepared by TABEC civil Engineering Consultants

3.1 Biodiversity and Natural Area Assets

PGV Environmental undertook a detailed flora and vegetation assessment for the site on the 15 October 2020 (refer **Appendix B**). Key findings from the assessment determined the following:

- There are no threatened or priority species on the site.
- There are two vegetation types, Karri and Tingle.
- The vegetation is in excellent condition.
- The vegetation is not a threatened or priority ecological community.

Vegetation removal was considered acceptable to enable the approval of the previous application. This proposal requires the clearing of additional vegetation. The removal of additional vegetation provides improved bushfire mitigation for future residential lots and the general locality.

Furthermore, this proposal makes allowance for the retention of 4.7ha of native remnant vegetation, which will be ceded to the Crown free of cost at the time of subdivision application.

3.2 Bushfire Hazard

As mentioned in Part 1, a BMP has been prepared by Working on Fire Planning for the site- refer **Appendix A**.

The BMP confirms the Structure Plan design achieves the Acceptable Solutions and Performance Principles of SPP 3.7, namely as follows:

- All of the proposed lots can achieve a suitable BAL rating of 29 or less. For lots that comprise native vegetation there will be some on-site clearing at the time of subdivision civil works to enable dwelling construction. The clearing, as confirmed by the environmental consultant's previous assessment, will not have a significantly detrimental impact on the site's environmental features.
- Where required, to meet Asset Protection Zone (APZ) guidelines as per SPP 3.7, at the time of subdivisional works, the developer will undertake select clearing to achieve a suitable BAL for development within the lots.
- Development of the site meets the requirements for two access routes.

- Each dwelling will have access to a reticulated water supply.

The BMP outlines responsibilities for implementing a fire risk strategy prior to, during and post subdivision.

3.3 Context and Other Land Use Constraints and Opportunities

The most significant land use constraints impacting the site are the gradient and remnant native vegetation, as follows:

Gradient

As illustrated by **Figure 3**, a large portion of the site has a gradient between 15-20% and in excess of 20%. This gradient, with the development of "traditional" 800m^2 lots, will result in significant earthworks and the construction of retaining walls.

The design change accommodates the steep gradient through the provision of an average lot size of 1,500m^2.

Water Corporation Easement

The Water Corporation's potable water storage tank for the Denmark Townsite is located to the north west of the site. A water supply line runs through the southern portion of Lot 9000 and the northern and eastern boundary of Lot 349. In accommodating the supply line and associated easement, the design change makes allowance for the following:

- The north western drainage reserve, which will be located on the parent title of Lot 9000, accommodates the easement. This ensures the easement will have minimal impact of the development potential of the proposed residential lots, whilst ensuring the Water Corporation's access to their infrastructure.
- As identified by the Structure Plan Map (refer **Figure 1**), Kearsley Road reserve will be widened 4m to the west. This widening allows for the Water Corporation's easement to be located in a road reserve as opposed to private property. The identified Kearsley Road widening will be ceded to the Crown free of cost at the time of subdivision.

Southern Lot

Lot 350 Kearsley Road, which forms part of the original Structure Plan, is located immediately south of the site. The Structure Plan amendment will not have any impact on the development potential of Lot 350.

4.0 STRUCTURE PLAN AMENDMENT – INPUTS AND RATIONALE

This Structure Plan Amendment is an amendment to the existing Kearsley Road Structure Plan dated August 2010 (refer to **Figure 2**). The existing Structure Plan (2010) design was informed by various technical assessments, including (but not

limited to) a Land Capability Assessment, Flora and Fauna Assessment, Local Water Management Strategy (LWMS), Bushfire Management Plan and Traffic Impact Assessment.

The existing Land Capability Assessment, LWMS and other technical assessments remain valid documents underpinning the Structure Plan amendment. Updates have been undertaken to the relevant technical assessments, where required, to support and guide the Structure Plan amendment, including a Flora and Vegetation report, Engineering Services Report and Bushfire Management Plan.

The existing and updated technical assessments ensure the Structure Plan amendment conforms to both current planning policy and the principles of orderly and proper planning. In addition, they expand upon technical assessments underpinning the current Structure Plan, to ensure the environmental and engineering constraints associated with the site can be suitably managed.

Key changes and updated technical assessments informing the Structure Plan amendment are discussed in the following sections.

4.1 ROAD NETWORK

A key change to the Structure Plan amendment is a departure from a main boulevard road pattern and inclusion of a secondary road further to the west. The main boulevard identified on the existing Kearsley Road Structure Plan (2010) has been realigned to utilise the existing Kearsley Road reserve and support suitable lot sizes and dimensions.

The removal of the boulevard adjacent to the site has been managed to ensure minimal impact on remnant vegetation, as follows:

- The construction of the Kearsley Road carriageway within the cleared eastern portion of Kearsley Road reserve, which currently comprises a gravel access track.
- Where applicable, the provision of shared crossovers from lots 29 to 37 to Kearsley Road carriageway. The crossovers have been located to minimise impact on remnant significant trees within the Kearsley Road reserve, as identified within **Figure 5**. The shared crossovers will be constructed by the developer at the time of subdivision construction.

Inclusion of a secondary road further to the west provides a physical hard edge, which clearly demarcates the residential lots from the remnant vegetation. This also provides direct frontage to a public road for proposed Lots 2 to 10. In addition, as per SPP 3.7 Bush Fire Risk Management Guidelines, the secondary road also functions as a buffer to remnant vegetation to the west, ensuring that all lots are able to achieve an acceptable BAL rating.

PLANNING UNIT C - KEARSLEY ROAD STRUCTURE PLAN

CROSS OVER DESIGN LOCATIONS

LOT 349 AND A PORTION OF LOT 9000 KEARSLEY ROAD

FIGURE 5

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date - 27 JULY 2021 | ref - 20-001-008

scale - 1:1000 @ A3

Where possible, significant trees will be retained within the road reserves to minimise potential environmental impacts and provide increased visual amenity. All proposed roads incorporate an 18-metre road reserve (with a 6 metre wide asphalt seal and kerbing) to allow sufficient space to accommodate reticulated water, power, sewerage, footpaths and drainage infrastructure, as confirmed in the Infrastructure Report (**Appendix F**).

Pruning and modifications to the understorey vegetation within the Kearsley Road reserves will be required for bushfire purposes and to ensure appropriate sightlines are provided for safe vehicle movements. This will be undertaken by the developer at the time of construction. Post development works, future maintenance will be undertaken by the adjoining landowners through licences issued under the Local Law for Public Thoroughfare.

The road network is informed by an Infrastructure Report (**Appendix F**), which includes a Road Grade Plan, confirming all access roads can achieve a maximum 15% grade in accordance with the Shire of Denmark Guidelines for Development and Subdivision.

The road network can be fully developed and constructed, independently of Lot 350 to the south, by offsetting the alignment of the southern access to Kearsley Road within the 18m wide road reserve. Importantly, consideration has been provided to the revised road network to ensure an appropriate interface is provided to future stages of development to the north, south and east of the site.

4.2 LOT SIZES, LAYOUT AND ENVIRONMENT

The below table provides a summary of the lot yield and average lot sizes provided for under the existing Kearsley Road Structure Plan (2010), and those proposed within this Structure Plan amendment.

	Existing Structure Plan (2010)	Structure Plan Amendment
Residential lot yield	41	39
Average lot size	1,192m2	Circa 1,500m2
Large vegetated residential lot yield	2	0
Large vegetated residential average lot size	3.6 Ha	N/A
Drainage lots	2	2

As previously discussed, Planning Officers of the Department of Planning, Lands and Heritage identified a number of issues with the lot sizes identified within the existing Kersley Road Structure Plan (2010). The key issues identified are detailed in Part 2, section 1.1 of this report.

The revised lot layout and lot sizes achieve a better overall outcome for the site, without unduly impacting on the lot yield planned for the locality. This ensures that future subdivision and development of the site provides for the efficient use of the land holding(s), whilst addressing opportunities and constraints associated with the sites topographical values.

Further, the Structure Plan amendment provides a lot layout and lot size enabling the land to be subdivided and developed in the future without the need for significant earthworks associated with the existing Structure Plan design. This has been achieved by increasing the lot widths to achieve a layout that works with the natural topography of the site and minimises the potential for any retaining walls. This will also assist with improved visual amenity in the locality.

In addition, the Structure Plan amendment provides a lot pattern and design (i.e., 30m wide lots and 50m deep) that supports increased slope to separate future dwellings from existing vegetation and at the same time reducing potential overshadowing associated with the existing Structure Plan (2010)- Refer **Figure 4** Shadow Diagram. This is particularly relevant given the south facing aspect of the site.

Although there is a greater impact on the site's existing vegetation associated with the Structure Plan amendment, primarily due to the inclusion of the secondary road to the west and wider lots to minimise overshadowing, the revised lot pattern achieves a better overall balance between future development and the environment. This includes the majority of remnant vegetation contained within a single lot, which will be retained as Public Open Space. This will assist with protecting the vegetation in perpetuity from clearing, spread of dieback and weed intrusion, which the current Structure Plan (2010) does not provide.

The Flora and Vegetation Report (Appendix B) confirms that the site contains no Threatened or Priority Ecological Communities. Furthermore, *"Development of the site in accordance with the Amended Structure Plan would result in the retention of a large portion of the Karri/Tingle Forrest in the western POS Reserve lot and potential retention of some trees on the on the smaller eastern lots adjacent to Kearsley Road. Retention of a large proportion of the vegetation in the western lot would retain the ecological function of the vegetation adjacent to the Nature Reserve and other nearby areas of vegetation."*

Accordingly, environmental values associated with the Structure Plan amendment can be retained and/or improved upon, without unduly impacting on the environmental values of the locality.

5.0 LAND USE AND SUBDIVISION REQUIREMENTS

Based on the zoning of the site, which provides a relatively low density coding, the development will not facilitate vast areas of conventional residential housing. Noting the site conditions and features, the design change of the Structure Plan has been able to positively respond to the landform and visual attributes.

All future subdivision and development of the site will be in accordance with the Structure Plan Amendment. The use classes defining development of the land will be as per the underlying TPS3 zoning (i.e. Special Residential and Residential R10). As this Structure Plan amendment proposes a change to the location of the currently zoned Residential R10 and Special Residential land, it is understood the Shire of Denmark, as part of their Town Planning Scheme review process, will amend the underlying zoning (i.e. the identified Lots 2-40 will ultimately be zoned Residential R10). Alternatively, the zoning may be normalised through a basic amendment process, following the final approval of the Structure Plan.

5.1 Infrastructure Coordination and Servicing and Staging

The site can be serviced by all necessary infrastructure, which is covered in detail in the appended Infrastructure Report- refer **Appendix F**. A summary of the servicing provision is provided as follows:

5.1.1 Electricity

There is an existing power supply with sufficient capacity within the locality of the site.

At the time of subdivisional works all underground power infrastructure will be installed within the proposed Kearsley Road reserve alignment.

5.1.2 Telecommunications

At the time of development an application will be submitted to NBN whereby they will determine the technology most appropriate for servicing the subdivision

5.1.3 Gas

There is no gas supply to Denmark. Gas supply to the development will be provided via bottled gas.

5.1.4 Water

The site will be serviced by the Water Corporation's water supply, which is located upslope of the site.

5.1.5 Waste Water

The site will be serviced by the Water Corporation's waste water supply, which is located downslope of the site.

5.1.5 Drainage

In accordance with the Structure Plan amendment, a stormwater model has been undertaken by the hyrdologst Hyd20 Hydrology (refer **Appendix G**). The modelling confirms the area requirement for drainage, which can be accommodated in the south- eastern portion of the site. In addition to this, the specified outflow requirements have been established.

The design of the drainage and requirements for off-site flowpaths downstream of the development will be undertaken at the design stage of subdivision.

5.1.6 Roads

The development will be internally serviced by 18m constructed road reserves, as identified in the infrastructure report.

Kearsley Road will be constructed from the intersection of Wishart Place to the northern boundary of the lots comprising the site area. The required carriageway

and select infrastructure will be located within the existing Kearsley Road Reserve. A 4m road widening of Kearsley Road is also proposed to accommodate the Water Corporation's existing water infrastructure (refer Section 3.3 of this report).

6.0 CONCLUSION

This Structure Plan Amendment has been prepared to facilitate a design change over Lot 349 Kearsley Road and a portion of Lot 9000, Denmark within the Planning Unit C Kearsley Road Structure Plan. The design change results in a subdivision layout, which provides for a site responsive design.

The Structure Plan Amendment has been prepared within the context of the various WAPC and Shire of Denmark guiding planning documents.

Further, this Structure Plan amendment addresses and overcomes a number of concerns raised by the DPLH planning officers, including the following:

- This Structure Plan amendment provides for larger lot sizes, which minimise the potential requirement for boundary retaining walls, i.e., the fall in gradient between lots can be accommodated within the wider lot dimensions.
- This Structure Plan amendment reduces the potential for overshadowing to occur, via the provision of larger lot sizes and greater lot widths. This is particularly important given the southerly aspect of the site and a key consideration raised by planning officers at the Department of Planning, Lands and Heritage.
- By working with the natural topography in the development design and subsequently providing for passive solar housing development, the relevant objectives of the Residential Design Codes and Liveable Neighbourhoods are being addressed in this Structure Plan amendment.
- Environmental values of the site will be suitably managed, with this Structure Plan amendment having no impact on Threatened or Priority Ecological Communities in the locality. The design provides for the retention of a large portion of the remnant vegetation within a future Public Open Space reserve and provides increased protection from clearing, weed infestation and the spread of dieback. This is something the existing Structure Plan does not provide for.
- Inclusion of a secondary road to the west provides a hard edge, separating the lots from adjacent vegetation. This clear boundary demarcates urban development from the surrounding natural environment, whilst providing a buffer to ensure all lots are able to achieve a suitable BAL rating. Further, this also provides convenient access for the Shire to maintain the future Public Open Space reserve.
- This Structure Plan amendment considers other areas included within the current Structure Plan area and provides a suitable interface to ensure that all lots within the Structure Plan area will be developed independently of each other. Importantly, vehicle access will be provided from the site to

both the north and south connections with Kearsley Road independently of the adjoining land holdings.

- This Structure Plan amendment ensures that the site is used in an efficient manner, with consideration to topographic and environmental constraints associated with the site, and effectively delivers upon the lot density and yields planned for the locality.

Overall, noting the existing approved Structure Plan, the site's context and location and the conclusions of the supporting technical documents, this Structure Plan provides an improved planning outcome for the site and the locality.

Appendix A- Bushfire Management Plan

WORKING ON FIRE PLANNING

BUSHFIRE MANAGEMENT PLAN
Lot 349 Kearsley Road,
MT SHADFORTH

CLIENT:	Graeme Robertson
SITE LOCATION:	Lot 349 Kearsley Road, Mount Shadforth, WA 6333
DATE:	20/02/2021
SHIRE/CITY:	Shire of Denmark
FIRE CONSULTANT:	Craig Hughes, David Deeley
CLIENT CONTACT #	0429 919 998
WOFP FILE #:	20200120
VERSION #:	3.0

WORKING ON FIRE PLANNING
INTEGRATED FIRE MANAGEMENT
Working On Fire Planning Pty Ltd
ABN: 42 623 954 316
PO Box 1249 Bibra Lake DC WA 6965
planning.australia@workingonfire.com
www.workingonfireplanning.com.au

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lot 349 Kearsley Road, Mt Shadforth, WA 6333

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 21th Month February Year 2020

Report author or reviewer: Craig Hughes and David Deeley

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☑ Level 3 practitioner ☐

If accredited please provide the following.

BPAD accreditation number: 37575 Accreditation expiry: Month September Year 2021

Bushfire management plan version number: V3.0

Bushfire management plan date: Day 20th Month February Year 2021

Client/business name: Graeme Robertson

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		✓
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		✓

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✓
Strategic planning proposal (including rezoning applications)		✓
High risk land-use		✓
Vulnerable land-use		✓

None of the above ☑

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 20/02/2021

Table of contents

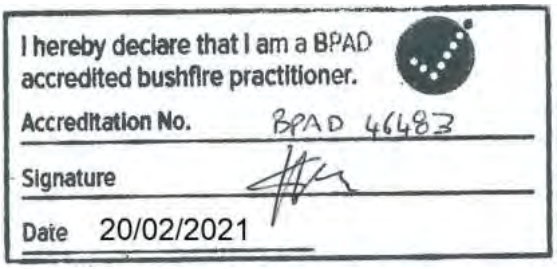
List of figures

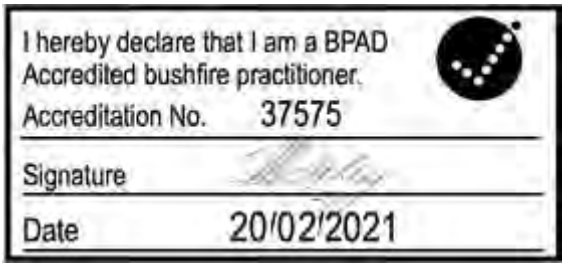
List of appendices

Document control

Client: Graeme Robertson

Report version	Purpose	Author/reviewer and accreditation details	Date submitted
Draft 1.0	BMP	Peter Bidwell	24/02/2020
Submission Draft 1.0	BMP – Review & sign off	David Deeley L2	26/2/2020
Revised 2.0	BMP	Craig Hughes L1	15/01/2021
Submission 2.0	BMP – Review & sign off	David Deeley L2	28/01/2021
Revised 3.0	BMP	Craig Hughes L1	20/02/2021
Submission 3.0	BMP – Review & sign off	David Deeley L2	20/02/2021





Disclaimer

The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959 – Building in Bushfire prone Areas, WAPC / DFES Guidelines for Building in Bushfire Prone areas (State Planning Policy 3.7) and CSIRO's research into Bushfire behaviour. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.

Section 1: Proposal details

The proposal is to amend the structure plan for Lot 349, Mt Shadforth. This proposal will facilitate the subdivision of the lot (12.31 hectares) to produce 40 Lots ranging from 1,507 m^2 to 4.74 Hectares.

The WAPC have previously approved subdivisions over the site to reflect the current Structure Plan. The applicant recently lodged a subdivision application renewal over the site. Upon receipt of this, given the site constraints and revision to Planning Policies, the WAPC advised the site can no longer be developed in accordance with the current previously-approved, Structure Plan. The proposed lot layout (Figure 1) reflects the design changes required to meet the site constraints and revision to Planning Policies.

The land slopes (Figure 2) from 154 m in elevation at the northern western corner in a south easterly direction to 68 m in the south east corner. Lot 349 is cleared pasture with remnant natural vegetation on the eastern half, whilst the western half is totally forested (Figure 3). The forest is generally tall Karris with a range of tree species including Marri and some Yellow Tingle, along the northern boundary.

Surrounding land use is a mix of grazing pastures, rural residential development, small areas of horticulture and larger uncleared forest remnants to the northwest and southwest.

This BMP document and the recommendations contained within it are aligned to the following:

- Consistency with SPP 3.7 and the planning requirements for Local Government;
- Identification of bushfire risks using vegetation types and slopes as in AS3959 – 2018;
- Identification of assets at risk- life, property, infrastructure and the environment;
- Identification of bushfire risk mitigation measures as acceptable solutions within SPP 3.7;
- Allocation of responsibilities to persons / entities for the implementation of recommendations and management measures;
- Compliance with the current Shire of Denmark's "Firebreak & Fuel Hazard Reduction Notice".

Figure 1 Proposed subdivision plan.

Location, Lots and Ground Contours (DAFWA 2m)

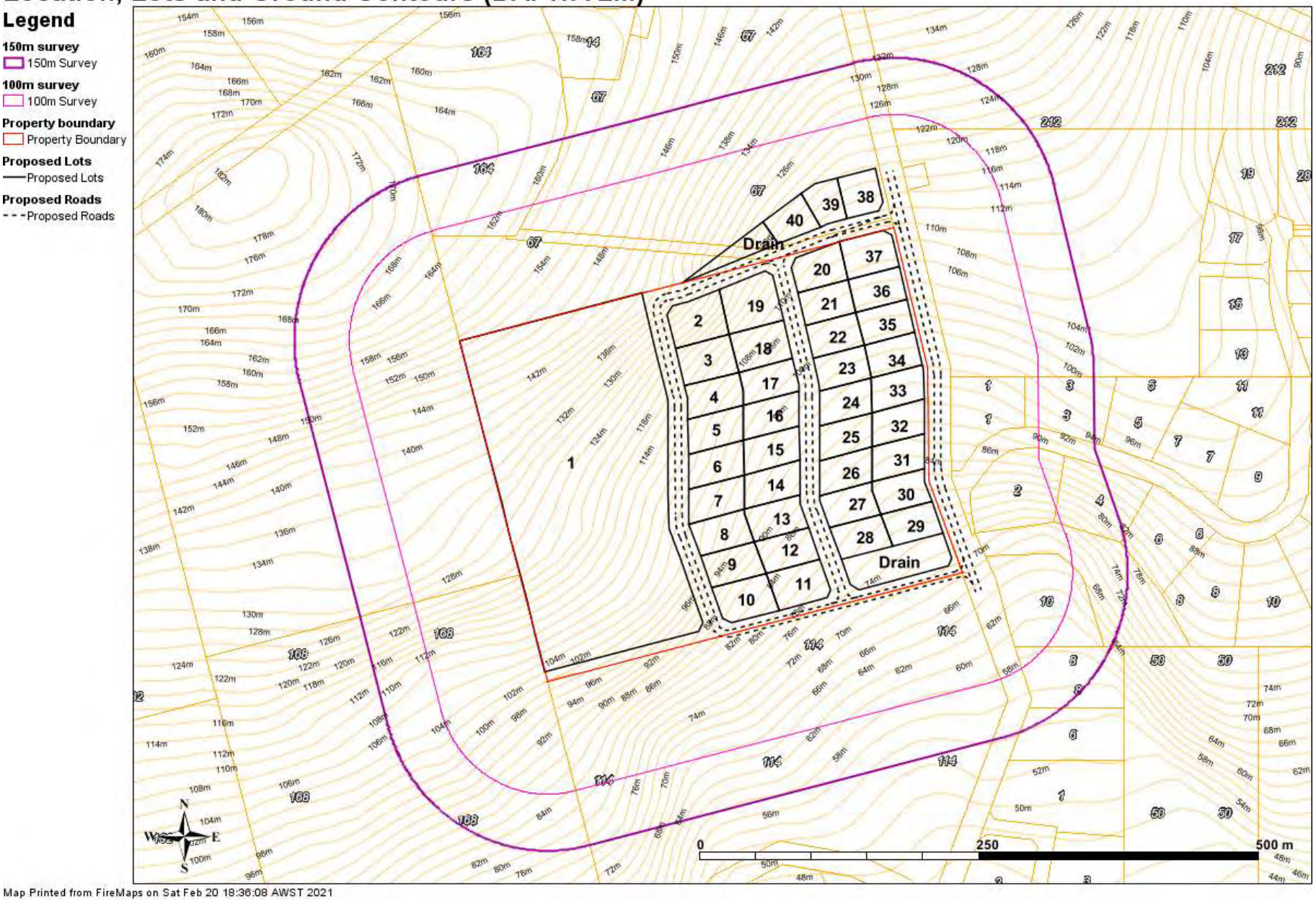


Figure 2 Location, Lot layout and ground contours (Landgate 5m).

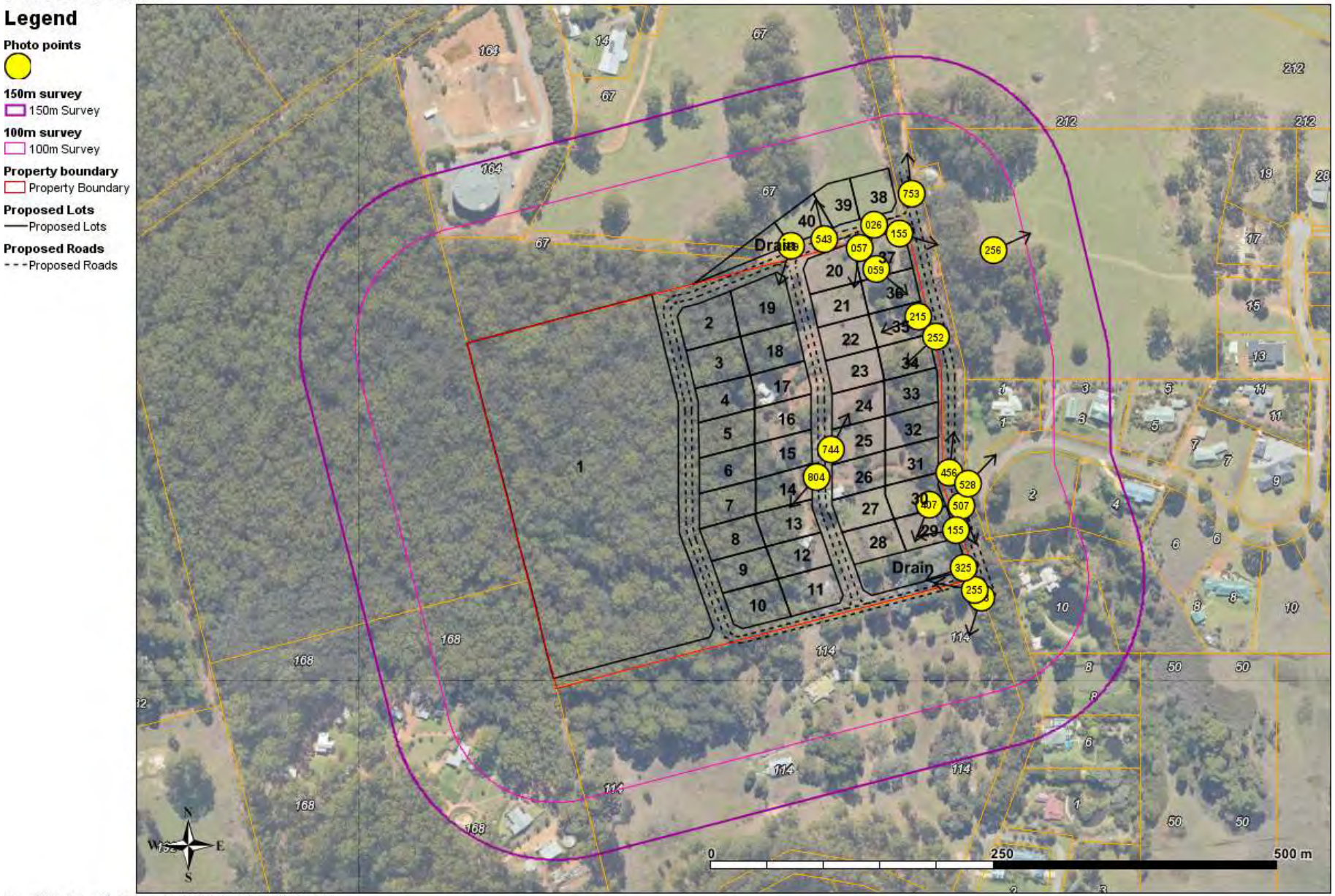


Figure 3 Air photo, Photo assessment points

Section 2: Environmental considerations

Some bushfire prone areas also have high biodiversity values. State Planning Policy 3.7 (SPP3.7) policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.

Sub-section 2.1: Native vegetation – modification and clearing

The area including the property and a 150 m survey area surrounding Lots 349, retains some stands of native vegetation representative of the following Beard vegetation associations by IBRA 7.1 subregion:

(IBRA Subregion(Code) : Beard Association - approximate area in hectares):

- Warren(WAR01) : 1 : Tall forest; karri (Eucalyptus diversicolor) – 21.50 ha

This selected area is within the following IBRA 7.1 Sub-regions.

- Region / Sub-region(Sub-region code) : Warren / Warren(WAR01) – 40.69 ha

The selected area retains native vegetation representative of the following vegetation complexes (approximate area in hectares):

- Keystone, Kb (g) 21.50 ha

There are no known environmental considerations at this site as the lot is mostly cleared where the majority of the lots will be created. ≤4 hectares of native vegetation clearing / mitigation is proposed along the proposed road reserve and subject lots to achieve a rating of ≤BAL-29 to the lots, consistent with SPP3.7.

Sub-section 2.2: Revegetation/Landscape plans

There is no revegetation required or planned for this site. Lots when they are created and made available for sale will require a Section 70A notice on their titles, indicating that they are within a 'bushfire prone area' and that they are subject to this BMP and its requirements for APZs to be maintained as per Schedule 1 (see Appendix 1), in perpetuity.

Section 3: Bushfire assessment results

Sub-section 3.1: Assessment inputs

Photo points were established across the site (Figure 3). All existing vegetation within 150 m of the Subject Site was classified (Figure 4), according to the requirements of AS3959:2018.

Two (3) types of Classified vegetation were recorded:

1) Tall Open Forest on the western half of Lot 349 (Photos 539, 804, 744, 059, 155 and 325), plus remnant patches on the eastern half. Lot 9000 is predominantly sown pasture with small sections of Tall Open Forest and forest to the north (Photos 543), plus a strip along Kearsley Road (Photos 753, 456 and 507);
2) Sown pasture across the main development site and surrounding the Lots to the East and South (Photos 057, 059, 256, 215, 407, 155 and 248);
3) Excluded 2.2.3.2f Vegetation regarded as low threat due to factors such as flammability, moisture content and fuel load are found surrounding to the East and South West as developed residential areas (Photo 528).

Sub-section 3.2: Assessment outputs

Vegetation proposed after development and implementation of APZs and clearing of the road alignment for Kearsley Road running along the eastern boundary plus the internal roads is presented in Figure 5.

A BAL contour analysis is presented based on the proposed vegetation after development (Figure 6), with the Grassland across the development site to be maintained by the developer at <100 mm, according to the specifications of Schedule 1 (Appendix 1), until Lots are sold. After that time, the provisions of the Shire's annual fire management notice will ensure that potential bushfire threats are managed.

Close-up BAL contours after development are presented for the north (Figure 7) and south (Figure 8) of the development. The Western Side lots will require some removal of vegetation to achieve a BAL-29 rating. This clearing will be dependent on the proposed siting of buildings on the lot by the purchasers. Every endeavour must be made to retain as many trees as possible.

Please note: *Indicative BAL ratings presented here are not the final BAL ratings for each proposed dwelling within the development. A detailed and individual site assessment may need to be undertaken by an accredited bushfire practitioner once final lot layouts, vegetation maintenance treatments, building envelope location and building geometry have been determined.*

Classified Vegetation - Existing

Figure 4 Vegetation existing classified (as per AS3959:2018).

Classified Vegetation - After Development

Map Printed from FireMaps on Sat Feb 20 20:10:56 AWST 2021

Figure 5 Vegetation after development, classified (as per AS3959:2018).

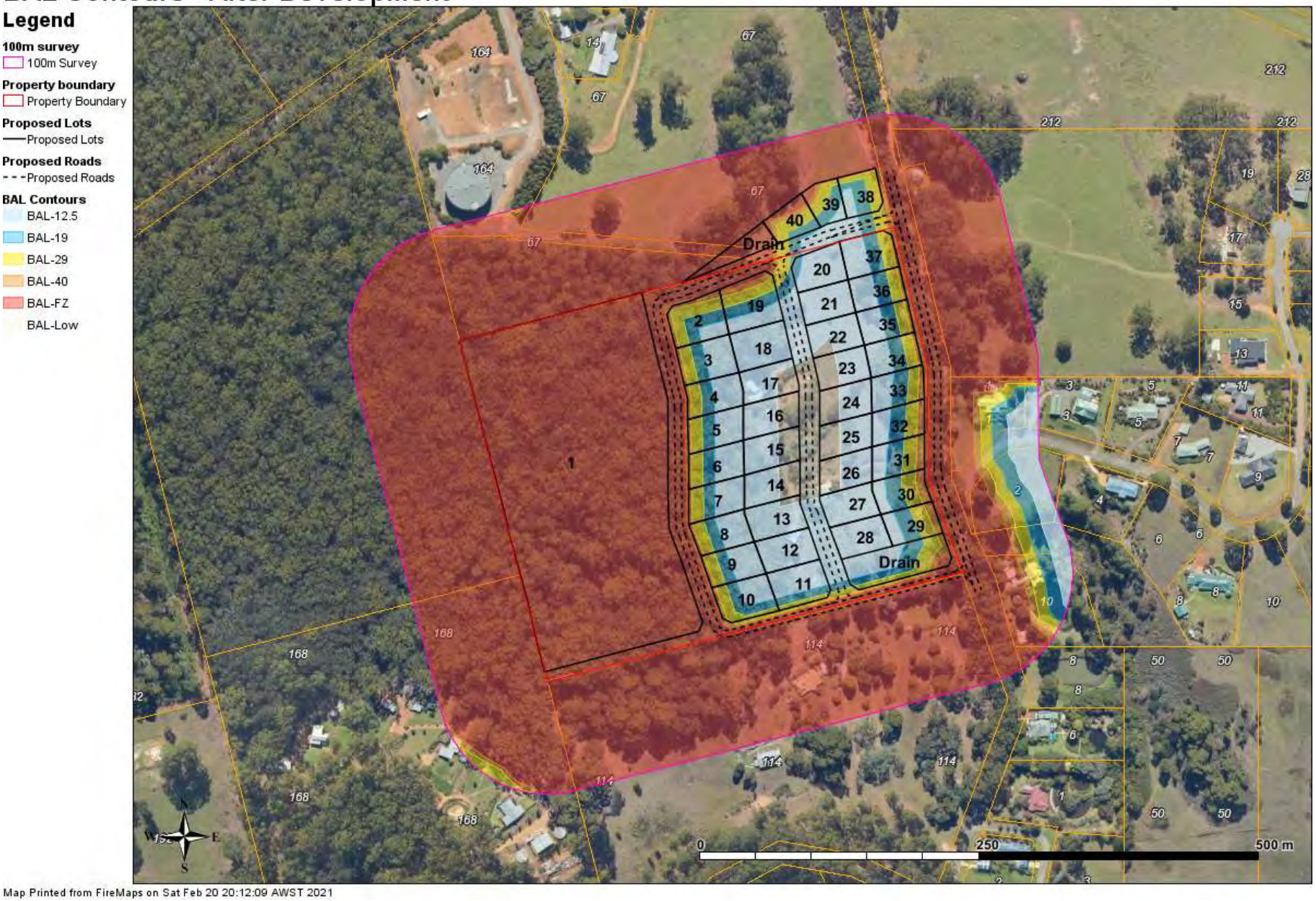


Figure 6 BAL contours after establishment of the APZs to ≤BAL-29.

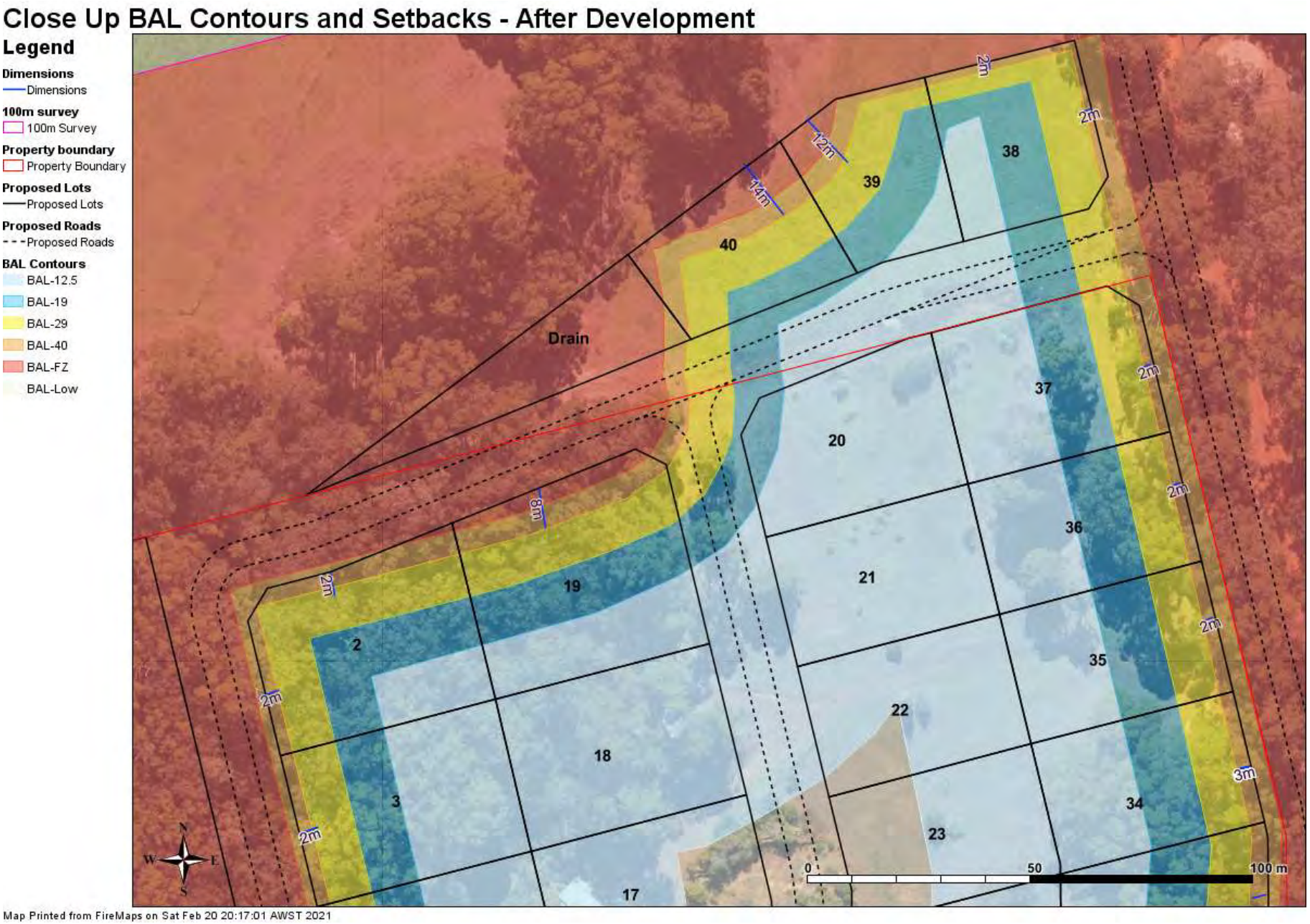


Figure 7 BAL contours for the northern section.

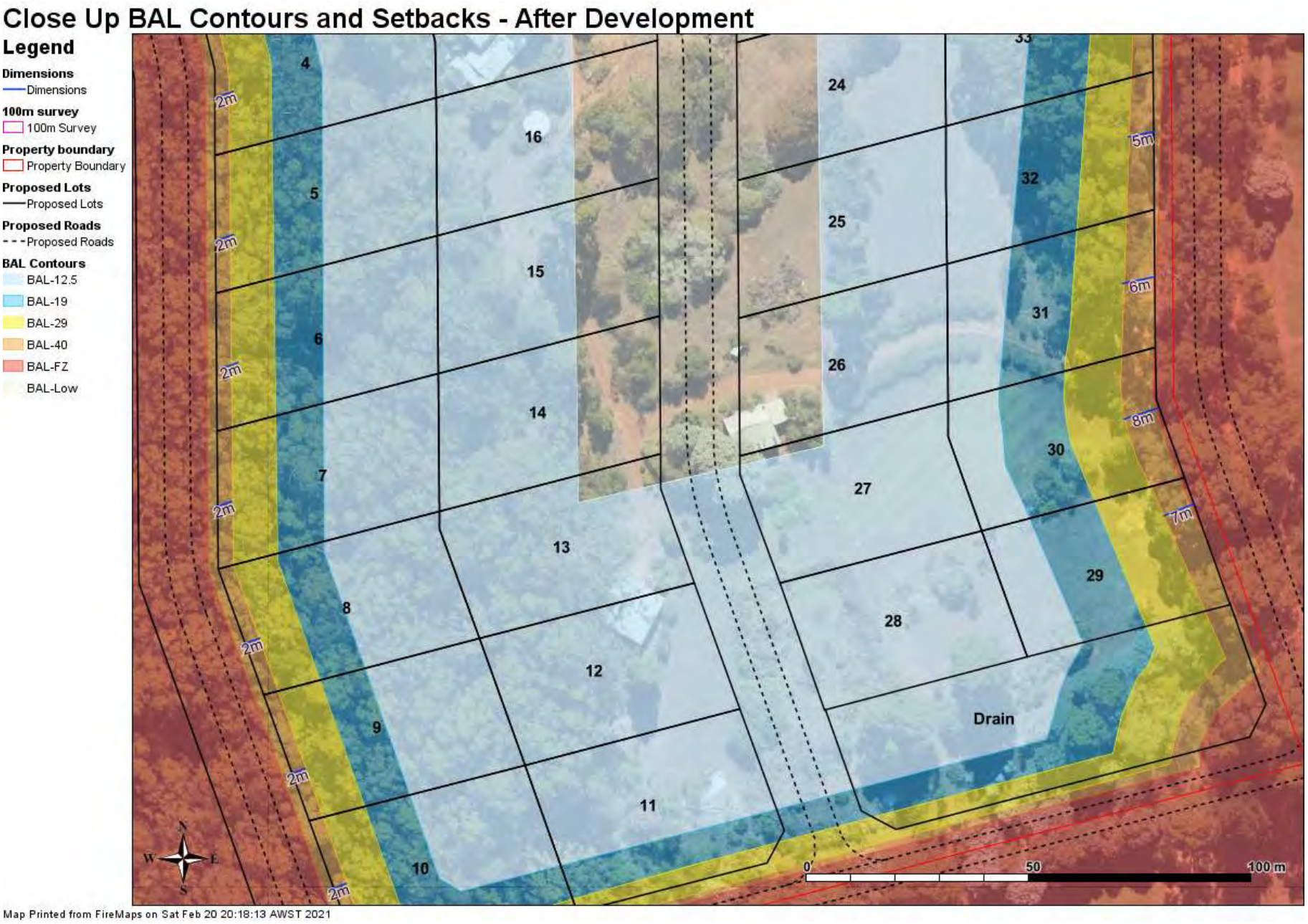


Figure 8 BAL contours for the southern section.

Section 4: Identification of bushfire hazard issues

The site is predominantly sown pasture with some remnant Karri vegetation plus a pristine section of Karri, Redgum and Yellow Tingle forest on the western half of Lot 349. The sown pasture areas on both lots have been well maintained by the owner through mechanical slashing and more recently by heavy grazing in some areas.

The remnant Karris are significant landscape features within the Shire of Denmark and negotiations have resulted in them being retained in most part by sensitive lot layout and design and through implementing APZ requirements which require management of understorey vegetation where canopy density is <10% cover. Fuel reduction will be implemented around isolated remnant Karri forest s through mechanical means and/or carefully-controlled prescribed burning.

The implementation and maintenance of APZs to manage fuel loads under the retained Karris and for grassland areas across the development site will need to be made conditional on approval to ensure the specifications of Schedule 1 are maintained in perpetuity.

Table 1 BAL ratings and setback distances to achieve them for all lots in the development.

Lot Number	BAL Rating With Setback	Setback Distance m	Comments
2-10	BAL-29	2	Potential for BAL-19 with additional setback
11	BAL-19	4	Potential for BAL-12.5 with additional setback
12-18	BAL-12.5	N/A	
19	BAL-29	8	Potential for BAL-19 with additional setback
20	BAL-19	N/A	Potential for BAL-12.5 with additional setback
21-28	BAL-12.5	N/A	
29	BAL-29	7	
30	BAL-29	8	
31	BAL-29	6	
32	BAL-29	5	
33-34	BAL-29	3	
35-37	BAL-29	2	Potential for BAL-19 with additional setback
38	BAL-29	2	
49	BAL-29	12	
40	BAL-29	14	

Section 5: Assessment against the bushfire protection criteria

Section 5.1: Bushfire Protection Criteria

Element 1 Location

The Mount Shadforth area is 2 km to the north of the Denmark Central Business District. It is an area that has traditionally been zoned rural and used to produce high quality grazing pastures and a range of horticultural crops. The area is responding to pressure for additional residential lots close to Denmark that provide expansive view-scapes and a rural-residential lifestyle. Mount Shadforth is currently undergoing a transition and areas are being rezoned rural residential, with developments offering lots of around 1500 m^2 as part of the peri-urban fringe.

The proposed development is to convert the 12.32 ha of Lot 349 into 39 lots of from 1,398 m^2 to 4.74 hectares. The subdivision layout has been designed to minimise vegetation clearing (≤4 ha) and optimise Lot yield, while meeting the requirements of SPP3.7's bushfire management considerations.

After development, it is intended that Kearsley Road will be upgraded to service this and other developments in the area. The proposed public road network associated with the development and the wider locality will provide dual egress options to two separate destinations for the development.

Each of the proposed Lots will have sufficient room for setbacks from classified vegetation so that all future dwellings can be constructed to ≤BAL-29.

The development will be provided with a reticulated water supply in accordance with the specifications of the WA Water Authority and the Department of Fire and Emergency Services.

The acceptable solutions described below demonstrate that due consideration has been given to the landscape-scale bushfire protection criteria embodied within Element A1.1. The proposed solution meets the intent of Element A1.1.

Element 2 Siting and Design of Development

The development has large areas of sown pasture. Further clearing of some native vegetation is required to achieve a rating of ≤BAL-29 for all lots, except lot 1 which is to retain all of its original vegetation (Appendix 4). Each building on lots 2-40, can be sighted such that the APZ to ≤BAL-29 can be maintained by mowing or grazing to the standard specified in Schedule 1 (see Appendix 2). This solution meets the requirements of Element A2.1.

Element 3 Access

3.1 Two different vehicular access routes are available, connecting to public roads. Kearsley Road presently connects to Lantzke Road and Redman Road to Scotsdale Road. Kearsley Road also connects to Mt. Shadforth Road to the South. The proposed public road network associated with the development and the wider locality will provide dual egress options to two separate destinations for the development.

3.2 All public roads within and surrounding the development, will be constructed to the standards set out in State

Planning Policy 3.7, and specified in Table 2 column 1.

3.3 N/A No cul-de-sac's are proposed for this development.

3.4 N/A No Battle-axe lots are proposed for this development.

3.5 N/A No private driveways will be longer than 50 m within this development.

3.6 N/A No Emergency access way are proposed for this development. The existing and proposed public road network associated with this development will provide adequate access/egress in a bushfire emergency.

3.7 N/A No additional fire service access or perimeter roads are proposed for this development. The existing and proposed public road network associated with this development, will provide adequate access/egress for fire services in a bushfire emergency.

3.8 Lots 2 – 41 are <0.5 ha, so perimeter firebreaks are not required for these. Lot 1 which is proposed to have all its original vegetation retained, is greater than 0.5 hectares and a perimeter firebreak will be installed and managed for this lot, as per the Shire of Denmark Fire and hazard reduction notice.

Element 4 Water

Intent:

A4.1 Reticulated areas

The subdivision, development or land use is to be provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.

A4.2 N/A

A4.3 N/A.

Section 5.2: Compliance table

Table 1 Compliance table for bushfire protection criteria.

Bushfire protection criteria	Method of compliance Acceptable solutions	Proposed bushfire management strategies
Element 1: Location	A1.1 Development location The proposed residential development is in a location previously approved for that purpose by the WAPC and the Shire of Denmark. It will on completion, achieve a rating of ≤BAL-29 for all residential lots. **This meets the intent of Element A1.1.**	The proposed development will require clearing and fuel load reductions along the road reserve (Kearsley Road) during establishment, in order to achieve a rating of ≤BAL-29 for each developable lot. After hand over, the Shire has indicated that it will maintain the road reserve in perpetuity at a low-threat status (Schedule 1), commensurate with the determined BAL ratings.
Element 2: Siting and design	A2.1 Asset Protection Zone APZs within each lot as per the Shire's annual fuel load reduction notice, will be implemented to control grassland fuel loads across the development site and achieve ratings of ≤BAL-29 for all developable lots. **This meets the intent of Element A2.1.**	The proposed development will have established and maintained APZs around all future dwellings to Schedule 1 specifications and in accordance with the Shire of Denmark's annual Fire Management Notice.
Element 3: Vehicular access	A3.1 Two access routes. The existing and proposed public road network provides for egress via two access routes leading to two different destinations (Figure 9). **This meets the intent of Element A3.1**	Dual egress options will be available via Kearsley Road connecting to Scotsdale Road to the north and Mt Shadforth Road to the south (Figure 9).
	A3.2 Public road. Public roads within and surrounding the development will be built to the specifications of Table 2 column 1. **This meets the intent of Element A3.2.**	All public roads in proposed development will be built to required technical standards as per Appendix 2: *Table 6- Vehicle access technical requirements.*
	A3.3 Cul-de-sac (including a dead-end-road) **N/A**	No cul-de-sacs are proposed for this development.

Bushfire protection criteria	Method of compliance Acceptable solutions	Proposed bushfire management strategies
Element 3: Vehicular access	A3.4 Battle-axe Lots **N/A**	No Battle-axe Lots proposed for this development.
	A3.5 Private driveway longer than 50 metres. **N/A**	No private driveway 'longer than 50 metres' planned in the proposed development.
	A3.6 Emergency access way **N/A**	No emergency access way planned in the proposed development.
	A3.7 Fire service access routes (perimeter roads) **N/A**	No additional fire service access routes (perimeter roads) planned in the proposed development.
	A3.8 Firebreak width. Lots 2 – 40 are <0.5 ha and no perimeter firebreak is required. Lot 1 is >0.5 ha will have a perimeter firebreak established. **This meets the intent of Element 4.1.**	A perimeter firebreak will be installed and maintained around lot 1, in accordance with the Shire of Denmark's Annual Firebreak Notice.
Element 4: Water	A4.1 Reticulated areas The development is to be provided with a reticulated water supply consistent with the requirements of the local water utility and DFES. **This meets the intent of Element 4.1.**	The proposed development will have established reticulated scheme water supplied in accordance with the Water Corporation and Department of Fire and Emergency Services specifications. Hydrants will be located in accordance with requirements.
	A4.2 Non-reticulated areas **N/A**	
	A4.3 Individual lots within non-reticulated areas. **N/A**	

Section 6: Photographs

GROUND PHOTO 539

DIRECTION: **SW** PLOT SAMPLE: **9**

Class A Forest – Western Section of Lot 349

GROUND PHOTO 543

DIRECTION: **N** PLOT SAMPLE: **1**

Class G Grassland with Class A Forest in background – Lot 9000

GROUND PHOTO 057

DIRECTION: **S** PLOT SAMPLE: **1**

Class G Grassland – Managed Sown Pasture on Lot 349

GROUND PHOTO 026

DIRECTION: **S** PLOT SAMPLE: **1**

Class G Grassland with Class A Forest shown on left – Managed Sown Pasture on Lot 349

GROUND PHOTO 753

DIRECTION: **N** PLOT SAMPLE: **2**

Kearsley Road showing narrow strip of Karri trees along the eastern boundary

GROUND PHOTO 155

DIRECTION: **E** PLOT SAMPLE: **2**

Class A Forest – Tall Open forest of Lot 349 along the eastern boundary

GROUND PHOTO 059

DIRECTION: **SE** PLOT SAMPLE: **2**

Class A Forest – Tall Open forest of Lot 349 along the eastern boundary

GROUND PHOTO 256

DIRECTION: **NE** PLOT SAMPLE: **3**

Class G Grassland – Sown Pasture, Eastern Lot 369

GROUND PHOTO 215

DIRECTION: **W** PLOT SAMPLE: **1**

Class G Grassland – Managed Sown Pasture on Lot 349

GROUND PHOTO 252

DIRECTION: **SW** PLOT SAMPLE: **2**

Class A Forest – Tall Open forest north of Lot 349 along the eastern boundary

GROUND PHOTO 744

DIRECTION: **NE** PLOT SAMPLE: **1**

Class G Grassland – Managed Sown Pasture small areas of retained remnant vegetation in background

GROUND PHOTO 804

DIRECTION: **SW** PLOT SAMPLE: **9**

Class A Forest – Tall Open forest centre of Lot 349

GROUND PHOTO 456

DIRECTION: **N** PLOT SAMPLE: **2**

Kearsley Road showing narrow strip of Karri trees along the eastern boundary

GROUND PHOTO 407

DIRECTION: **S** PLOT SAMPLE: **1**

Class G Grassland with Class A Forest shown in background – Managed Sown Pasture on Lot 349

GROUND PHOTO 528

DIRECTION: **NE** PLOT SAMPLE: **5**

Residential development east of Kearsley Road, along Wishart Place

GROUND PHOTO 507

DIRECTION: **S** PLOT SAMPLE: **2**

Kearsley Road showing narrow strip of Karri trees along the eastern boundary

GROUND PHOTO 155

DIRECTION: **W** PLOT SAMPLE: **1**

Class G Grassland with Class A Forest shown in background – Managed Sown Pasture on Lot 349

GROUND PHOTO 325

DIRECTION: **SW** PLOT SAMPLE: **2**

Class A Forest – view along lot 349 and 350 boundary. Note: single row of managed Pinus on left

GROUND PHOTO 255

DIRECTION: **W** PLOT SAMPLE: **6**

Class G Grassland – Managed sown pasture with few tress on Lot 350

GROUND PHOTO 248

DIRECTION: **W** PLOT SAMPLE: **6**

Class G Grassland – Managed sown pasture with few trees on Lot 350

Section 7: Responsibilities for implementation and management

DEVELOPER – PRIOR TO LOT SALES	
No.	**Implementation action**
1	Fuel reduction and management - Clear and remove (or prescribed burn) those areas of bush proposed in this plan.
2	Provide public roads as per the specifications in Appendix 2 - Table 2 column 1.
3	Provide scheme water supplies as per the Water Corporation's Design Standard 63 – Water reticulation.
4	Provide guidance for Lot purchasers to obtain individual BAL assessments for their proposed building envelopes and dwelling geometries.

DEVELOPER – ONGOING MANAGEMENT PRIOR TO HANDOVER	
No.	**Management action**
1	Maintain low fuel loads within the general sub-division site.
2	Comply with the Shire of Denmark's annual fire management notice issued under S33 of the Bush Fires Act 1954.
3	Maintain vehicular access routes within the lot to the required surface condition and clearances.

LOCAL GOVERNMENT	
No.	**Management action**
1	Ensure that the conditions of subdivision approval enshrine the bushfire management measures
2	Provide annual fire management notices
3	Monitor land owner compliance with regulations
4	Promote education and awareness of bushfire prevention and preparation measures.
5	After hand over to maintain the vegetation along the Kearsley Road reserve in a Low-threat status as per Schedule 1.

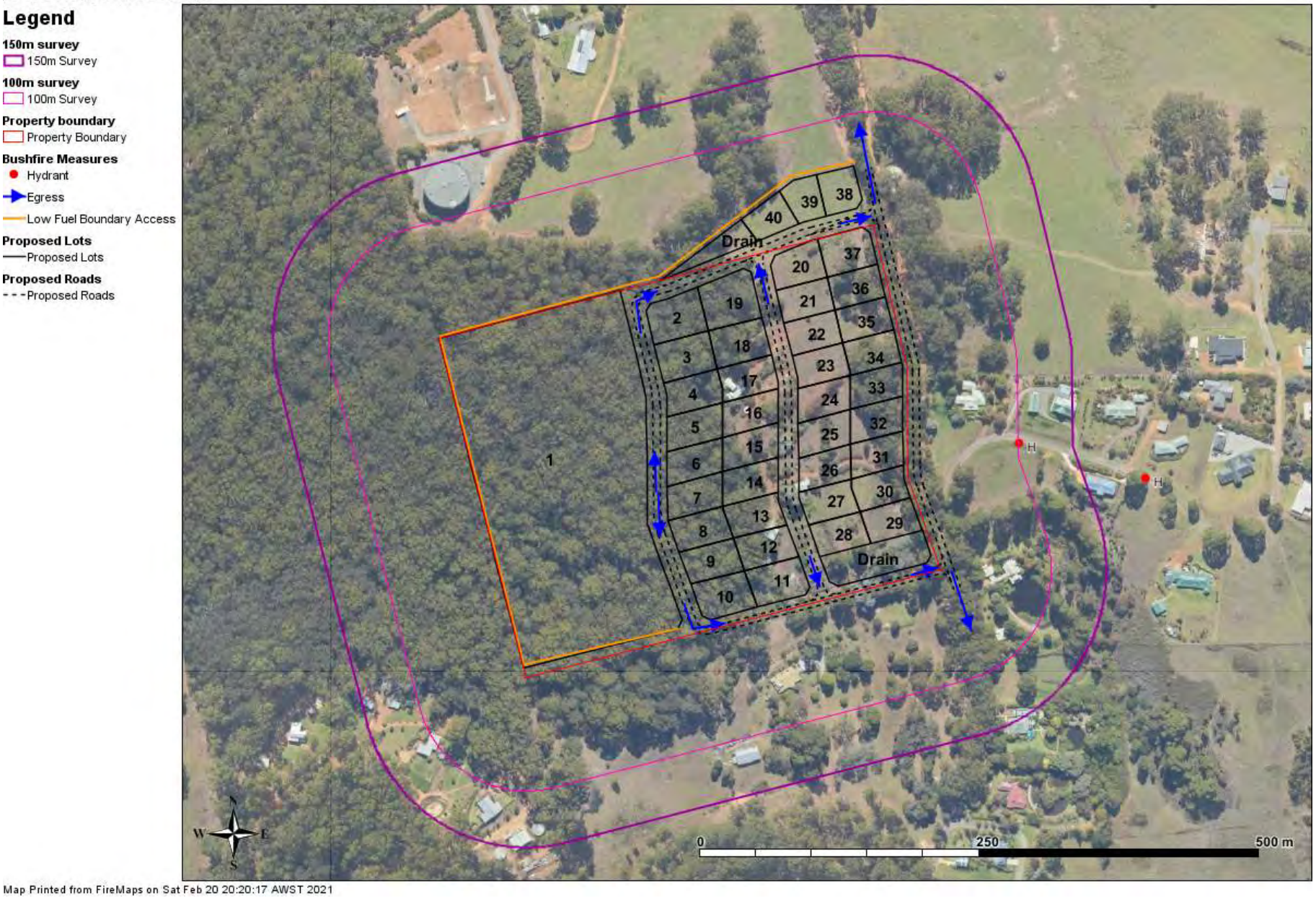


Figure 9 Bushfire Management Measures.

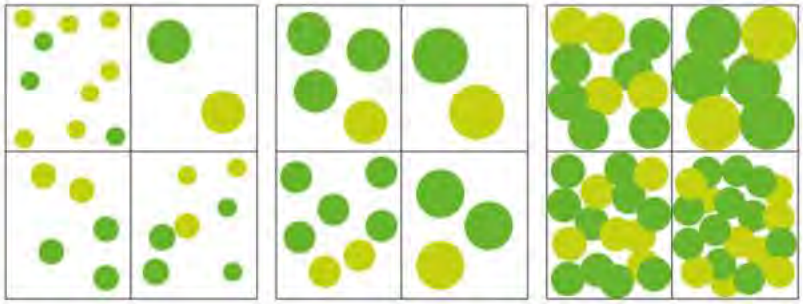
Appendices

Appendix 1: APZ specifications

Schedule 1 – Specifications for Asset Protection zones

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m^2 in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

(Source WAPC Guidelines for planning in bushfire prone areas Version 1.3 Dec 2017 Appendices)

Appendix 2: Vehicle access technical requirements

"Table 6"- Vehicle access technical requirements.

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
*Refer to E3.2 Public roads: Trafficable surface					

Appendix 3: Shire of Denmark Fire Management Notice

A current version of the Shire of Denmark Firebreak and Fuel Management Notice can be found online at https://www.denmark.wa.gov.au/residents/local-emergency-management.aspx.

Shire of Denmark
953 South Coast Highway (PO Box 183), Denmark WA 6333
Phone: 9848 0300 • Email: enquiries@denmark.wa.gov.au • Website: www.denmark.wa.gov.au

Shire of Denmark 2019/2020 FIREBREAK AND FUEL MANAGEMENT NOTICE
Section 33 BUSH FIRES ACT 1954

FIRST and FINAL Notice to all owners and/or occupiers of land situated within Shire of Denmark.

As a measure to assist in the control of fires, or preventing the spread or extension of a bush fire, Notice is hereby given to all owners and/or occupiers of land within the Shire of Denmark that pursuant to the powers conferred in Section 33 of the *Bush Fires Act 1954*. Works in accordance with this notice must be carried out before the **1st day of December each year**, or within 14 days of becoming the owner or occupier of land if after this date. All work specified in this Notice is to be maintained up to, and including, the **30th day of April** in the following calendar year.

FIRE PREPAREDNESS AND MITIGATION IS A SHARED RESPONSIBILITY
YOU OWN THE PROPERTY – YOU OWN THE RISK

DEFINITIONS

For the purpose of this Notice the following definitions apply:

Alternative Fire Management Arrangement includes a Variation as defined in Requirement 9 of this Notice, a Bushfire Management Plan, Bushfire Management Statement or Fuel Load Management Plan approved by the Shire of Denmark to reduce and mitigate fire hazards within a particular subdivision, lot or other area of land anywhere in the Shire of Denmark.

Asset Protection Zone (APZ) is a fuel reduced area surrounding a building, or an asset of value, whether residential, commercial, industrial or environmental as outlined in Requirement 8 of this document.

Authorised Officer means an employee of the Shire of Denmark appointed as a Bush Fire Control Officer pursuant to the powers conferred in Section 38 of the *Bush Fires Act 1954*.

***Bush Fire Control* Officer** means an appointed and authorised person under the Bush Fires Act 1954.

Low Fuel Boundary Access (LFBA) means a strip or area of ground, not less than 6 metres wide with 4 metres trafficable and 4.5 metres vertically, as close as practical to inside all external boundaries of any lot situated within Shire of Denmark. It should be constructed to a trafficable surface that is maintained including the pruning and removal of any living or dead trees, scrub or any other material encroaching into the LFBA area. Such LFBA may be constructed by one or more of the following methods: ploughing, cultivating, mulching, raking, burning, chemical spraying or any other method to achieve the required standard as required by an Authorised Officer. LFBA should include passing bays every 100 metres (20 metres long and 6 metres wide) and not terminate or lead to a dead end without provision for egress to a safe place or a cleared turn around of a 10 metre radius.

Fire and Burning Information Booklet is the information booklet included with this Notice that forms part of this Notice.

Flammable Material means any plant, tree, grass, substance, object or material that may, or is likely to catch fire and burn, or any other material deemed by an Authorised Officer to be capable of combustion.

Fuel Depot / Fuel Storage Area means an area of land, a building or structure where fuel, ie (petrol, diesel, kerosene, liquid gas or any other fossil fuel) is kept in any container or manner.

Fuel Load is any combustible material on the property inclusive of, but not limited to, litter, leaves, twigs, trees and bark whether dead or alive, in isolation or clusters that, in the opinion of an Authorised Officer, is likely to fuel a fire. A litter depth of 5mm from the top of the layer to the mineral earth beneath is indicative of approximately 2.5 tonnes per hectare. A litter depth of

15mm from the top of the layer to the mineral earth beneath is indicative of approximately 8 tonnes per hectare. It does not include 'managed vegetation' such as lawns, mulch and gardens that in the opinion of an Authorised Officer does not constitute a fire risk. The Shire of Denmark can provide a booklet on determining fuel load levels which includes a fuel load measurement guide, for your use on request.

Habitable Buildings means a dwelling, workplace, place of gathering or assembly or a building used for the storage or display of goods or produce for sale in accordance with classes 1-9 of the Building Code of Australia. The term habitable building includes attached and adjacent structures like garages, carports, water tanks verandahs or similar roofed structure(s) that are attached to, or are within 6 metres of the dwelling or primary building.

Maintaining Fuel Loads relates to the management of leaf litter and vegetation as described in this Notice. Reducing fuel load levels does not necessarily require the removal of existing natural vegetation. A combination of methods can be utilised including parkland clearing, safe burning, raking, weed removal, pruning, mulching and/or the removal of plant material.

Managed Vegetation includes vegetation that is pruned away from buildings, under pruned to minimise contact with ground fuels and that is kept free of dead suspended matter such as twigs, leaves and bark.

Parkland Cleared means removal of all vegetation understory & grasses, other than 'substantial vegetation' to create a low fuel area.

Standing Bush means all types of forest, bushland, woodland and scrub areas. It is defined to include trees, bushes, plants, stubble, rushes and undergrowth of any kind whatsoever whether dead or alive. Any area of standing bush to be burnt requires a permit from 1st of October to 15th December and 1st March to 30th April.

Substantial Vegetation refers to all types of vegetation, where the diameter of the trunk measured 1 metre above the ground level exceeds 50mm.

Trafficable means to be able to travel from one point to another in a four-wheel drive fire appliance unimpeded on a ploughed, cultivated, mulched or sprayed surface as approved by an Authorised Officer without any obstruction that may hinder such fire appliances. Low Fuel Boundary Access is not to terminate, or lead to a dead end, have tight bends or be without provision for egress to a safe place or a cleared turn around area of not less than a radius of 10 metres.

Vertical Axis means a continuous vertical uninterrupted line at a right angle to the horizontal line of the firebreak to a minimum height of 4.5 metres from the ground.

REQUIREMENTS FOR SPECIFIC LAND CATEGORIES

The specific requirements below relating to land categories within the Shire are to be implemented and maintained to the satisfaction of an Authorised Officer.

1. **Lots zoned Residential, Industrial, Commercial & Professional Office size 2500m2 or less.**
   - Reduce fuel load from the whole of the land such that the fire fuel is maintained to a maximum of 2 tonnes per hectare or;
   - 5 tonnes per hectare for predominately Karri bush areas
   - Isolated trees and managed vegetation may generally be maintained

2. **(A) Lots zoned Residential, Industrial & Commerical size greater than 2500m2.**

Establish and maintain an Asset Protection Zone in line with the requirements of Section 8 of this Notice.

Vehicular access such as driveways within this zone is required to allow for the safe travel of emergency and other vehicles at all times. Minimum standard for this access is a 6 metre horizontal clearance with a 4 metre trafficable surface and 4.5 metre vertical axis, including a suitable turnaround for a large fire appliance a radius of 10 metres.

For the remainder of the land on the lot outside of the Asset Protection Zone:

- Maintain all grass on the land to a height no greater than 10cm
- Maintain a maximum fuel load in natural bush areas of 8 t/ha or 15 t/ha for predominately Karri Bush areas
- Ensure no tree crowns overhang a building
- Prune trees and shrubs, and remove dead flammable material within 2 metres of all buildings
- Ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter

2. **(B) Lots sized greater than 5000m2.**

In addition to the provisions of Requirement 2 (A)

- Establish and maintain Low Fuel Boundary Access with a 6 metre width including a 4 metre trafficable surface and 4.5 metre vertical axis.

NOTE – Where any conditions listed in Requirements 2 (A) or 2 (B) are physically impractical to implement on a lot, the Shire may approve an Alternative Fire Management Arrangement via a Variation to Firebreak and Fuel Management Notice or Bush Fire Management Plan. Applications are available on the Shire of Denmark website.

3. **Land zoned Special Rural, Special Residential, Landscape Protection, Tourist or Rural Multiple Occupancy**

- Comply with specific fire related provisions that relate to the Town Planning Scheme or relevant Bush Fire Management Plan
- Comply with requirements 2 (A) and or 2 (B) as applicable

4. **Rural Land**

Establish and maintain an Asset Protection Zone in line with the requirements of Section 8 of this Notice around all habitable buildings (please consult the Shire for clearing regulations around any other buildings). Open pasture/grassed areas must generally be maintained to a height of not more than 100mm This includes;

- Comply with Vehicular Access as per requirement 2 (A)
- Low Fuel Boundary Access as per requirement 2 (B)
- Open pasture/grassed areas must be managed to reduce fire fuel loads which must be maintained throughout the Restricted and Prohibited Burning Times. If livestock grazing occurs as part of a managed agricultural pursuit at commercial stocking rates as per the Dept of Agriculture & Food guidelines, pasture may exceed 100mm if approved by an Authorised Officer
- Actively managed pastures, forming part of an agricultural pursuit, may exceed a 100mm height if approved by an Authorised Officer
- Bush area exceeding 40ha must be compartmentalised into areas not exceeding 40ha. This access must have a 6 metre width with a 4 metre trafficable surface and 4.5 metre vertical clearance
- Where access is longer than 100 metres passing places should be installed along accesses at a rate of 1 every 100 metres they should be 20 metres long and 6 metres wide. A turnaround point should be installed at a rate of 1 every 500m at a radius of 10 metres

5. **Specific Hazards: Fuel Depot / Fuel Storage Area / Haystacks / Stockpiled Flammable**

Material and Power & Telecommunication Infrastructure

- Remove all flammable material within 10 metres of where fuel drums, fuel ramps or fuel dumps are located and where fuel drums, whether containing fuel or not, are stored
- Install and maintain Low Fuel Zone, 4 metres wide immediately surrounding any haystacks or stockpiled flammable material
- Install and maintain Low Fuel Zone, 1 metre wide immediately surrounding any power infrastructure (domes, poles etc)
- For telecommunications infrastructure contact/consult with the relevant Shire department

6. **Plantations, any area which trees have been planted for commercial purposes**

The Shire of Denmark has adopted the Guidelines for Plantation Fire Protection developed by the Department of Fire and Emergency Services. This requires all plantations in the Shire of Denmark to adhere to these guidelines. Copies are available from the Department of Fire and Emergency Services website or the Shire of Denmark office.

7. **Strategic Fire Access Routes (SFAR)**

Where a Strategic Fire Access Route is located on your property you will be required to install and maintain it to the satisfaction of the Shire. It must be;

- Maintained between 1st December to the 30th April the following year
- Be clear of all obstructions
- Gates must be provided and unlocked between properties where the SFAR is located

8. **Asset (Building) Protection Zone Specification**

The Asset Protection Zone (APZ) for habitable buildings and related structures, as defined within this Notice, must meet the following requirements, unless varied under an approved 'Alternative Fire Management Arrangement' as defined within this Notice. It applies only within the boundaries of the lot on which the habitable building is situated:

- For habitable buildings built to AS3959, the APZ is to be maintained as per the Bushfire Attack Level (BAL) assessment for that specific property. The APZ should, at a minimum, be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/square metre, Bushfire Attack Level (BAL) 29
- For habitable buildings not built to AS3959, the APZ must extend a minimum of 20 metres from the habitable building, attached structures or adjacent structures within 6 metres of the habitable building **Please Note;** this may be dependent upon specific BAL
- On sloping ground the APZ distance shall increase at least 1 metre for every degree in slope on the sides of the habitable building that are exposed to down slope where natural vegetation exists
- APZs predominantly consist of managed vegetation, reticulated lawns, gardens and other non-flammable features
- All grass is maintained to, or under, 100mm
- Fuel loads must be maintained to, or under, 2 tonnes per hectare
- Clear separation distance between adjoining, or nearby, tree crowns and canopies should be greater than 5m apart with a coverage of less than 15% so as not to form a continuous canopy
- A small group of trees within close proximity to one another may be treated as one crown, provided the combined crowns do not exceed the area of a large or mature crown size for that species
- Shrubs 0.5 metres to 5 metres high are not to be planted in groups or under trees within 3 metres of the habitable building must not exceed 5 square metres. There must be a gap of at least three times the height (at maturity) of the shrub away from the habitable building
- Trees over 5 metres high are not to be within 6 metres of a habitable building

- Trees are to be under pruned to at least a height of 2 metres from the ground
- There are no tree crowns or branches hanging over habitable buildings
- Ensure the roof, gutters and walls of all buildings on the land are free of flammable material
- Install paths and non-flammable features immediately adjacent to the habitable building
- Wood piles and flammable materials should be stored a safe distance from habitable buildings

9. Application to vary the above requirements

If it is considered impracticable to implement any of the requirements of this Notice you may apply for a Variation to the Firebreak and Fuel Management Notice. This must be done in writing to the Shire of Denmark by **no later than the 1st day of November** each year seeking permission to implement alternative measures to assist in the control of bush fires, or preventing the spread or extension of a bush fire. If permission is not granted in writing by the Shire of Denmark you must comply with the requirements of this Notice.

10. Additional Works

In addition to the requirements of this Notice, you may be required to carry out further works which are considered necessary by an Authorised Officer and specified by way of a separate written notice. Such notice will forwarded to the address of the owner/s as shown on the Shire of Denmark rates record for the relevant land.

TAKE NOTICE that pursuant to Section 33(4) of the *Bush Fires Act 1954*, where the owner and/ or occupier of land fails or neglects to comply with the requisitions of this Notice within the times specified, the Shire of Denmark may, by its Authorised Officers and with such servants, workmen and contractors, vehicles and machinery as the Authorised Officers deem fit, enter upon the land and carry out the requisitions of this Notice which have not been complied with and pursuant to Section 33(5) of the *Bush Fires Act 1954*, the amount of any costs and expenses incurred may be recovered from you as the owner and/or occupier of the land.

Bush Fires Act Responsibilities and Council Polices.

Bush Fires Act 1954 Section 24F and 24G (Restricted Burning)

BURNING OF GARDEN REFUSE
Shire of Denmark Policy P050101

- No burning of garden refuse is permitted during the restricted burning time (RBT) without a permit
- No burning of garden refuse is permitted throughout the entire prohibited burning time (PBT)
- All garden refuse that is burnt is to be thoroughly dry (not green) so as not to cause a smoke nuisance to neighboring properties.

Bush Fires Act 1954 Section 25 (1a) and (1c)

CAMP AND COOKING FIRES
Shire of Denmark Policy P050102

Pursuant to the powers under Section 25 (1a) of the Bush Fires Act 1954, the Shire of Denmark hereby prohibits the lighting of fires in the open air in its district for the purpose of camping or cooking during the prohibited burning times, unless the fire is:

(A) At a person's home; (A person's permanent home or residence must be a building approved by the Shire.

A temporary shed or caravan or other structure on an otherwise vacant Lot is not classified as a 'permanent home' and the lighting of camping or cooking fires in these situations is Prohibited during the PBT and subject to the issue of a permit during the RBT) or

(B) In an area which –

(i) Is set aside for that purpose by the State Authority or Local Government responsible for the care, control or management of the land; and

(ii) Bears the State Authority's or Local Government's sign denoting that purpose; and

(iii) All combustible material is cleared from within a 5 metre radius of the fire; and

(iv) The fire danger rating of the day indicates less than "Very High"

The fire must be;

- Contained within a purpose-built structure of brick or rocks and mortar, or
- Contained within a purpose-built steel container recognisable as a properly constructed barbecue, or
- Is a sand fire pit structure, suitable for a camp fire or cooking fire, that has a maximum diameter of 1 metre and a minimum depth of 30cm

Approved locations within the Shire of Denmark

Private Land – Riverbend Caravan Park: 40 Riverbend Lane Denmark, Ayr Saileen: 21 Tindale Road Bow Bridge, Boat Harbour Chalets: 171 Boat Harbour Road Parryville.

Public Land – Parry Beach Caravan Park (Shire), Denmark Boating and Angling Club (Parry Beach, Shire), Peaceful Bay Caravan Park (Shire)

Bush Fires Act 1954 Section 28 and 46

Responsibilities to Extinguish Fires

Property Owners/Occupiers of land are reminded that they must have the ability to contain, control and extinguish any fire burning on their land at any time. Where a bush fire is burning that the owner/occupier of the land shall, whether they have lit or caused such a fire to be lit or not, take all possible measures to extinguish a fire. Where a property owner/occupier fails to extinguish the fire, A Bush Fire Control Officer may take all proper measures to extinguish such fire and expenses of that action are recoverable from the relevant owner. The fees associated with fire response are available in the Shire of Denmark's Schedule of Fees and Charges.

A Bush Fire Control Officer may postpone the lighting of any fire at any time or direct that any fire is extinguished if they are of the opinion that if the fire is lit or not extinguished that the fire is in danger of escaping the land.

If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the *Bush Fires Act 1954*.

The **PENALTY FOR FAILING TO COMPLY** with this Notice is a fine not exceeding $5000 and a person in default is also liable, whether prosecuted or not, to pay the costs of performing the work directed by this Notice if it is not carried out by the owner and/or occupier by the date required by this Notice.

By order of the Council.

Shire President

Appendix 4: Proposed Vegetation Modification

Appendix B- Vegetation Assessment

LOT 349 KEARSLEY ROAD, DENMARK

FLORA AND VEGETATION SURVEY

Prepared for:	Graeme Robertson
Report Date:	9 December 2020
Version:	3
Report No.	2020-541

pgv ENVIRONMENTAL

CONTENTS

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1 INTRODUCTION

1.1 Background

Lot 349 Kearsley Road, Denmark (the site) is located in the Shire of Denmark, approximately 1km north-west of the town centre (Figure 1). The site is 12.3146ha in size and is bounded by Kearsley Road and cleared rural lot to the east, rural lots to the north and south and uncleared native vegetation on a private lot and the McLean Road Nature Reserve (R35621) to the west (Figure 2).

The site currently contains three self-contained holiday accommodation units (Bombina Cottages) and associated landscaped areas on the eastern half and native woodland on the western half.

The owners of the site are investigating the potential re-development of the whole site into residential lots. A proposed development plan is shown in Appendix 1. The plan includes 38 residential lots on the eastern half of the site, ranging in size from 1488m^2 to 2145m^2 and one larger lot of 4.7366ha on the western side. The western lot is proposed to be retained as a Public Open Space reserve to retain the existing vegetation. An internal road system provides access to the lots.

PGV Environmental was commissioned by the landowner, Mr Graeme Robertson, to undertake a flora and vegetation survey of the site to assist in determining the ecological values with respect to the potential future development of the site.

1.2 Scope of Works

A Detailed Flora and Vegetation Survey was undertaken in accordance with EPA Technical Guidance *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The survey included the following:

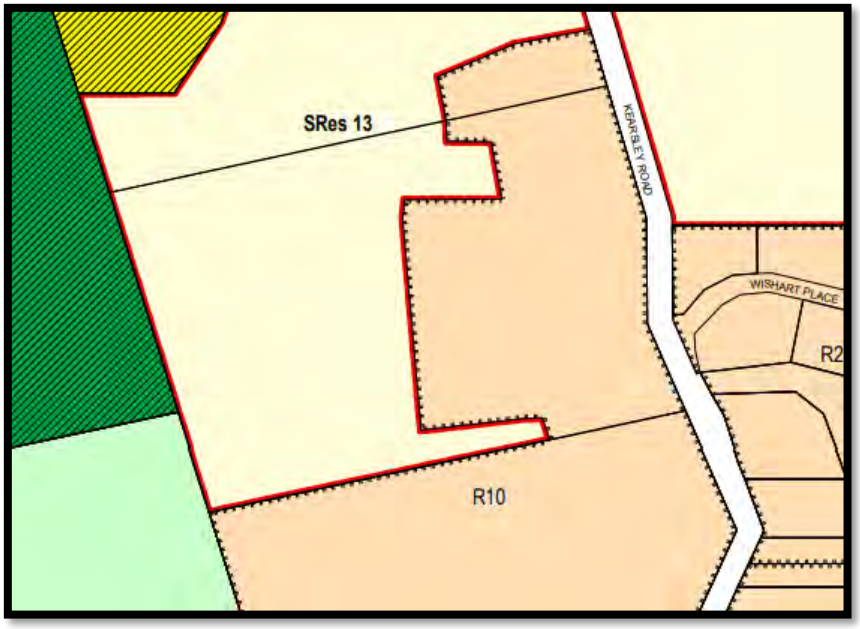
- Desktop search and review of the Department of Biodiversity, Conservation and Attractions (DBCA) Threatened and Priority flora Databases;
- A search of the Naturemap website (DBCA, 2020);
- A search of the Commonwealth Government's Protected Matters Search Tool (DAWE, 2020) to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*;
- Examination of historic and recent aerial photography and contour and soil maps to provisionally identify vegetation types and condition;
- Field survey using quadrats to record native and introduced species as well as a thorough site walkover of any areas of native vegetation;
- Recording of any significant plant species using a hand-held GPS;
- Description and mapping of vegetation types and vegetation condition; and
- Compilation of a flora list.

2 EXISTING ENVIRONMENT

2.1 Land Use

The site is currently zoned 'Special Residential' to the west and 'Residential R10' to the east under the *Shire of Denmark Local Planning Scheme No. 3* (WAPC, 1994).

Plate 1: Zoning



The earliest available historic aerial photograph on-line from 2000 (Landgate, 2020) shows that the site contains native vegetation in the west and is mostly cleared to the east (Plate 2).

Plate 2: Aerial Photograph 2000 (Landgate, 2020)

The site does not appear to have changed substantially from 2000 to 2020 (Figure 2).

2.2 Topography

The site is steeply sloping from the south-east up to the northwest corner with an elevation ranging between 72m AHD at the south-east corner and 153m at the north-west corner (Figure 2).

2.3 Geology and Soils

2.3.1 Geology

The site is located mostly on the Walpole Hills System which are granitic hills and low hills, in the south of the Warren-Denmark Southland and the Broke System in the north-eastern part which are poorly drained plain with low granitic rises, along the coast of the Warren-Denmark Southland (DPIRD, 2020). Sate Regolith maps the site as *Residual or relict material, including ferruginous, siliceous, and calcareous duricrust* (DMIRS, 2020).

2.3.2 Soils

The soils on the site are described as Keystone Brown Duplex Phase (254WhKYb) which are brown gravelly duplex soils and red of yellow earths with much laterite typically associated with Marri-Karri-Red Tingle-Yellow Tingle forest (DPIRD, 2020).

2.4 Hydrology

There are no expressions of groundwater or surface water on the site such as wetlands or creeks (National Map, 2020).

3 METHODOLOGY

3.1 Database Searches

Searches of the following databases were undertaken for a 10km radius around the central point of the site prior to the site survey:

- Department of Biodiversity, Conservation and Attractions (DBCA) Declared Rare and Priority Flora database and Threatened Ecological Communities database (Appendix 2);
- DBCA Naturemap Database (DBCA, 2020) (Appendix 3); and
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* (DAWE, 2020). A radius of 5km was used for this database (Appendix 4).

3.2 Site Survey

A flora and vegetation survey of the site was conducted by Dr Paul van der Moezel of PGV Environmental on 15 October 2020.

The site was walked to record all species in the survey area. Information on flora composition and vegetation structure was recorded in three 10m x 10m non-permanent quadrats in representative vegetation types.

Most plant species were identified in the field. Some specimens were photographed or taken for identification at the Perth Reference Herbarium or office using standard reference guides.

3.3 Survey Conditions

The conditions that the survey was undertaken in are presented in Table 1 in order to assess the adequacy of the survey. In summary, there were no constraints to the survey.

Table 1: Statement of Botanical Survey Conditions

Issue	Constraints (Y/N)*	Comment
Competency/experience of the consultant conducting the survey	No	Dr Paul van der Moezel has recent botanical survey experience in the Denmark area.
Proportion of the flora identified^	No	The timing of the survey in mid-October was optimal to identify most flora species on the site including all potential Threatened and Priority Flora. No follow-up survey required.
Sources of information (historic/recent or new data)	No	The flora of the Denmark area is well documented.
Proportion of the task achieved and further work that may need to be undertaken	No	No follow-up survey required as no Threatened Flora expected to occur in other seasons.

Issue	Constraints (Y/N)*	Comment
Timing/weather/season/cycle	No	The spring survey was optimal for most flora species. 2020 was a good year for ephemeral species, including orchids.
Disturbances (Fire)	No	The fire age of the vegetation was mostly greater than 5 years.
Intensity of survey (e.g. In retrospect was the intensity adequate)	No	The very small site and ease of access through the open understorey made for a full coverage.
Completeness (e.g. was relevant area fully surveyed)	No	
Resources (e.g. degree of expertise available for plant identification)	No	Experienced botanist undertook most plant identifications on site.
Remoteness and/or access problems	No	Easily accessible site close to the Denmark townsite.
Availability of contextual (e.g. bioregional) information for the study area.	No	Beard Vegetation Mapping

*Constraints have been rated as Significant, Moderate or No constraints

^Fungi and nonvascular flora (e.g. algae, mosses and liverworts) were not specifically surveyed for during the survey.

4 RESULTS

4.1 Flora Database Searches

A search of the DBCA Threatened Flora Databases: the WA Herbarium database (WAHerb), the Threatened (Declared Rare) and Priority Flora Species List (TFPL) (Appendix 2) and Naturemap Database (Appendix 3) indicates that a number of species that are listed as Endangered, Threatened or Priority have been located within a 10km radius of the site. The and the EPBC Act Protected Matters Search Tool (Appendix 4) indicates species that may have habitat within 5km radius of the site. The results from these database searches are shown in Table 2. None of the species has been recorded from the survey area.

Table 3 lists the likelihood that any of these species could occur on the site based on the soil types and vegetation condition.

Table 2: Conservation Significant Flora Identified in Database Searches

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Commersonia apella	Many-flowered Commersonia	Schedule 1	Critically Endangered
Isopogon uncinatus	Hook-leaf Isopogon	Schedule 1	Endangered
Verticordia apecta	Hay River Featherflower, Scruffy Verticordia	Schedule 1	Critically Endangered
Drakaea micrantha	Dwarf Hammer-orchid	Schedule 2	Vulnerable
Sphenotoma drummondii	Mountain Paper-heath	Schedule 2	Endangered
Caladenia harringtoniae	Harrington's Spider-orchid, Pink Spider-orchid	Schedule 3	Vulnerable
Conostylis misera	Grass Conostylis	Schedule 3	Endangered
Kennedia glabrata	Northcliffe Kennedia	Schedule 3	Vulnerable
Grevillea fuscolutea		Schedule 3	
Selliera radicans		Priority 1	
Stylidium sp. Kordabup (A.R. Annels 1660)		Priority 1	
Caladenia applanata subsp. erubescens	Rose Spider Orchid	Priority 2	
Melaleuca viminalis		Priority 2	
Amanita drummondii	Drummond’s Grisette	Priority 3	
Andersonia auriculata		Priority 3	
Andersonia sp. Mitchell River (B.G. Hammersley 925)		Priority 3	
Andersonia sp. Virolens (G.J. Keighery 12000)		Priority 3	
Angianthus drummondii		Priority 3	
Anthocercis sylvicola		Priority 3	
Borya longiscapa		Priority 3	

Scientific Name	Common Name	Conservation Status (WA)	Status under EPBC Act
Lasiopetalum sp. Denmark (B.G. Hammersley 2012)		Priority 3	
Leucopogon alternifolius		Priority 3	
Synaphea incurva		Priority 3	
Tetraria sp. Blackwood River (A.R. Annels 3043)		Priority 3	
Banksia serra		Priority 4	
Banksia sessilis var. *cordata*		Priority 4	
Boronia virgata		Priority 4	
Drosera fimbriata		Priority 4	
Eucalyptus virginea		Priority 4	
Lepidium pseudotasmanicum		Priority 4	
Microtis pulchella	Beautiful Mignonette Orchid	Priority 4	
Ornduffia submersa		Priority 4	
Pleurophascum occidentale	Western Giant-leaved Moss	Priority 4	
Thomasia quercifolia	Oak Leaved Thomasia	Priority 4	
Thomasia solanacea		Priority 4	
Xanthosia eichleri		Priority 4	

Conservation Codes are shown in Appendix 5

Table 3: Likelihood of Identified Significant Flora Species Occurring on the Site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Commersonia apella	Many-flowered Commersonia	The Many-flowered Commersonia occurs in grey sand over laterite near a river bank (Western Australian Herbarium, 2003).	Highly Unlikely – not suitable habitat
Isopogon uncinatus	Hook-leaf Isopogon	Hook-leaf Isopogon occurs in loam or sand on granite, peaty sand on swampy depressions, hillslopes.	Highly Unlikely – not suitable habitat
Verticordia apecta	Hay River Featherflower, Scruffy Verticordia	Hay River Featherflower grows in sandy clay with loam and broken granite on slopes in *Eucalyptus wandoo* woodland (George and George, 1994).	Highly Unlikely – not suitable habitat
Drakaea micrantha	Dwarf Hammer-orchid	Dwarf Hammer-orchid occurs in grey sands over dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps.	Highly Unlikely – not suitable habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Sphenotoma drummondii	Mountain Paper-heath	Mountain Paper-heath grows in stony or shallow soils over granite or quartzite on steep rocky slopes, crevices of rocks.	Highly Unlikely – not suitable habitat
Caladenia harringtoniae	Harrington's Spider-orchid, Pink Spider-orchid	Harrington's Spider-orchid occurs in sandy loam on winter-wet flats, margins of lakes, creeklines, granite outcrops.	Highly Unlikely – not suitable habitat
Conostylis misera	Grass Conostylis	Grass Conostylis prefers white or grey sand, sandy loam on winter-wet flats.	Highly Unlikely – not suitable habitat
Grevillea fuscolutea	Mt Lindesay Grevillea	Mt Lindesay Grevillea occurs in coarse grey sand or brown-black loam over granite on granite outcrops.	Highly Unlikely – not suitable habitat
Kennedia glabrata	Northcliffe Kennedia	Northcliffe Kennedia occurs in soil pockets, sandy soils on granite outcrops.	Highly Unlikely – not suitable habitat
Selliera radicans		*Selliera radicans* occurs in caline mud in estuarine areas.	Highly Unlikely – not suitable habitat
Stylidium sp. Kordabup (A.R. Annels 1660)		*Stylidium* sp. Kordabup (A.R. Annels 1660) is recorded from a g granite outcrop in shallow soil (Western Australian Herbarium, 1994).	Highly Unlikely – not suitable habitat
Caladenia applanata subsp. erubescens	Rose Spider Orchid	Rose Spider Orchid grows in sand on consolidated dunes, summer burnt areas.	Highly Unlikely – not suitable habitat
Melaleuca viminalis		*Melaleuca viminalis* is recorded from stony riverbed in rapids with sandstone rocks overlying volcanics, in the creekline of sandstone gorges in sand among rocks, and around a pool below a waterfall (Craven, Lepschi and Cowley, 2010).	Highly Unlikely – not suitable habitat
Amanita drummondii	Drummond's Grisette	Drummond's Grisette is solitary to gregarious in leaf litter in association with *Agonis flexuosa, A. theiformis, Allocasuarina fraseriana, Corymbia calophylla, Eucalyptus marginata, E. patens, E. staeri, Jacksonia furcellata, Kunzea glabrescens, Melaleuca* sp., *Podocarpus drouynianus*, *Taxandria parviceps*. (Davidson *et al*., 2015) growing in sandy soil (Amanitaceae Org, 2015).	Highly Unlikely – not suitable habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Andersonia auriculata		*Andersonia* auriculata grows in grey or peaty sand, often over laterite in swampy areas, granite outcrops.	Highly Unlikely – not suitable habitat
Andersonia sp. Mitchell River (B.G. Hammersley 925)		*Andersonia* sp. Mitchell River (B.G. Hammersley 925) grows in grey sand over laterite or granite.	Possible
Andersonia sp. Virolens (G.J. Keighery 12000)		*Andersonia* sp. Virolens (G.J. Keighery 12000) grows in grey sand over laterite or granite on midslopes	Possible
Angianthus drummondii		*Angianthus drummondii* grows in grey or brown clay soils, ironstone on seasonally wet flats.	Highly Unlikely – not suitable habitat
Anthocercis sylvicola		*Anthocercis sylvicola* occurs in brown, gravelly, free draining clay-loam soils in moisture gaining sites with *Eucalyptus jachsonii, E. guifoyleii* and *E. diversicolor*, proximinal to water-shedding areas of granite (Macfarlane and Wardell-Johnson, 1996).	Highly Unlikely – not suitable habitat
Borya longiscapa		*Borya longiscapa* grows in grey sand on granite outcrops.	Highly Unlikely – not suitable habitat
Lasiopetalum sp. Denmark (B.G. Hammersley 2012)		*Lasiopetalum* sp. Denmark (B.G. Hammersley 2012) grows in sand, sandy or gravelly loam on granite outcrops, slopes, lateritic ridges.	Possible
Leucopogon alternifolius		*Leucopogon alternifolius* grows in grey/white sand in swampy areas, seasonally wet areas.	Highly Unlikely – not suitable habitat
Synaphea incurva		*Synaphea incurva* occurs in gravelly loam, sandy soils on slopes.	Possible
Tetraria sp. Blackwood River (A.R. Annels 3043)		*Tetraria* sp. Blackwood River (A.R. Annels 3043) is recorded from a creek bed (Western Australian Herbarium, 2005).	Highly Unlikely – not suitable habitat
Banksia serra		*Banksia serra* grows in gravel, sand or clay loam over laterite on hillslopes.	Possible
Banksia sessilis var. *cordata*		*Banksia sessilis* var. *cordata* grows in white/grey sand on coastal limestone.	Highly Unlikely – not suitable habitat
Boronia virgata		*Boronia virgata* grows in peaty sand or clay on swampy or waterlogged places.	Highly Unlikely – not suitable habitat

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
Drosera fimbriata		*Drosera fimbriata* occurs in white sand, granite.	Highly Unlikely – not suitable habitat
Eucalyptus virginea		*Eucalyptus virginea* grows in clay or sandy loam, shallow soil over granite, laterite loam over clay on lower slopes near watercourses, edge of rock outcrops, gently sloping sites.	Highly Unlikely – not suitable habitat
Lepidium pseudotasmanicum		*Lepidium pseudotasmanicum* occurs in loam, sand associated with granite.	Highly Unlikely – not suitable habitat
Microtis pulchella	Beautiful Mignonette Orchid	Beautiful Mignonette Orchid grows in peaty sand in winter-wet swamps.	Highly Unlikely – not suitable habitat
Ornduffia submersa		*Ornduffia submersa* grows in freshwater 0.05-0.6 m deep in pools, lakes, swamps, winter-wet depressions, claypans.	Highly Unlikely – not suitable habitat
Pleurophascum occidentale	Western Giant-leaved Moss	Western Giant-leaved Moss is known to occur in a wide range of habitat including shallow soils on the edge of granite, deep white sand on laterite, sandy clay loam on sandstone, pink sand on sandstone as well as sandy soils some distance from granite outcrops (Brown *et al.,* 1998; DEC, 2009). It is generally associated with *Agonis flexuosa* and *Thryptomene saxicola* (Wyatt and Stoneburner, 1989).	Highly Unlikely – not suitable habitat
Thomasia quercifolia	Oak Leaved Thomasia	Oak Leaved Thomasia is recorded from grey sand on a slope in coastal dunes (Western Australian Herbarium, 1993).	Highly Unlikely – not suitable habitat
Thomasia solanacea		*Thomasia solanacea* grows in alluvium, sand over limestone, rocky loam in coastal areas.	Highly Unlikely – not suitable habitat
Xanthosia eichleri		*Xanthosia eichleri* grows in grey sand over granite, sandy loam on granite outcrops in jarrah/marri woodland.	Highly Unlikely – not suitable habitat

* sourced from Florabase (DBCA, 2017) and SPRAT Database (DoEE, 2016) as well as the DBCA database searches unless otherwise denoted

4.2 TEC and PEC Desktop Search

A search of DBCA's Threatened (TEC) and Priority Ecological Communities (PEC) database was conducted within a radius of 5km around the site (38-0919EC) (Appendix 6). One TEC and two Priority PECs at State level were identified in the database search (Table 4). The Coastal Saltmarsh PEC is listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as a TEC. The communities identified in the database searches are outlined in Table 4.

Table 4: Threatened and Priority Ecological Communities likely to occur within 5km of the Site

Ecological Community	Description	Conservation Status WA	Status under the EPBC Act
Mount Lindesay	Mount Lindesay - Little Lindesay Vegetation Complex	Endangered	
Melaleuca spathulata/ Melaleuca viminea	*Melaleuca spathulata/Melaleuca viminea* Swamp Heath	Priority 1	
Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh	Priority 3	Vulnerable

4.3 Flora

A total of 31 plant species were recorded during the survey (Appendix 7). The total consisted of 31 native and no introduced species. Exotic trees and shrubs and lawns within the holiday accommodation part of the site were not included in the survey. The number of native species is low but consistent with Karri woodland vegetation in the Albany-Denmark area and the small area of native vegetation with very little variation on the site.

There was very little to no herbaceous layer with the ground cover having a very thick cover of leaf litter, branches and logs.

There were no Threatened (Declared Rare) or Priority plant species recorded on the site. The three Priority species that were identified in the database search as possibly occurring on the site do not occur on the site. The three species, one *Lasiopetalum* and two *Andersonia* species are perennial shrubs. No *Lasiopetalum* or *Andersonia* species were recorded on the site.

Quadrat Data are provided in Appendix 8.

Species richness in the three quadrats ranged from 9-13 species.

4.4 Vegetation

4.4.1 Vegetation Complex

The site is located in the eastern part of the Warren Interim Bio-geographic Regional Area (IBRA), which extends from the coast from just south of Yallingup to south of the Princess Royal Harbour near Albany. The Region is described as:

> *Dissected undulating country of the Leeuwin Complex and Albany Orogen with loamy soils supporting Karri forest, laterites supporting Jarrah-Marri forest, leached sandy soils in depressions and plains supporting paperbark/sedge swamps, and Holocene marine dunes with Agonis flexuosa woodlands. Moderate Mediterranean* (Hearn *et al*., 2002).

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall (Heddle *et al*., 1980). The vegetation is part of the Keystone Complex which is described as

> *Mosaic of tall open forest of Eucalyptus guilfoylei-Eucalyptus jacksonii-Eucalyptus diversicolor on slopes of major hills rising above coastal plain with Allocasuarina decussata-Banksia grandis-Agonis flexuosa on slopes in hyperhumid and perhumid zones and tall open forest of Eucalyptus brevistylis-Eucalyptus marginata subsp. marginata-Corymbia calophylla and the occasional Eucalyptus megacarpa near rock outcrops in hyperhumid and perhumid zones* (Shepherd *et al*., 2001).

4.4.2 Vegetation Type

For small scale sites, such as the survey area, vegetation mapping can be further refined by using vegetation types which are described by the composition and structure of the dominant species rather than based on geomorphology.

Two very similar native vegetation types were described and mapped on the site (Table 5 and Figure 3). The composition of the tree canopy included Karri (*Eucalyptus diversicolor*) and Yellow Tingle (*Eucalyptus guilfoylei*) varied over the site with Yellow Tingle more prevalent at the northern end and Karri more dominant in the central portion. The understorey was similar but was slightly different at the southern end with the tall shrub *Trymalium odoratissimum* var. *trifidum* becoming a dominant species.

Table 5: Vegetation Types on the Site

Vegetation Type	Description	Photograph
EgEd1 *Eucalyptus guilfoylei Eucalyptus diversicolor/* Open Forest over *Acacia pentadenia/Taxandria parviceps/Hibbertia cuneiformis/Lepidosperma effusum* Shrubland over leaf litter	This is the main vegetation type on the site with Karri (*Eucalyptus diversicolor*) and Yellow Tingle (*Eucalyptus guilfoylei*) present up to 15m high and varying in their dominance on the site. The understorey contains a mid-canopy around 2m high with *Acacia pentadenia, Taxandria parviceps, Hibbertia cuneiformis* and *Leucopogon verticillatus* common and the native sedge *Lepidosperma effusum* common. Almost no herb layer is present. The soils are Dark orange-brown sandy loam with some laterite at surface. Quadrats KR1 and KR2 are representative of this vegetation type.	Karri Dominant  Yellow Tingle Dominant 

Vegetation Type	Description	Photograph
EgEd2 *Eucalyptus guilfoylei/Eucalyptus diversicolor* Open Forest over *Trymalium odoratissimum/Lepidosperma effusum* Shrubland over leaf litter	This vegetation type is similar to the EgEd1 type with Karri and Yellow Tingle trees and occurs on the lower slopes of the site. The understorey contains the tall shrub *Trymalium odoratissimum* as a dominant shrub. *Lepidosperma effusum* is common. The soils are Dark orange-brown sandy loam, some laterite at surface. Quadrat KR3 is representative of this vegetation type.	

4.4.3 Vegetation Condition

The condition of the vegetation was assessed according to the system of Keighery as described in Bush Forever (Government of Western Australia, 2000) (Table 6).

Table 6: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

The condition of the vegetation is shown in Figure 3. The area of native vegetation in the western half is in Excellent condition and may be Pristine except that the understorey appears to have been grazed extensively by kangaroos. The eastern edge of the Karri/Yellow Tingle Forest has some weeds and is mapped as Very Good. The small remnant stands of Karri/Yellow Tingle close to Kearsley Road have few to no weeds but have been thinned out over time and are rated as Good to Very Good.

4.5 Conservation Significance of Flora and Vegetation

4.5.1 Flora

No Threatened or Priority flora species were recorded on the site. No other species of conservation significance were recorded.

4.5.2 Vegetation

The vegetation on most of the site is part of the Keystone Complex. The Keystone Complex has 78.25% remaining and 57.5% in secure reserves (DBCA, 2018) and is therefore not considered of conservation priority.

The vegetation types are not representative of either of the three Priority Ecological Communities recorded within 10km of the site.

The vegetation on the site offers some protection to the vegetation in the McLean Road Nature Reserve with regards to the spread of weeds and dieback into the Reserve. Retention of vegetation on the western side of the proposed development is therefore recommended. Retention of vegetation will need to address the likely impact of bushfire hazard to future proposed residences elsewhere on the site.

The vegetation on the site is part of a larger area of remnant vegetation that includes McLean Road Nature Reserve and Redmond Road Nature Reserve (R31561 – 52.3ha) further to the north-west and vegetation on other private lots in the general area of the eastern slopes of Mt Shadforth. The vegetation on the site, therefore, adds to the fauna value of the areas of remnant vegetation in the general area.

5 SUMMARY AND CONCLUSIONS

The Flora and Vegetation survey of the site resulted in the following findings:

- A total of around 8.5ha of native vegetation occurs on the 12.3ha site, with most of it (7.7ha) on the western side;
- A total of 31 plant species were recorded in areas of native vegetation during the 2020 flora survey. All plants recorded were native;
- No Threatened (Declared Rare) or Priority flora species were recorded on the site;
- Two very similar vegetation types were described and mapped on the site – Karri (*Eucalyptus diversicolor*) and Tingle (*E. guilfoylei*) Forest, only varying slightly in the understorey composition. The trees occurred over a sparse tall shrub layer and a ground cover containing very thick leaf litter, branches and logs with very few plants;
- The vegetation was mostly rated in Excellent condition;
- The vegetation is not a Threatened or Priority Ecological Community or part of a Vegetation Complex of conservation significance;
- Similar vegetation occurs on the McLean Road Nature Reserve (12.3ha) located to the west of the site as well as in private rural lots adjoining the site to the north, west and south, and in that regard is well represented in the Denmark area; and
- The vegetation on the site offers some protection to the vegetation in the McLean Road Nature Reserve with regards to the spread of weeds and dieback into the Reserve. The vegetation on the site is also part of a larger area of remnant vegetation that includes McLean Road Nature Reserve and Redmond Road Nature Reserve (R31561 – 52.3ha) further to the north-west and adds to the fauna value of the areas of remnant vegetation in the general area; and
- Development of the site in accordance with the Amended Structure Plan (Appendix 1) would result in retention of a large proportion of the Karri/Tingle Forest in the western POS Reserve lot and potential retention of some trees on the smaller eastern lots adjacent to Kearsley Road. Retention of a large proportion of the vegetation in the western lot would retain the ecological function of the vegetation adjacent to the Nature Reserve and other nearby areas of vegetation. The requirements for bushfire protection of the 38 proposed residential lots will need to be considered so that the clearing of trees and understorey in the proposed POS lot is minimised or avoided.

6 REFERENCES

Amanitaceae Org (2015) Species Profile *Amanita carneiphylla* Accessed August 2015 http://www.amanitaceae.org/?Amanita+carneiphylla Australia

Brown, A., Thomson-Dans, C. and Marchant, N. (eds) (1998). *Western Australia's Threatened Flora*, WA Department of Conservation and Land Management, Perth, Western Australia

Craven, L.A., Lepschi, B.J. and Cowley, K.J. (2010) *Melaleuca* (Myrtaceae) of Western Australia: five new species, three new combinations, one new name and a new state record. *Nuytsia* 20: 27-36 Perth, Western Australia

Davidson, E.M., Giustiniano, D., McGurk, L.E., Syme, K. and Robinson, R.M. (2015) *Amanita drummondii* and *A. quenda* (Basidiomycota), two new species from Western Australia, and an expanded description of *A. walpolei* *Nuytsia* 25:1-13 Perth, Western Australia

Department of Agriculture, Water and the Environment (DAWE) (2020) *Protected Matters Search Tool* http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf Accessed October 2020 Canberra, Australia

Department of Biodiversity, Conservation and Attractions (DBCA) (2017) *Florbase* https://florabase.dpaw.wa.gov.au/ Accessed 2017 Perth western Australia

Department of Biodiversity, Conservation and Attractions (DBCA) (2018) *Remnant Vegetation Extent Stats* 2018 Perth western Australia

Department of Biodiversity, Conservation and Attractions (DBCA) (2020) *Naturemap* Accessed October 2020 https://naturemap.dpaw.wa.gov.au/ Perth Western Australia

Department of Environment and Conservation (DEC) (2012) Cinnamon Sun Orchid Endangered Flora of Western Australia Fact Sheet. https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/flora_posters/ThelymitraDedmaniarum2009135.pdf Accessed June 2016 Perth Western Australia

Department of Environment and Conservation (DEC) (2009) Records held in DEC's declared flora database and rare flora files. Western Australian Department of Environment and Conservation. Perth, , Western Australia

Department of Mines, Industry Regulation and Safety (DMIRS) (2020) Geoview WA Accessed October 2020 https://geoview.dmp.wa.gov.au/geoview/?Viewer=GeoView Perth Western Australia

Department of Primary Industries and Regional Development (DPIRD) (2020) *Natural Resource Information.* Accessed October 2020 http://maps.agric.wa.gov.au/nrm-info/ Government of Western Australia, Perth.

Department of the Environment and Energy (DotEE) (2016) *Species Profile and Threats (SPRAT) Database*. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl Commonwealth of Australia.

Environmental Protection Authority (EPA) (2016) *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* Perth Western Australia

George, E.A. and George, A.S. (1994) New taxa of *Verticordia* (Myrtaceae : Chamelaucieae) from Western Australia *Nuytsia* 9 (3): 333–341 Perth, Western Australia

Government of Western Australia (2000) Bush Forever - *Keeping the Bush in the City. Volume 2: Directory of Bush Forever Sites*. Perth, Western Australia.

Hearn, R., Williams, K. and Comer, S (2002) *Warren (WAR – Warren) Subregional description and biodiversity values* https://www.dpaw.wa.gov.au/images/documents/about/science/projects/waaudit/warren_p637-655.pdf Accessed November 2020 Perth, Western Australia

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980) Vegetation complexes of the Darling System, Western Australia. In *Atlas of Natural Resources of the Darling System of Western Australia*. Department of Conservation and Environment. Perth, Western Australia.

Landgate (2020) Historical Aerial Photography Accessed October 2020 https://www.landgate.wa.gov.au/bmvf/app/mapviewer/ Government of Western Australia, Perth.

Macfarlane, T.D. and Wardell-Johnson, G. (1996) *Anthocercis sylvicola* (Solanaceae), a rare new species from the tingle forests of Walpole, south-western Australia *Nuytsia* 11 (1): 71–78 Perth, Western Australia.

National Map (2020) Map-Based Access to Spatial Data from Australian Government Agencies http://nationalmap.gov.au/#wa Accessed October 2020 Government of Australia

Shepherd, D.P., Beeston, G.R, and Hopkins, A.J.M (2001) *Native Vegetation in Western Australia. Technical Report 249.* Department of Agriculture Western Australia, South Perth.

Western Australian Herbarium (1989) Online record on Atlas of Living Australia *Eryngium pinnatifidum* subsp. Palustre http://biocache.ala.org.au/occurrences/579560ea-be88-440b-9ab0-e93999c5b08d Accessed October 2015 Perth

Western Australian Herbarium (1993) Atlas of Living Australia; Australia's Virtual Herbarium Record *Thomasia quercifolia* http://biocache.ala.org.au/occurrences/831857e7-64d7-42ef-a34f-dd55de7cda95 Accessed July 2017 Perth, Western Australia

Western Australian Herbarium (1994) Atlas of Living Australia; Australia's Virtual Herbarium Record *Stylidium* sp. Kordabup http://biocache.ala.org.au/occurrences/709cd79a-7c38-4119-b793-983950d6c4ac Accessed June 2017 Perth

Western Australian Herbarium (2003) Atlas of Living Australia Online Record for *Commersonia apella* http://biocache.ala.org.au/occurrences/0c76de93-98cd-43b6-a2e3-cdb512edefdd Accessed March 2016 Perth

Western Australian Herbarium (2006) Atlas of Living Australia; Australia's Virtual Herbarium Record Tetraria sp. Blackwood River http://biocache.ala.org.au/occurrences/d24486ad-1def-4028-be8e-80fece253959 Accessed July 2017 Perth, Western Australia

Western Australian Herbarium (2011) Atlas of Living Australia; Australia's Virtual Herbarium Record *Meionectes tenuifolia* http://biocache.ala.org.au/occurrences/04496260-6c2d-423f-88ef-4dd95c1aa6a8 Accessed April 2017 Perth, Western Australia

Western Australian Planning Commission (WAPC) (1994) Shire of Denmark Local Planning Scheme No. 3 Perth, Western Australia

Williams, K., Horan, A., Wood, S. and Webb, A (2001) *Declared rare and poorly known flora in the Central Forest Region, Western Australian Wildlife Management Program No. 33*, Western Australian Department of Conservation and Land Management. Perth, Western Australia

Wyatt, R. and Stoneburner A. (1989) *Pleurophascum occidentale*: A New Moss from Western Australia *The Bryologist* Vol. 92, No. 3 (Autumn, 1989), pp. 299-301 USA

FIGURES

PINPOINT CARTOGRAPHICS (08) 9562 7136 2020-541-f01.dgn

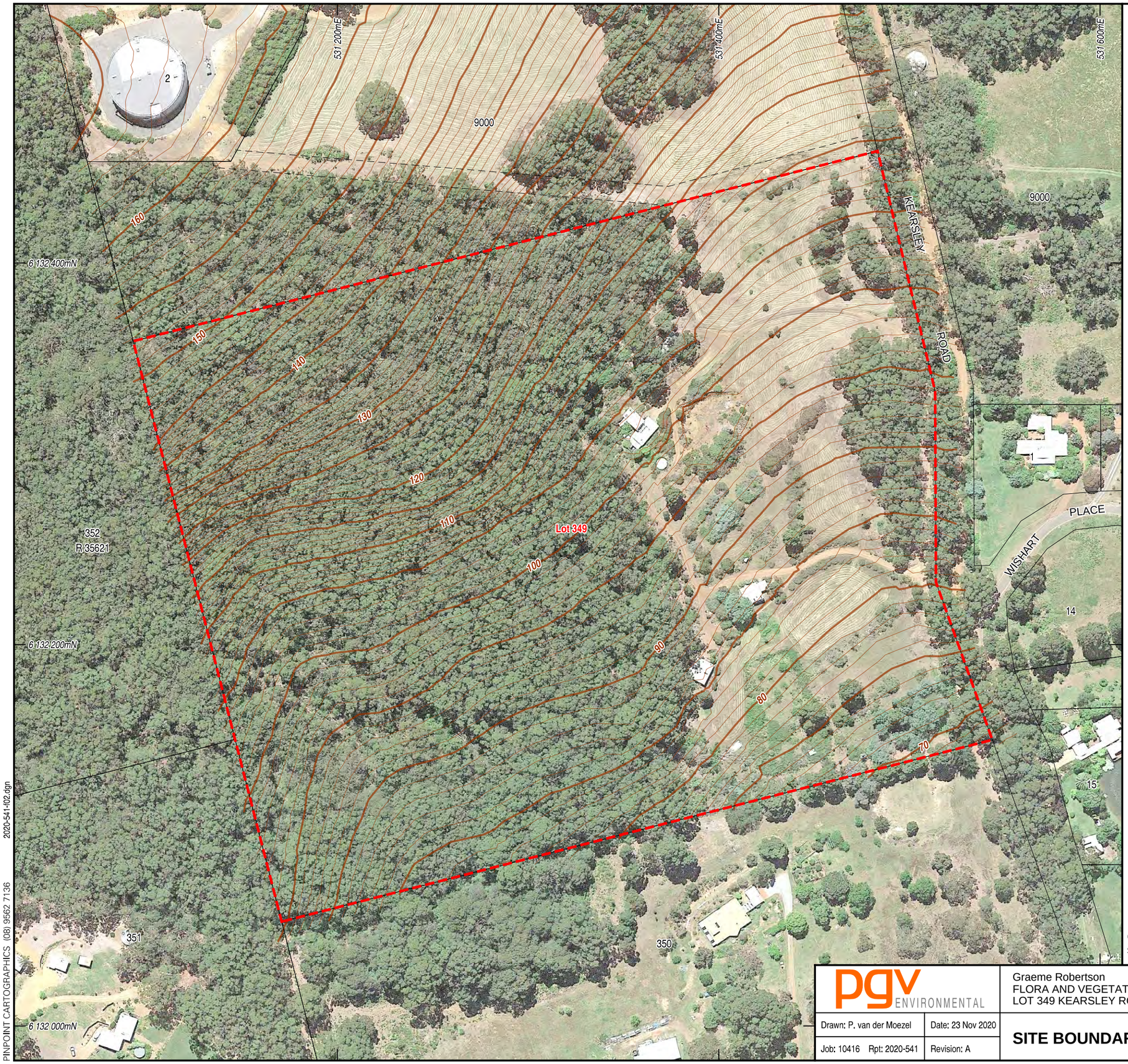
Graeme Robertson
FLORA AND VEGETATION SURVEY
LOT 349 KEARSLEY ROAD, DENMARK

pgv ENVIRONMENTAL

Drawn: P. van der Moezel	Date: 23 Nov 2020
Job: 10416 Rpt: 2020-541	Revision: A

SITE LOCATION

Figure 1



N

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SCALE 1 : 2 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Topographic Contour

CADASTRAL SOURCE: Landgate, November 2020.
AERIAL PHOTOGRAPH SOURCE: GoogleEarth, flown November 2017.
TOPOGRAPHIC CONTOURS SOURCE: Sam Williams, Ref 20-007-001C, 29/09/2020.

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LOT 349 KEARSLEY ROAD, DENMARK

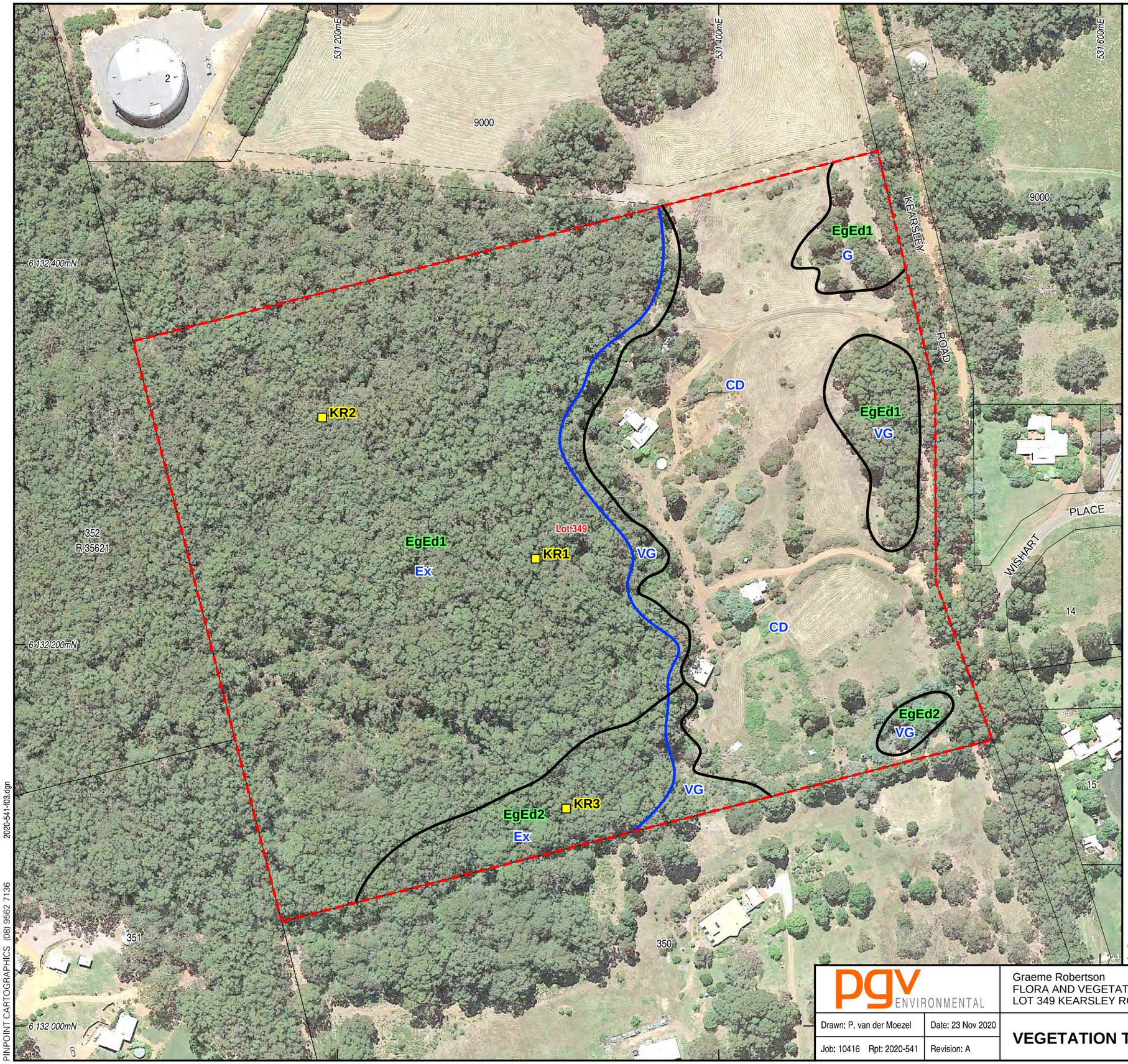
Drawn: P. van der Moezel | Date: 23 Nov 2020
Job: 10416 Rpt: 2020-541 | Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2

2020-541-102.dgn

PINPOINT CARTOGRAPHICS (08) 9562 7136



N

0 20 40 60 80 100m

SCALE 1 : 2 000 at A3 (MGA)

Legend

- Site Boundary
- Cadastral Boundary
- Easement Boundary
- Quadrat Location
- Vegetation Type Boundary
- Vegetation Condition Boundary
- EgEd1 Vegetation Type
- CD Vegetation Condition

Vegetation Types

EgEd1
Eucalyptus guilfoylei Eucalyptus diversicolor/ Open Forest over *Acacia pentadenia/Taxandria parviceps/Hibbertia cuneiformis/Lepidosperma effusum* Shrubland over leaf litter

EgEd2
Eucalyptus guilfoylei/Eucalyptus diversicolor Open Forest over *Trymalium odoratissimum/Lepidosperma effusum* Shrubland over leaf litter

Vegetation Condition
(SOURCE: Bush Forever, Govt. of W.A., 2000)

P - Pristine
Pristine or nearly so, no obvious signs of disturbance.

Ex - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.

VG - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

G - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

D - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

CD - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

CI - Cleared
No native vegetation remaining.

CADASTRAL SOURCE: Landgate, November 2020.
AERIAL PHOTOGRAPH SOURCE: GoogleEarth, flown November 2017.

pgv ENVIRONMENTAL

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FLORA AND VEGETATION SURVEY
LOT 349 KEARSLEY ROAD, DENMARK

Drawn: P. van der Moezel | Date: 23 Nov 2020
Job: 10416 Rpt: 2020-541 | Revision: A

VEGETATION TYPES AND CONDITION

Figure 3

PINPOINT CARTOGRAPHICS (08) 9562 7136 2020-541-f03.dgn

APPENDIX 1

Amended Structure Plan

LEGEND

APPLICATION AREA

EXTENT OF CLEARING

PLANNING UNIT C - KEARSLEY ROAD STRUCTURE PLAN

AMENDED STRUCTURE PLAN

LOT 349 KEARSLEY ROAD

FIGURE 2

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date - 8 Dec 2020 | ref - 20-001-001B

scale - 1:2000 @ A3

0m 20m

APPENDIX 2

DBCA Flora Database Searches

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
5603	5255589	45013	Amanita drummondii	3	Pileus 57 mm wide, plane, very slightly depressed at centre, ovoid, light dull brown, flesh hard, white. Lamellae 24 mm l x 5.5 mm d, free, close, narrow, white. Stipe 123 mm l x 10(apex)-15(above base) mm w, tapering up from soil, central, terete, surfa		Eucalyptus marginata, Allocasuarina fraseriana, Agonis flexuosa, A. parviceps, A. hypericifolia, Melaleuca sp.		Field name: austrogrisette. Piece of gill removed for molecular sequencing - E.M. Davison 16.11.2012.	Cemetery Road, Denmark	MAN	0	3/06/1992
5846	4765281	6301	Andersonia auriculata	3	Shrub, blue flowers.	Lower slope; grey sand.	Allocasuarina fraseriana, Banksia quercifolia, B. illicifolia, Corymbia ficifolia, Eucalyptus patens.			Plot 4273, Gum Link Road,	MAN	0	20/08/1990
6311	6329128	41741	Andersonia sp. Virolens (G.J. Keighery 12000)	3	Low domed shrub to 15 cm. Calyx and corolla creamy white, anthers bright red. Unpleasant smell, lots of flies.	On edge of outcropping granite. SW facing slope. Grey and white shallow coarse sand. Large outcrop.	Heath on edge of outcropping granite.	frequent.		Mount Lindesay walk trail, ca 100 m below summit	MAN	3	16/09/1994
6739	5218306	16321	Anthocercis sylvicola	3	Diffuse shrub with drooping branches. Smaller branches flexuose with a spine and one or two small leaves at each angle. Height 1.5m. Not in flower but a few very immature buds - axillary, solitary & pedunculate. 5-ous with tips of both calyx lobes and pe	Moderate slope between granite summit and gully.	Karri Forest over thicket of Chorilaena quercifolia, Leucopogon verticillatus, L.capitellatus & Xanthorrhoea preissii.		One plant only seen on track but not identified at time of collection. Wider search planned at flowering time.	Denmark Shire. Mt Hallowell Reserve. On Bibbulum Track c.500 m. ENE of Trig.Station.	MAN	0	30/08/1998
9798	3358704	32084	Banksia serra	4	Erect, slender tall shrub 1-4 m. Flowers yellow.	Grey sand. Laterite. N facing slope.	Jarrah/Marri woodland. Acacia browniana, Hibbertia furfuracea, Petrophile diversifolia, Bossiaea linophylla.		Abundance: locally abundant.	Mount Hallowell Recreation Reserve: NE corner at entrance from Hallowell Break Road, Denmark Shire	MAN	0	8/09/1993

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
9827	5796504	32084	Banksia serra	4	Slender erect shrubs to a height of 3 m. Flowers yellow.	Grey sand over laterite on a road verge.	In low Jarrah/Marri Forest A over Heath B. Assoc. with Bossiaea linophylla, Agonis hypericifolia and Hakea amplexicaulis.	an isolated group of ca 50 plants.		Denmark Shire. Scotsdale Road, c.2 kms past the Hamilton Road turn-off.	GPS	0	8/09/2000
9988	8737916	32078	Banksia sessilis var. cordata	4	Shrub, 1.5 m high, 0.8 m wide. Erect open perennial. Flowers yellow.	Dune hillside, Shire Reserve. White sand.	Low trees, tall shrubland. Agonis flexuosa, Spyridium globulosum, Acacia littorea.	over 50 plants.	Population structure: 100% in bud, 100% flowering, 30% fruiting. Reproductive method: seeds.	Shire Reserve 24913. Scattered along walk trails around Point Walton and Wilson Head at end of Ocean Beach Road	GPS	1	7/07/2010
11295	957992	4447	Boronia virgata	4		Near coast.				5 miles W of Denmark, near coast	MAN	3	9/03/1965
11298	3507815	4447	Boronia virgata	4	Erect slender 1.5 m high, Flowers pink with darker central stripe. cf. BGH 993, fewer, flatter leaflets, sepals glabrous.	Peat - peat swamp.	Dense heath A, Agonis parviceps, Astartea fascicularis, Agonis linearifolia.	occasional over large area.		Denmark Shire, William Bay National Park, peat swamp adjacent to NE boundary	MAN	0	24/10/1993
11320	6905498	4447	Boronia virgata	4	Open shrub.	Seasonally inundated. Grey clayey sand.	Boronia stricta, Evandra aristata, Acacia divergens and Beaufortia sparsa.	abundant, more than 1 plant.	95% of population in flower.	Walpole	GPS	1	17/10/2001
11366	4485734	1270	Borya longiscapa	3	Plant with 40 cm scape with pale yellow flowers.	Soil, coarse sand on granite.	In association with Pterostylis vittata and Tribonanthos longipetala.			Stan Road, track west to granite peak, Denmark State Forest, Shire of Denmark,	AUTO	3	24/09/1992
12068	909572	15329	Caladenia applanata subsp. erubescens	2		On steep sand slope.	Growing in heath of Pimelea rosea, Casuarina humilis with pockets of Agonis flexuosa thicket.		Abundance: 20+ plants in full flower.	William Bay National Park, 12 km SW of Denmark, 7.5 km SE of Parryville	MAN	0	7/10/1984

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
12070	264083	15329	Caladenia applanata subsp. erubescens	2	Flowers pink, faint sweet odour.	Undulating to steep sloped hills. Sand and outcropping limestone.	Growing in dense low heath.	50+ plants in full flower.		William Bay National Park; 3.5 km W of Ocean Beach Road on Mooney Valley Road, 8 km SSW of Denmark,	MAN	3	7/10/1984
18664	1824082	13635	Drakaea micrantha	T	Tuberous herb, leaves succulent green, flowers reddish.	Grey gritty sand over granite.	Eucalyptus ? staeri mallee heath.		Abundance: dense colony in full flower.	Mount Lindesay	MAN	0	3/11/1990
18745	6267920	3096	Drosera fimbriata	4	Erect dwarf annual herb to 5 cm high. Leaves red, flowers white.	Grey sand. Sides of walk-track in secondary dunes.	Open dwarf scrub D. Andersonia caerulea and Platysace pendula.	locally frequent.	D.R.F - specimen for Rare Flora report.	Denmark Shire; William Bay National Park. Track from E boundary to Lake Williams	MAN	2	20/10/1993
24073	4533062	19629	Eucalyptus virginea	4	Small multistemmed tree, coppice from old burnt out stump. c. 10 m high, flowers white.	Lower slope of creek bank.	Partly cleared previously Karri and blackbutt, occasional Agonis parviceps now present.			5.5 km W of Denmark off Lapkos Road, Loc. 420,	MAN	0	8/07/1993
24074	4533054	19629	Eucalyptus virginea	4	Small multistemmed tree, coppice from old burnt out stump. c. 10 m high, flowers white.	Lower slope of creek bank.	Partly cleared previously Karri and blackbutt, occasional Agonis parviceps now present.			5.5 km W of Denmark off Lapkos Road, Loc. 420,	MAN	0	8/07/1993
24075	4535499	19629	Eucalyptus virginea	4	Small tree 12 m high, flowers white.	Lower mid-slope, sandy loam site.	Eucalyptus calophylla, E. marginata, Leucopogon verticillatus, L. capitellaus, Mirbelia dilatatus, Hibbertia cuneiformis, H. furfuracea, Agonis parviceps, A. hypocrateiformis, Xanthorrhoea preissii, Xanthosia rotundifolia.			5.5 km W of Denmark off Lapkos road, Loc.420	MAN	0	8/07/1993

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
24076	4533038	19629	Eucalyptus virginea	4	Small multi-stemmed tree, coppice from old tree. Flowers white.	Lower slope, clay loam. Drainage lines have been disturbed and site, so quite wet.	Cleared pasture previously Karri site.			5.5 km W of Denmark off Lapkos Road, Warren District	MAN	0	8/07/1993
24077	4533046	19629	Eucalyptus virginea	4	Small tree, c. 10 m high. Flowers white.	Lower slope near small dam. Clay loam. Drainage disturbed by small dam construction.	Cleared rough pasture previously Karri type.	isolated tree.		5.5 km W of Denmark off Lapkos Road	MAN	0	8/07/1993
24113	1420526	19629	Eucalyptus virginea	4	Coppiced tree to 8-12 m. Bark white, slightly powdery.		In paddock.	6 trees in paddock.		6 km W of Denmark on the Lapkos Road	AUTO	3	/06/1988
24114	1448595	19629	Eucalyptus virginea	4						Lapkos Road, Denmark	MAN	3	23/05/1988
27890	4125312	13084	Grevillea fuscolutea	T	Upright spreading shrub to 1.8 m, flowers yellow, leaves pale green and hairy, stems hairy.	Cultivated in Denmark Garden.				Garden of B.G. Hammersley, Denmark,	MAN	3	10/08/1994
33407	4497333	4039	Kennedia glabrata	T	Prostrate, 20 cm high x 60 cm wide.	Outcrop, brown loam over granite.	Agonis, Anthocerisis, Eutaxia, Stypandra.			Outcrop, William Bay National Park,	MAN	0	29/10/1996
34250	5333121	33498	Lasiopetalum sp. Denmark (B.G. Hammersley 2012)	3	Slender erect shrub from 0.8 to 1.5 m. Flowers white to faintly tinged pink.	In shallow sand in areas of surface laterite.	In Jarrah Woodland with Banksia grandis, Agonis parviceps, Grevillea occidentalis.		Abundance: c. 100 plants.	Denmark Shire. Kernutts Road, c.3.5 km from Denmark-Mt Barker Road at entrance to disused sawmill & in adjacent Forest Reserve 26565.	MAN	0	19/09/1998
34716	3418448	3042	Lepidium pseudotasmanicum	4						Pig yard, State Farm, Denmark	AUTO	3	14/06/1940
34725	3418421	3042	Lepidium pseudotasmanicum	4						Pig yard, State Farm, Denmark	AUTO	3	14/06/1940
37562	8457646	37683	Melaleuca viminalis	2	Slender erect weeping shrub, 3 m high x 2 m wide. Flowers crimson red, in flower.	Creekline. Brown sandy clay.	Remnant Eucalyptus diversicolor forest over sedges.	locally common.		Denmark townsite, near Old Hospital	GPS	1	18/11/2011
38144	294896	1662	Microtis pulchella	4		Peat bog. Burnt in March.				10 km W of Walpole, South of Highway	MAN	3	22/12/1981

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
40846	6943640	19062	Pleurophascum occidentale	4	c.20 tufts varying from 1 to 20 cm diam. in an area 1.5 m.square. One small disjunct tuft in which many plants have orange antheridia.	On moist grey sand.	In thicket.			Denmark Shire. Hallowell Reserve. South side, on the old track to Monkey Rock, ca 25 m from the Lights Road carpark	GPS	1	7/07/2003
43444	4744489	7651	Selliera radicans	1	Prostrate stems to 50 cm, rooting at nodes. Fleshy erect leaves. Flowers sparse, pale blue, pedicillate.	At edge of inlet below high water line, now moist sand.	Open herbs, Lobelia alata, Villarsia parnassifolia, Samolus junceus, Apium prostratum.		Abundance: abundant in restricted area.	Wilson Inlet, W end of Crusoe Beach,	MAN	0	1/02/1997
43445	4744470	7651	Selliera radicans	1	Prostrate stems to 50 cm, rooting at nodes. Fleshy erect leaves. Flowers sparse, pale blue, pedicillate.	In a pile of dead seagrass closed to waters edge in saline mud.	Open Melaleuca scrub over Cyeraceae and Sarcocornia blackiana.		Abundance: small population c. 1 m diam.	Wilson Inlet - Crusoe Beach - E end,	MAN	0	1/02/1997
43447	2763338	7651	Selliera radicans	1	Prostrate.	On saline mud, inundated by estuarine water at high tide.	Shaded by Melaleuca cuticularis.			Caruso Beach on Wilson Inlet, 10 km W of Denmark	AUTO	4	4/03/1977
43448	6476392	7651	Selliera radicans	1	Scrambling, prostrate herbaceous perennial with fleshy bright green leaves and adventitious roots. Flowers (not seen) and fruiting capsules held on a long peduncle. Capsules hold multiple winged seeds that become mucilaginous on wetting. Plants may be cl	Landform: estuarine. Soil type: sand. Parent material: sandstone.	Estuarine. Assoc. sp.: Juncus krausii, Melaleuca spp., Banksia seminuda and Apium prostratum.	100 + plants.	Plants are larger than those at the mouth of the Hay River, with smaller leaves. They are more exposed to weather. More fruit produced.	Crusoe Beach, E of Denmark. Population is W of main beach above rocky shoreline extending about 20 m back behind waterline. S facing	GPS	1	6/05/2002

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
43449	8082359	7651	Selliera radicans	1	Prostrate herb 2 cm to 20 cm high x 2 m to 4 m wide. Fleshy bright green leaves.	Outcrop. Inlet. Seasonally inundated. Moist red/brown/black sand/laterite/ granite.	Woodland/herbland/ sedgeland. With Melaleuca preissiana, Melaleuca cuticularis, Sarcocornia blackiana, Isolepis nodosa, Villarsia parnassifolia, dense sedge land.	abundant - 1000+ plants.		Denmark - Porpoise Rock or Poison Point, ca 1 km E from Campbell Road - Inlet drive junction at bottom of an old fishermans track	GPS	1	17/01/2006
43451	8131546	7651	Selliera radicans	1	Prostrate herb < 5 cm high.	Flat shoreline. White-brown sand.		occasional.		W end Crusoe Beach on Crusoe Beach Road from South Coast Highway, E of Denmark	GPS	1	25/11/2004
43452	5119677	7651	Selliera radicans	1	Rhizomatous perennial herb to 5 cm tall x 1-2 m wide. Flowers inconspicuous, creamy yellow. In full flower.	Edging brackish inlet. Wet brown sandy clay over granite.	Melaleuca cuticularis low open woodland.			Honeymoon Island, Wilson Inlet, Denmark,	MAN	0	21/01/1991
43453	4921542	7651	Selliera radicans	1	Prostrate stems rooting at nodes. Leaves erect, semi-succulent. Remains of only two spent flowers found in numerous plants. Pedicels 1 cm.	Low lying, seasonally wet area on the edge of inlet. In soil pockets on broken granite.	Neurachne sp., Isolepis nodosa, Villarsia parnassifolia, Atriplex hypoleuca.		Abundance: recurring over distance of 2 km. More prevalent where associated vegetation is less dense.	Wilson Inlet, adjacent to N boundary of Wilson Inlet Holiday Park,	GPS	1	27/03/1997
45877	4048555	30272	Stylidium sp. Kordabup (A.R. Annels 1660)	1	Tall, slender, clumped, trigger plant to 30 cm; leaves whorled at nodes, also rooting at nodes; flowers pale pink to yellow, no throat markings.	In granite outcrop in shallow soil.	With Eucalyptus marginata and Xanthorrhoea preissii.			Karma Chalets, 7 km WSW of Denmark on Lapkos Road, off South Coast Highway	MAN	0	21/10/1994
46585	4263391	16859	Synaphea incurva	3	2-3 ft, yellow flower.					Denmark	AUTO	3	26/09/1972

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
47746	4131053	35578	Tetraria sp. Blackwood River (A.R. Annels 3043)	3	Rush growing in water on drainage line.	Valley floor.	Eucalyptus diversicolor, Lepidosperma tetraquetrum, L. effusum, Callistachyus lanceolotus.	common.		4.7 km WNW of Denmark, approximately 100 m S of Glenrowan road on Turner Road, NE corner of Gravel Reserve 13255,	TOPO	2	30/08/1995
47750	2334054	35578	Tetraria sp. Blackwood River (A.R. Annels 3043)	3	Native.		Bush.			Near Brooklyn Park Farm [near] Denmark, Warren	AUTO	3	21/02/1979
48470	5519446	5096	Thomasia quercifolia	4	Woody dwarf shrubs 10 to 30 cms high. Flowers pink.	Limestone slope in coastal dunes. Overburden mechanically cleared many years ago leaving very shallow sand pockets on limestone.	Very sparse dwarf scrub. Assoc. with dwarf forms of Acacia littorea, Dryandra sessilis & Pultenaea reticulata.	ca 100 plants scattered over 0.5 ha.		Denmark Shire. Ocean Beach Reserve c. 300 m NE of existing limestone quarry & outside current mining lease.	GPS	1	28/10/1999
48473	5796245	5096	Thomasia quercifolia	4	Woody, spreading shrub to 0.8 m high. Flowers faded, many with seed.	In shallow sand pockets on surface limestone.	In dwarf scrub with Spyridium globulosum, Acacia littorea and Dryandra sessilis.	occasional in a restricted area.		Denmark Shire. Around the Limestone Quarry at Ocean Beach. Same area as previous collection B.G.Hammersley 2164.	GPS	0	10/02/2000
48474	5519454	5096	Thomasia quercifolia	4	Spindly shrub straggling up through thicket to height of 1.5 m. Flowers pink.	Sand over limestone on the lower section of limestone slope in coastal dunes close to watercourse.	Thicket of Spyridium globulosum, Acacia littorea, Pultenaea reticulata & Acrotriche cordata.	ca 100 plants scattered over 0.25 ha.		Denmark Shire. Ocean Beach Reserve c. 300 m NE of existing limestone quarry & outside current mining lease.	GPS	1	28/10/1999

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
48478	5503272	5096	Thomasia quercifolia	4	Spreading woody shrub up to 0.8 m high by 1.5 m wide. Not in flower.	In shallow sand pockets on exposed limestone only. Not found in adjacent areas of deeper coastal sand.	In open low scrub surrounded by thicket. Assoc. with Desmocladus flexuosus, Spyridium globulosum, Acacia littorea & Hakea oleifolia.	dominant on tracks and in open areas. ca 500 plants.		Denmark Shire. Ocean Beach Reserve, close to existing Limestone Quarry and within the zone of Shire's application for a mining lease.	GPS	1	5/05/1999
48479	8244448	5096	Thomasia quercifolia	4	Prostrate shrub to 0.5 m high x 0.5 m wide. Flowers pink - purple.	Ridge. Dry grey soil. Old soil disturbance. Shire reserve - lime quarry. Fire history unknown.	Coastal heath - low shrubland. Spyridium globulosum, Acacia littorea, Desmocladus flexuosa, Olax phyllanthi, Leucopogon parviflorus.	21-50 plants including seedlings.		On western boundary fenceline, old 4 Wheel Drive track, break of existing limestone quarry, Ocean Beach - Denmark	GPS	1	27/04/2010
48480	8244456	5096	Thomasia quercifolia	4	Prostrate shrub 0.5 m high x 0.5 m wide. Flowers pink - purple.	Cliff, limestone carst. Dry grey soil. Old soil disturbance. Fire history unknown.	Coastal heath - low shrubland. Scaevola crassifolia, Dryandra sessilis, Hibbertia sp., Olax phylanthi, Platysace sp., Spyridium globulosum.	21-50 plants.	Percentage of population in bud 40%, flowering 60%.	SW of lime quarry on W boundary of Lime Quarry Lease, on old 4WD track fire break boundary edge of cliff, Reserve No's. 46273, 24913, Ocean Beach - Denmark	GPS	1	27/04/2010
48499	4148185	5100	Thomasia solanacea	4	1 m plant, flowers pink.	Rocky loam.	In association with Acacia and Eucalyptus.		This specimen is housed at Albany.	Inlet Road, Denmark,	MAN	0	17/09/1990
52131	6152511	18453	Xanthosia eichleri	4	Erect herbs to 0.1 m high.	Gravelly sand.	Jarrah-Marri forest with Xanthosia rotundifolia, Pentapeltis silvatica, Platysace compressa, Pimelea and tea tree.	abundant.		Corner of Nornalup and Break roads, c. 30 km NW of Denmark	MAN	3	8/11/1995

FID	Sheet	NameID	Taxon	Cons_ Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Geo_ Method	Precision	Date
52140	6904017	18453	Xanthosia eichleri	4		Slope. Dry, yellow-grey sand, gravel.	Open woodland - closed heath. Adenanthos cuneatus, Daviesia sp., Agonis parviceps.	50 plants over .05 ha.		South Coast Highway, ca 5.65 km E of Denmark River Bridge, on both side of highway	GPS	1	29/11/2001
52156	7483724	18453	Xanthosia eichleri	4		Outcrop. Dry, brown sand. Sheet rock.	Open sedgeland and herbland. Lepidosperma gladiatum, Patersonia occidentalis, Neurachne alopecuroidea, Chamaescilla corymbosa.	20 mature plants.		Loc. 2077, Ocean Beach Road, Shire of Denmark	GPS	1	26/11/2005

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	Location	District	Vesting	Purpose1	Purpose2	CountDate	Method	MatureCoun	SeedlingCo	LiveTotal	inFlower
2200	94364	41741	Andersonia sp. Virolens (G.J. Keighery 12000)	3		5		Mt Lindesay NP (47891). Mt. Lindesay. On walk track, ca. 100m below summit. Denmark.	FRANKLAND	CC	NPK		16/09/1994 0:00		0		0	N
2383	103320	16321	Anthocercis sylvicola	3		10	B	Mount Hallowell Reserve (46618). Loc. 8065. Bibbulmun Track, Ocean Beach side of Mt Hallowell. Ca. 400-500m from wooden sign post on Mt Hallowell. Both sides of track. Denmark	FRANKLAND	LGA	REC	NRE	22/04/2007 0:00	ESTMT	28		28	N
3977	87095	4447	Boronia virgata	4		8		Track of Proctor Road, off Lights Road, road reserve on the way to William Bay National Park	FRANKLAND	LGA	VER		16/10/1992 0:00	ESTMT	0		100	Y
3979	87084	4447	Boronia virgata	4		10		William Bay National Park - peat swamps in North east corner north of Lake Williams.	FRANKLAND	CC	NPK		11/11/2000 0:00		0		0	N
3988	87089	4447	Boronia virgata	4		17		ca. 0.4 km E of Mt Lindesay Rd, on unnamed track which is ca. 0.5 km N of Churchill Rd. Denmark Catchment SF.	FRANKLAND	CC	FOR		17/10/2001 0:00	ESTMT	100	0	100	Y
4033	84639	1270	Borya longiscapa	3		30		Mt Lindesay NP (47891). Stan Rd, track W to granite peak. Senmark State Forest. Denmark.	FRANKLAND	LGA	VER		24/09/1992 0:00		0		0	N
7479	98326	3096	Drosera fimbriata	4		3	A	William Bay NPk. Sandtrack from E boundary to Lake Williams.	FRANKLAND	CC	NPK	WAT	11/11/2000 0:00	ESTMT	0		10	Y
7480	98327	3096	Drosera fimbriata	4		3	B	William Bay NPk. Lake Williams. Granite which forms eastern margin of lake and on adjacent moss pads.	ALBANY	CC	NPK	WAT	11/11/2000 0:00		0		0	Y

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	Location	District	Vesting	Purpose1	Purpose2	CountDate	Method	MatureCoun	SeedlingCo	LiveTotal	inFlower
9172	104177	19629	Eucalyptus virginea	4		3	A	Lot 1 (Location 414) Lapkos Rd, Denmark. Ca. 2 km SE of Mt Shadforth. NB: Lot 1 Lapkos Rd is part Location 414 and Location 420.	FRANKLAND	PRI			28/01/1993 0:00	ACT_IND	6		6	Y
9173	104178	19629	Eucalyptus virginea	4		3	B	Lot 1 (Location 420) Lapkos Rd, Denmark. Ca. 2 km SE of Mt Shadforth. NB: Lot 1 is part Location 414 and Location 420.	FRANKLAND	PRI			28/01/1993 0:00	ACT_IND	6		6	Y
12071	98944	4039	Kennedia glabrata	T	VU	7	A	William Bay NP, granite outcrop on E margin of Lake Williams.	FRANKLAND	CC	NPK		21/12/2010 0:00	ACT_IND	0	38	0	N
12072	98945	4039	Kennedia glabrata	T	VU	7	B	Northern boundary of William Bay NP and Location 7075, SW corner of PP & NP.	FRANKLAND	CC	NPK		12/09/2008 0:00	ACT_IND	11	5	0	N
12456	105110	33498	Lasiopetalum sp. Denmark (B.G. Hammersley 2012)	3		29	A	UCL. Kernutt's Rdto 180m N, ca. 3.5km from Denmark-Mt Barker Rd at entrance to old saw mill site & in adjacent [UCL]. Adjacent to SW cnr of Loc 6710. Denmark.	FRANKLAND	NON	UCL		1/11/2005 0:00	ESTMT	5000	100	5000	Y
12457	105111	33498	Lasiopetalum sp. Denmark (B.G. Hammersley 2012)	3		29	B	Road Verge. Kernutt's Rd, ca. 3.5km from Denmark-Mt Barker Rd at entrance to old saw mill site & in adjacent [UCL]. Denmark.	FRANKLAND	LGA	VER		19/09/1998 0:00	ESTMT	100		100	Y
14611	94570	19062	Pleurophascum occidentale	4		25		Mt. Hallowell Nature Reserve no. 46618 on the southern side of the old track to Monkey Rock ca.25m from the Lights Rd.carpark.	FRANKLAND	LGA	CON		7/07/2003 0:00	ESTMT	20		20	N
15236	100499	7651	Selliera radicans	1		1	A	UCL. Carusoe beach, at jetty 50m E along shoreline before island. Denmark.	FRANKLAND	NON	UCL	FP	16/02/2007 0:00	ESTMT	40		40	N

FID	PopId	Nameid	Taxon	ConsStatus	WARank	PopNumber	SubPopCode	Location	District	Vesting	Purpose1	Purpose2	CountDate	Method	MatureCoun	SeedlingCo	LiveTotal	inFlower
15237	100500	7651	Selliera radicans	1		1	B	UCL. Carusoe Beach. ca. 300m W of jetty on W end of beach where laterite starts. Another small patch ca. 50m W of jetty along beach under Melaleucas. Denmark.	FRANKLAND	NON	UCL		16/02/2007 0:00	ESTMT	1400		1400	N
15238	100501	7651	Selliera radicans	1		1	C	UCL. Curosoe beach, W of jetty 250 W along shoreline from most W access (steps to inlet). Denmark.	FRANKLAND	NON	UCL		14/01/2004 0:00	ESTMT	0		0	N
15240	89244	7651	Selliera radicans	1		3		Shire Reserve (25797). Honeymoon Island, Wilson Inlet, Denmark.	FRANKLAND	LGA	REC		21/01/1991 0:00		0		0	Y
15241	89245	7651	Selliera radicans	1		4		Shire Reserve (34742). Wilson Inlet (Loc. No. 744) Just E of old Wilson Inlet Holiday Park to Honeymoon Island. Also at boat launch on cnr of Campbell Rd & Inlet Drv in small patch. Denmark.	FRANKLAND	LGA	REC		28/02/2007 0:00	ESTMT	200		200	N
15242	89246	7651	Selliera radicans	1		5		Shire Reserve (12344). ca. 1km E from Campbell Rd-Inlet Drv junc at bottom of old fishermans track. Poisson pt. Porpoise Rock & at boat launch on cnr of Campbell Rd & Inlet Drv. Denmark.	FRANKLAND	LGA	REC		16/02/2007 0:00		600		600	N
16470	99277	5096	Thomasia quercifolia	4		2	A	Crown Reserve (42673), ca.0.7km SW of Ocean Beach near Limestone Quarry wihtin mininglease application. Denmark.	FRANKLAND	CRW	MIN		10/02/2000 0:00		0		0	N
16471	99278	5096	Thomasia quercifolia	4		2	B	Shire Res (24913), SW of Ocean Beach ca. 300m NE of Limestone Quarry outside current mining lease. Denmark.	FRANKLAND	LGA	PAR	REC	28/10/1999 0:00	ESTMT	100		100	Y

APPENDIX 3

Naturemap Report

NatureMap Species Report

Created By Guest user on 09/11/2020

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	117° 20' 34" E,34° 57' 04" S
Buffer	10km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	1376	9459
Other specially protected fauna	2	10
Priority 1	2	16
Priority 2	4	5
Priority 3	13	38
Priority 4	18	105
Protected under international agreement	17	437
Rare or likely to become extinct	24	227
TOTAL	**1456**	**10297**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	41326	*Ardenna carneipes (Flesh-footed Shearwater, Fleshy-footed Shearwater)*		T	
2.	24358	*Atrichornis clamosus (Noisy Scrub-bird, tjimiluk)*		T	
3.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
4.	24790	*Calidris tenuirostris (Great Knot)*		T	
5.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
6.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
7.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
8.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
9.	25335	*Caretta caretta (Loggerhead Turtle)*		T	
10.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		T	
11.	43347	*Cynotelopus notabilis (Western Australian Pill Millipede)*		T	
12.	24440	*Dasyornis longirostris (Western Bristlebird)*		T	
13.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
14.	13635	*Drakaea micrantha*		T	
15.	34026	*Galaxiella munda (mud minnow, western dwarf galaxias)*		T	
16.	13084	*Grevillea fuscolutea*		T	
17.	4039	*Kennedia glabrata (Northcliffe Kennedia)*		T	
18.	24557	*Leipoa ocellata (Malleefowl)*		T	
19.	34033	*Nannatherina balstoni (Balston's Pygmy Perch)*		T	
20.	24210	*Neophoca cinerea (Australian Sea-lion)*		T	
21.	24715	*Puffinus huttoni (Hutton's Shearwater)*		T	
22.	24145	*Setonix brachyurus (Quokka)*		T	
23.	34007	*Thalassarche chlororhynchos (Atlantic Yellow-nosed Albatross)*		T	
24.	42361	*Zephyrarchaea mainae (Main's assasin spider)*		T	
Protected under international agreement					
25.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
26.	41328	*Ardenna tenuirostris (Short-tailed Shearwater)*		IA	
27.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
28.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
29.	24780	*Calidris alba (Sanderling)*		IA	
30.	25738	*Calidris canutus (Red Knot, knot)*		IA	
31.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
32.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
33.	41332	*Chlidonias leucopterus (White-winged Black Tern, white-winged tern)*		IA	
34.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
35.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
36.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
37.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
38.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
39.	25642	*Sterna hirundo (Common Tern)*		IA	
40.	48597	*Thalasseus bergii (Crested Tern)*		IA	
41.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Other specially protected fauna					
42.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
43.	48070	*Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)*		S	
Priority 1					
44.	7651	*Selliera radicans*		P1	
45.	30272	*Stylidium sp. Kordabup (A.R. Annels 1660)*		P1	
Priority 2					
46.	15329	*Caladenia applanata subsp. erubescens*		P2	
47.	25290	*Elapognathus minor (Short-nosed Snake)*		P2	
48.	24347	*Ixobrychus flavicollis subsp. australis (Black Bittern (southwest subpop.), Australian Black Bittern)*		P2	
49.	37683	*Melaleuca viminalis*		P2	
Priority 3					
50.	45013	*Amanita drummondii*		P3	
51.	6301	*Andersonia auriculata*		P3	
52.	41730	*Andersonia sp. Amabile (N. Gibson & M. Lyons 355)*		P3	
53.	16997	*Andersonia sp. Mitchell River (B.G. Hammersley 925)*		P3	
54.	41741	*Andersonia sp. Virolens (G.J. Keighery 12000)*		P3	
55.	7829	*Angianthus drummondii*		P3	
56.	16321	*Anthocercis sylvicola*		P3	
57.	1270	*Borya longiscapa*		P3	
58.	34030	*Geotria australis (Pouched Lamprey)*		P3	
59.	33498	*Lasiopetalum sp. Denmark (B.G. Hammersley 2012)*		P3	
60.	6355	*Leucopogon alternifolius*		P3	
61.	16859	*Synaphea incurva*		P3	
62.	35578	*Tetraria sp. Blackwood River (A.R. Annels 3043)*		P3	
Priority 4					
63.	32084	*Banksia serra (Serrate-leaved Dryandra)*		P4	
64.	32078	*Banksia sessilis var. cordata*		P4	
65.	4447	*Boronia virgata*		P4	
66.	3096	*Drosera fimbriata (Manypeaks Sundew)*		P4	
67.	19629	*Eucalyptus virginea*		P4	
68.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
69.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
70.	3042	*Lepidium pseudotasmanicum*		P4	
71.	1662	*Microtis pulchella (Beautiful Mignonette Orchid)*		P4	
72.	48022	*Notamacropus irma (Western Brush Wallaby)*		P4	
73.	36200	*Ornduffia submersa*		P4	
74.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
75.	19062	*Pleurophascum occidentale*		P4	
76.	48135	*Thinornis rubricollis (Hooded Plover, Hooded Dotterel)*		P4	
77.	5096	*Thomasia quercifolia (Oak Leaved Thomasia)*		P4	
78.	5100	*Thomasia solanacea*		P4	
79.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
80.	18453	*Xanthosia eichleri*		P4	
Non-conservation taxon					
81.		*? ?*			
82.	15429	*Acacia alata var. alata*			
83.	15466	*Acacia applanata*			
84.	11731	*Acacia browniana var. browniana*			
85.	3262	*Acacia cochlearis (Rigid Wattle)*			
86.	3282	*Acacia cyclops (Coastal Wattle)*			
87.	3307	*Acacia divergens*			
88.	3347	*Acacia gilbertii*			
89.	3363	*Acacia hastulata*			
90.	18217	*Acacia iteaphylla*	Y		
91.	3424	*Acacia littorea*			
92.	3428	*Acacia luteola*			
93.	3453	*Acacia myrtifolia*			
94.	35624	*Acacia pentadenia subsp. pentadenia*			
95.	3496	*Acacia preissiana*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
96.		*Acacia provincialis*			Y
97.	3502	*Acacia pulchella (Prickly Moses)*			
98.	15483	*Acacia pulchella var. pulchella*			
99.	30036	*Acacia saligna subsp. stolonifera*			
100.	3530	*Acacia scalpelliformis*			
101.	3576	*Acacia tetragonocarpa*			
102.	3591	*Acacia urophylla*			
103.	15487	*Acacia varia var. varia*			
104.	3185	*Acaena novae-zelandiae*	Y		
105.		*Acanthaluteres brownii*			
106.		*Acanthistius serratus*			
107.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
108.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
109.	24262	*Acanthiza inornata (Western Thornbill)*			
110.		*Acanthopagrus butcheri*			
111.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
112.		*Acariformes sp.*			
113.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
114.	24281	*Accipiter cirrocephalus subsp. cirrocephalus (Collared Sparrowhawk)*			
115.	25536	*Accipiter fasciatus (Brown Goshawk)*			
116.	13146	*Acetabularia peniculus*			
117.		*Achoerodus gouldii*			
118.	10824	*Acidonia microcarpa*			
119.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
120.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
121.	6295	*Acrotriche cordata (Coast Ground Berry)*			
122.	5315	*Actinodium cunninghamii (Albany Daisy)*			
123.	6206	*Actinotus omnifertilis*			
124.	1773	*Adenanthos cuneatus (Coastal Jugflower)*			
125.	1791	*Adenanthos obovatus (Basket Flower)*			
126.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
127.	24301	*Aegotheles cristatus subsp. cristatus (Australian Owlet-nightjar)*			
128.		*Aeshnidae sp.*			
129.		*Agaricus augustus*			Y
130.	38752	*Agaricus campestris*			
131.		*Agaricus sp.*			
132.		*Agaricus xanthodermus*			
133.	5316	*Agonis flexuosa (Peppermint, Wonil)*			
134.	17202	*Agonis flexuosa var. flexuosa*			
135.	17203	*Agonis flexuosa var. latifolia*			
136.	19789	*Agonis theiformis*			
137.	177	*Agrostis capillaris*	Y		
138.	182	*Agrostis stolonifera (Creeping Bent)*	Y		
139.	185	*Aira cupaniana (Silvery Hairgrass)*	Y		
140.	187	*Aira praecox (Early Hairgrass)*	Y		
141.		*Akamptogonus novarae*			
142.		*Aldrichetta forsteri*			
143.	1724	*Allocasuarina decussata (Karri She-oak)*			
144.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
145.	48599	*Amanita arenaria*			
146.		*Amanita austroviridis*			
147.	48786	*Amanita hiltonii*			
148.	38756	*Amanita umbrinella*			
149.	38757	*Amanita xanthocephala*			
150.		*Ambicodamus marae*			
151.	35159	*Ammophila arenaria subsp. arenaria*	Y		
152.		*Ammotretis rostratus*			
153.	4585	*Amperea ericoides*			
154.	13101	*Amperea simulans*			
155.	13380	*Amphibromus nervosus*			
156.	194	*Amphipogon amphipogonoides*			
157.	197	*Amphipogon debilis*			
158.	20184	*Amphipogon laguroides subsp. laguroides*			
159.		*Aname tepperi*			
160.	1058	*Anarthria gracilis*			
161.	1062	*Anarthria prolifera*			
162.	1063	*Anarthria scabra*			
163.	24310	*Anas castanea (Chestnut Teal)*			
164.	24312	*Anas gracilis (Grey Teal)*			
165.	24313	*Anas platyrhynchos (Mallard)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
166.	24315	*Anas rhynchotis (Australasian Shoveler)*			
167.	24316	*Anas superciliosa (Pacific Black Duck)*			
168.	6306	*Andersonia caerulea (Foxtails)*			
169.	25844	*Andersonia caerulea subsp. caerulea*			
170.	6317	*Andersonia micrantha*			
171.	6321	*Andersonia sprengelioides*			
172.	8616	*Angianthus platycephalus*			
173.	7833	*Angianthus preissianus*			
174.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
175.	1407	*Anigozanthos flavidus (Tall Kangaroo Paw)*			
176.	1413	*Anigozanthos preissii (Albany Catspaw)*			
177.	17455	*Anredera cordifolia*	Y		
178.	6949	*Anthocercis littorea (Yellow Tailflower)*			
179.		*Anthoceros punctatus*			
180.	24561	*Anthochaera carunculata (Red Wattlebird)*			
181.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
182.	7411	*Anthotium humile (Dwarf Anthotium)*			
183.	202	*Anthoxanthum odoratum (Sweet Vernal Grass)*	Y		
184.	38758	*Anthracophyllum archeri*			
185.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
186.	3689	*Aotus intermedia*			
187.	3690	*Aotus passerinoides*			
188.	1117	*Aphelia cyperoides*			
189.		*Aphroteniinae sp.*			
190.	11399	*Apium prostratum subsp. prostratum var. filiforme*			
191.		*Aplodactylus westralis*			
192.	24285	*Aquila audax (Wedge-tailed Eagle)*			
193.		*Arachnura higginsi*			
194.		*Araneus cyphoxis*			
195.		*Araneus senicaudatus*			
196.	38964	*Arcyria cinerea*			
197.	25558	*Ardea ibis (Cattle Egret)*			
198.	41324	*Ardea modesta (great egret, white egret)*			
199.	24341	*Ardea pacifica (White-necked Heron)*			
200.		*Arius thalassinus*			
201.	11542	*Arrhenatherum elatius var. bulbosum (Onion Twitch)*	Y		
202.		*Arripis georgiana*			
203.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
204.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
205.	27584	*Arthonia ilicina*			
206.		*Artoria cingulipes*			
207.		*Artoria flavimana*			
208.		*Aseroe rubra*			Y
209.	8779	*Asparagus asparagoides (Bridal Creeper)*	Y		
210.	24020	*Asparagus scandens*	Y		
211.	61	*Asplenium aethiopicum (Forked Spleenwort)*			
212.	20361	*Astartea arbuscula (Minute Astartea)*			
213.	48190	*Astartea arbuscula x corniculata*			Y
214.	20125	*Astartea corniculata*			
215.	20127	*Astartea glomerulosa (Early Astartea)*			
216.	45213	*Astartea pulchella*			
217.	20283	*Astartea scoparia (Common Astartea)*			
218.		*Asterella drummondii*			
219.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
220.		*Asterostroma persimile*			
221.	6325	*Astroloma drummondii*			
222.		*Atelomastix ellenae*			
223.		*Atelomastix francesae*			
224.		*Atelomastix mainae*			
225.		*Athericidae sp.*			
226.		*Atherinosoma elongata*			
227.		*Atherinosoma wallacei*			
228.		*Atriplectididae sp.*			
229.	48559	*Auritella arenicolens*			
230.	48560	*Auritella chamaecephala*			
231.		*Austracantha minax*			
232.		*Australomimetus diabolicus*			
233.		*Austroboletus lacunosus*			
234.		*Austroboletus occidentalis*			
235.		*Austrogautieria manjimupana*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
236.	42106	*Austroparmelina conlabrosa*			
237.	17240	*Austrostipa flavescens*			
238.	17241	*Austrostipa hemipogon*			
239.	17245	*Austrostipa mollis*			
240.	17253	*Austrostipa semibarbata*			
241.		*Austrosynthemis cyanitincta*			
242.	231	*Avellinia michelii*	Y		
243.	233	*Avena barbata (Bearded Oat)*	Y		
244.	20013	*Axonopus fissifolius*	Y		
245.	24318	*Aythya australis (Hardhead)*			
246.		*Badumna microps*			
247.		*Baetidae sp.*			
248.		*Baiami tegenarioides*			
249.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
250.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
251.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
252.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
253.	1837	*Banksia occidentalis (Red Swamp Banksia)*			
254.	1844	*Banksia quercifolia (Oak-leaved Banksia)*			
255.	1848	*Banksia seminuda (River Banksia)*			
256.	32315	*Barbula calycina*			
257.		*Barnardius zonarius*			
258.	739	*Baumea acuta (Pale Twig-rush)*			
259.	741	*Baumea articulata (Jointed Rush)*			
260.	743	*Baumea juncea (Bare Twigrush)*			
261.	744	*Baumea laxa*			
262.	745	*Baumea preissii*			
263.	747	*Baumea rubiginosa*			
264.	748	*Baumea vaginalis (Sheath Twigrush)*			
265.	1212	*Baxteria australis*			
266.	5381	*Beaufortia decussata (Gravel Bottlebrush)*			
267.	5392	*Beaufortia sparsa (Swamp Bottlebrush)*			
268.	48868	*Bellardia viscosa*	Y		
269.	3154	*Billardiera coriacea*			
270.	25787	*Billardiera drummondii*			
271.	3157	*Billardiera floribunda (White-flowered Billardiera)*			
272.	25798	*Billardiera fusiformis (Australian Bluebell)*			
273.	3159	*Billardiera laxiflora*			
274.	3165	*Billardiera variifolia*			
275.	24319	*Biziura lobata (Musk Duck)*			
276.	46074	*Boletellus ananiceps*			
277.		*Boletellus obscurecoccineus*			
278.	46075	*Boletellus sinapipes*			
279.		*Boletus sp.*			
280.	4413	*Boronia crenulata (Aniseed Boronia)*			
281.	11503	*Boronia crenulata subsp. crenulata var. crenulata*			
282.	4416	*Boronia denticulata*			
283.	4422	*Boronia gracilipes (Karri Boronia)*			
284.	4423	*Boronia heterophylla (Kalgan Boronia)*			
285.	4426	*Boronia juncea*			
286.	16631	*Boronia juncea subsp. micrantha*			
287.	4429	*Boronia molloyae (Tall Boronia)*			
288.	4430	*Boronia nematophylla*			
289.	4441	*Boronia spathulata (Boronia)*			
290.	4442	*Boronia stricta*			
291.	4443	*Boronia subsessilis*			
292.	1273	*Borya sphaerocephala (Pincushions)*			
293.	14396	*Bossiaea aquifolium subsp. aquifolium*			
294.	14397	*Bossiaea aquifolium subsp. laidlawiana*			
295.	3707	*Bossiaea dentata*			
296.	3713	*Bossiaea linophylla*			
297.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
298.	14291	*Bossiaea praetermissa*			
299.	3718	*Bossiaea rufa*			
300.	3723	*Bossiaea webbii (Water Bush)*			
301.	7871	*Brachyscome ciliaris*			
302.		*Brentidae sp.*			
303.	32327	*Breutelia affinis*			
304.	244	*Briza maxima (Blowfly Grass)*	Y		
305.	245	*Briza minor (Shivery Grass)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
306.	248	*Bromus catharticus (Prairie Grass)*	Y		
307.	32330	*Bryum argenteum*			
308.	27597	*Buellia disciformis*			
309.	34461	*Buellia tetrapla*			
310.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
311.	25713	*Cacatua galerita (Sulphur-crested Cockatoo)*			
312.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
313.	25716	*Cacatua sanguinea (Little Corella)*			
314.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
315.	24427	*Cacomantis flabelliformis subsp. flabelliformis (Fan-tailed Cuckoo)*			
316.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
317.		*Caenidae sp.*			
318.	15328	*Caladenia applanata subsp. applanata*			
319.	15335	*Caladenia brownii*			
320.	1580	*Caladenia cairnsiana (Zebra Orchid)*			
321.	15350	*Caladenia flava subsp. sylvestris*			
322.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
323.	15372	*Caladenia nana subsp. unita*			
324.	1609	*Caladenia pectinata (King Spider Orchid)*			
325.	2845	*Calandrinia brevipedata (Short-stalked Purslane)*			
326.	2856	*Calandrinia liniflora (Parakeelya)*			
327.	10861	*Callistachys lanceolata (Wonnich)*			
328.	5394	*Callistemon glaucus*			
329.		*Callogobius mucosus*			
330.	31015	*Caloplaca elixii*			
331.		*Caloplaca sp.*			
332.	5415	*Calothamnus lateralis*			
333.	5425	*Calothamnus preissii*			
334.	5430	*Calothamnus schaueri*			
335.	16493	*Calycopeplus oligandrus*			
336.		*Calymmachernes angulatus*			
337.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
338.	5483	*Calytrix tetragona (Common Fringe-myrtle)*			
339.	32335	*Campylopus bicolor*			
340.	32461	*Campylopus bicolor var. bicolor*			
341.	32338	*Campylopus introflexus*	Y		
342.		*Cantharellus concinnus*			
343.	7909	*Carduus pycnocephalus (Slender Thistle)*	Y		
344.	2956	*Cassytha pomiformis (Dodder Laurel)*			
345.	2957	*Cassytha racemosa (Dodder Laurel)*			
346.	11799	*Cassytha racemosa forma racemosa*			
347.		*Castoreum radicatum*			
348.		*Ceinidae sp.*			
349.	41564	*Cenchrus clandestinus (Kikuyu Grass)*	Y		
350.	6539	*Centaurium erythraea (Common Centaury)*	Y		
351.	6214	*Centella asiatica*			
352.	35322	*Centranthus ruber subsp. ruber*	Y		
353.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
354.	1133	*Centrolepis pilosa*			
355.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
356.		*Cephaloziella exiliflora*			
357.		*Cephaloziella hirta*			
358.		*Cephaloziella varians*			
359.	13119	*Cerastium balearicum*	Y		
360.	38982	*Ceratiomyxa fruticulosa*			
361.	32462	*Ceratodon purpureus subsp. convolutus*			
362.		*Ceratopogonidae sp.*			
363.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
364.		*Cercophonius granulosus*			
365.		*Cercophonius sulcatus*			
366.		*Chaetophyllopsis whiteleggei*			
367.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
368.	1280	*Chamaescilla corymbosa (Blue Squill)*			
369.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
370.		*Cheilodactylus gibbosus*			
371.		*Chelidonichthys kumu*			
372.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
373.	2483	*Chenopodium album (Fat Hen)*	Y		
374.	2494	*Chenopodium murale (Nettle-leaf Goosefoot)*	Y		
375.	33939	*Cherax cainii (Marron)*			

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376.		*Cherax preissii*			
377.		*Cherax quinquecarinatus*			
378.		*Chiloscyphus semiteres*			
379.		*Chiloscyphus semiteres var. semiteres*			
380.		*Chironominae sp.*			
381.		*Chlorophyllum brunneum*			
382.	2335	*Choretrum lateriflorum (Dwarf Sour Bush)*			
383.	4448	*Chorilaena quercifolia (Chorilaena)*			
384.	763	*Chorizandra enodis (Black Bristlerush)*			
385.	13112	*Chorizema aciculare subsp. aciculare*			
386.	3754	*Chorizema diversifolium*			
387.	3757	*Chorizema glycinifolium*			
388.	3758	*Chorizema ilicifolium (Holly Flame Pea)*			
389.	3760	*Chorizema reticulatum (Showy Flame Pea)*			
390.	13107	*Chorizema retrorsum*			
391.	3761	*Chorizema rhombeum*			
392.	24980	*Christinus marmoratus (Marbled Gecko)*			
393.		*Chroicocephalus novaehollandiae*			
394.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
395.	24288	*Circus approximans (Swamp Harrier)*			
396.	7937	*Cirsium vulgare (Spear Thistle, Scotch Thistle)*	Y		
397.	27663	*Cladia aggregata*			
398.	27668	*Cladia schizopora*			
399.	27669	*Cladia sullivanii*			
400.	28208	*Cladonia cervicornis subsp. verticillata*			
401.	27680	*Cladonia floerkeana*			
402.	27681	*Cladonia glebosa*			
403.	27684	*Cladonia krempelhuberi*			
404.	27688	*Cladonia ochrochlora*			
405.	27690	*Cladonia praetermissa*			
406.	27691	*Cladonia ramulosa*			
407.	27692	*Cladonia rigida*			
408.	27693	*Cladonia scabriuscula*			
409.	27694	*Cladonia southlandica*			
410.	27697	*Cladonia tessellata*			
411.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
412.		*Clavaria miniata*			
413.		*Claviceps purpurea*			
414.	2929	*Clematis pubescens (Common Clematis)*			
415.		*Cnidoglanis macrocephalus*			
416.		*Coenagrionidae sp.*			
417.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
418.	24613	*Colluricincla harmonica subsp. rufiventris (Grey Shrike-thrush)*			
419.	24399	*Columba livia (Domestic Pigeon)*	Y		
420.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
421.	4552	*Comesperma confertum*			
422.	4554	*Comesperma flavum*			
423.	4564	*Comesperma virgatum (Milkwort)*			
424.	48634	*Commersonia corniculata*			
425.	40863	*Commersonia corylifolia (Hazel-leaved Rulingia)*			
426.		*Conger wilsoni*			
427.		*Conicochernes crassus*			
428.		*Conicochernes globosus*			
429.	1862	*Conospermum caeruleum (Blue Brother)*			
430.	15610	*Conospermum caeruleum subsp. caeruleum*			
431.	1863	*Conospermum capitatum*			
432.	1883	*Conospermum teretifolium (Spider Smokebush)*			
433.	11826	*Conostylis aculeata subsp. aculeata*			
434.	1454	*Conostylis setigera (Bristly Cottonhead)*			
435.		*Contusus brevicaudus*			
436.	20074	*Conyza sumatrensis*	Y		
437.		*Coprinellus disseminatus*			
438.		*Coprinellus micaceus*			
439.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
440.	24362	*Coracina novaehollandiae subsp. novaehollandiae (Black-faced Cuckoo-shrike)*			
441.		*Corduliidae sp.*			
442.	44528	*Coreopsis lanceolata (Common Tickseed, Showy Tickseed, Garden Coreopsis)*	Y		
443.		*Corixidae sp.*			
444.		*Cormocephalus hartmeyeri*			
445.		*Cormocephalus michaelseni*			

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446.	2891	*Corrigiola litoralis (Strapwort)*	Y		
447.	41681	*Cortinarius basipurpureus*			
448.		*Cortinarius basirubescens*			
449.		*Cortinarius clelandii*			
450.	48174	*Cortinarius hallowellensis*			
451.		*Cortinarius lavendulensis*			
452.	38776	*Cortinarius phalarus*			
453.		*Cortinarius rotundisporus*			
454.		*Cortinarius sinapicolor*			
455.		*Cortinarius symeae*			
456.	25592	*Corvus coronoides (Australian Raven)*			
457.	17104	*Corymbia calophylla (Marri)*			
458.	1285	*Corynotheca micrantha (Sand Lily)*			
459.	6352	*Cosmelia rubra (Spindle Heath)*			
460.	18319	*Cotoneaster glaucophyllus*	Y		
461.	7943	*Cotula australis (Common Cotula)*			
462.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
463.	7947	*Cotula turbinata (Funnel Weed)*	Y		
464.	24671	*Coturnix pectoralis (Stubble Quail)*			
465.	25701	*Coturnix ypsilophora (Brown Quail)*			
466.	25595	*Cracticus tibicen (Australian Magpie)*			
467.	25596	*Cracticus torquatus (Grey Butcherbird)*			
468.	3137	*Crassula colorata (Dense Stonecrop)*			
469.	15706	*Crassula natans var. minus*	Y		
470.	25398	*Crinia georgiana (Quacking Frog)*			
471.	25399	*Crinia glauerti (Clicking Frog)*			
472.		*Cristiceps australis*			
473.	1514	*Crocosmia x crocosmiiflora*	Y		
474.	4451	*Crowea angustifolia (Crowea)*			
475.	17729	*Crowea angustifolia var. platyphylla*			
476.	1627	*Cryptostylis ovata (Slipper Orchid)*			
477.	25031	*Ctenotus catenifer*			
478.	25049	*Ctenotus labillardieri*			
479.		*Culicidae sp.*			
480.	768	*Cyathochaeta avenacea*			
481.	17618	*Cyathochaeta equitans*			
482.		*Cyclosa trilobata*			
483.	24322	*Cygnus atratus (Black Swan)*			
484.	283	*Cynodon dactylon (Couch)*	Y		
485.	285	*Cynosurus echinatus (Rough Dogstail)*	Y		
486.	783	*Cyperus congestus (Dense Flat-sedge)*	Y		
487.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
488.	30902	*Dacelo novaeguineae subsp. novaeguineae (Laughing Kookaburra)*	Y		
489.	287	*Dactylis glomerata (Cocksfoot)*	Y		
490.	7444	*Dampiera hederacea (Karri Dampiera)*			
491.	7452	*Dampiera leptoclada (Slender-shooted Dampiera)*			
492.	7454	*Dampiera linearis (Common Dampiera)*			
493.	7462	*Dampiera pedunculata*			
494.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
495.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
496.	5519	*Darwinia oederoides*			
497.	5533	*Darwinia vestita (Pom-pom Darwinia)*			
498.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
499.	10871	*Daucus carota (Wild Carrot)*	Y		
500.	6218	*Daucus glochidiatus (Australian Carrot)*			
501.	3791	*Daviesia alternifolia*			
502.	3811	*Daviesia flexuosa*			
503.	3817	*Daviesia inflata*			
504.		*Dermocybe austroveneta*			
505.		*Dermocybe clelandii*			
506.	38783	*Dermocybe splendida*			
507.	38784	*Descomyces albus*			
508.	17691	*Desmocladus fasciculatus*			
509.	16595	*Desmocladus flexuosus*			
510.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
511.		*Diaea socialis*			
512.	306	*Dichelachne crinita (Longhair Plumegrass)*			
513.	32344	*Dicranoloma diaphanoneuron*			
514.	32346	*Didymodon torquatus*			
515.	40865	*Dielsiodoxa lycopodioides*			

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516.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
517.	3011	*Diplotaxis muralis (Wall Rocket)*	Y		
518.	3867	*Dipogon lignosus (Dolichos Pea)*	Y		
519.	19649	*Disa bracteata*	Y		
520.	1632	*Diuris emarginata (Tall Donkey Orchid)*			
521.	1633	*Diuris laevis (Nannygoat Orchid)*			
522.	1636	*Diuris pauciflora*			
523.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
524.		*Dolichopodidae sp.*			
525.	1640	*Drakaea glyptodon (King-in-his-carriage)*			
526.	1642	*Drakaea thynniphila*			
527.	24470	*Dromaius novaehollandiae (Emu)*			
528.	13218	*Drosera erythrogyne*			
529.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
530.	3110	*Drosera microphylla (Golden Rainbow)*			
531.	3111	*Drosera modesta (Modest Rainbow)*			
532.	3112	*Drosera myriantha (Star Rainbow)*			
533.	3118	*Drosera pallida (Pale Rainbow)*			
534.	3122	*Drosera platypoda (Fan-leaved Sundew)*			
535.	3124	*Drosera pulchella (Pretty Sundew)*			
536.	3131	*Drosera stolonifera (Leafy Sundew)*			
537.	8914	*Drosera sulphurea (Sulphur-flowered Sundew)*			
538.	33480	*Dysphania pumilio (Clammy Goosefoot)*			
539.		*Dytiscidae sp.*			
540.	32351	*Eccremidium pulchellum*			
541.	11105	*Echinochloa crus-galli*	Y		
542.	25251	*Echiopsis curta (Bardick)*			
543.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
544.		*Ecnomidae sp.*			
545.	25096	*Egernia kingii (King's Skink)*			
546.	25100	*Egernia napoleonis*			
547.		*Egretta garzetta*			
548.		*Egretta novaehollandiae*			
549.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
550.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
551.		*Elanus axillaris*			
552.	39900	*Elaphomyces chlorocarpus*			
553.	25250	*Elapognathus coronatus (Crowned Snake)*			
554.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
555.		*Emertonella maga*			
556.		*Empididae sp.*			
557.	1067	*Empodisma gracillimum*			
558.		*Engraulis australis*			
559.		*Enoplosus armatus*			
560.		*Entoloma kermandii*			
561.		*Entoloma maldea*			
562.	32353	*Entosthodon apophysatus*			
563.	32354	*Entosthodon productus*			
564.		*Eolophus roseicapillus*			
565.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
566.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
567.	11992	*Epilobium billardiereanum subsp. intermedium*			
568.	24567	*Epthianura albifrons (White-fronted Chat)*			
569.	373	*Eragrostis brownii (Brown's Lovegrass)*			
570.	376	*Eragrostis curvula (African Lovegrass)*	Y		
571.	43301	*Erica lusitanica*	Y		Y
572.	15412	*Eriochilus dilatatus subsp. multiflorus*			
573.	15414	*Eriochilus helonomos*			
574.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
575.	5625	*Eucalyptus diversicolor (Karri)*			
576.	5667	*Eucalyptus guilfoylei (Yellow Tingle, Dingul Dingul)*			
577.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
578.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
579.	5709	*Eucalyptus megacarpa (Bullich, Pulidj)*			
580.	5739	*Eucalyptus patens (Swan River Blackbutt, Dwuda)*			
581.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
582.	5776	*Eucalyptus staeri (Albany Blackbutt)*			
583.	3872	*Euchilopsis linearis (Swamp Pea)*			
584.	25744	*Eudyptes chrysocome (Rockhopper Penguin)*			
585.	24818	*Eudyptula minor subsp. novaehollandiae (Little Penguin)*			

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586.	20214	*Eutaxia myrtifolia*			
587.	3879	*Eutaxia parvifolia*			
588.	834	*Evandra aristata*			
589.	10907	*Exocarpos odoratus (Scented Ballart)*			
590.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
591.	25621	*Falco berigora (Brown Falcon)*			
592.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
593.	25623	*Falco longipennis (Australian Hobby)*			
594.	25677	*Falcunculus frontatus (Crested Shrike-tit)*			
595.	24616	*Falcunculus frontatus subsp. leucogaster (Western Shrike-tit, Crested Shrike-tit)*			
596.	430	*Festuca arundinacea (Tall Fescue)*	Y		
597.	20216	*Ficinia nodosa (Knotted Club Rush)*			
598.	32363	*Fissidens curvatus*			
599.	32365	*Fissidens leptocladus*			
600.	32369	*Fissidens tenellus*			
601.	27743	*Flavoparmelia diffractaica*			
602.	27745	*Flavoparmelia haysomii*			
603.	27748	*Flavoparmelia rutidota*			
604.	6221	*Foeniculum vulgare (Fennel)*	Y		
605.	1944	*Franklandia fucifolia (Lanoline Bush)*			
606.	18300	*Fuchsia magellanica*	Y		Y
607.	25727	*Fulica atra (Eurasian Coot)*			
608.	39033	*Fuligo septica*			
609.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
610.	31532	*Fumaria muralis subsp. muralis*	Y		
611.	34028	*Galaxias occidentalis (Western Minnow)*			
612.	7323	*Galium murale (Small Goosegrass)*	Y		
613.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
614.	3891	*Gastrolobium bilobum (Heart Leaf Poison)*			
615.	3893	*Gastrolobium brownii*			
616.	20490	*Gastrolobium coriaceum*			
617.	19190	*Gastrolobium cuneatum*			
618.	20511	*Gastrolobium minus*			
619.	20500	*Gastrolobium sericeum*			
620.		*Geastrum sp.*			
621.	32375	*Gemmabryum chrysoneuron*			
622.	32376	*Gemmabryum dichotomum*			
623.	32380	*Gemmabryum pachythecum*			
624.	25404	*Geocrinia leai (Ticking Frog)*			
625.		*Geoglossum glutinosum*			
626.	25530	*Gerygone fusca (Western Gerygone)*			
627.	24271	*Gerygone fusca subsp. fusca (Western Gerygone)*			
628.		*Girella zebra*			
629.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
630.		*Gnathanodon speciosus*			
631.	3948	*Gompholobium capitatum*			
632.	10909	*Gompholobium confertum*			
633.	3950	*Gompholobium knightianum*			
634.	3954	*Gompholobium polymorphum*			
635.	11083	*Gompholobium scabrum*			
636.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
637.	3958	*Gompholobium venustum (Handsome Wedge-pea)*			
638.	11115	*Gompholobium villosum*			
639.	16746	*Gonocarpus benthamii subsp. benthamii*			
640.		*Gonorynchus greyi*			
641.	7505	*Goodenia eatoniana*			
642.	7523	*Goodenia leptoclada (Thin-stemmed Goodenia)*			
643.		*Gordiidae sp.*			
644.	24443	*Grallina cyanoleuca (Magpie-lark)*			
645.	1977	*Grevillea cirsiifolia (Varied-leaf Grevillea)*			
646.	2052	*Grevillea occidentalis*			
647.	15991	*Grevillea pulchella subsp. pulchella*			
648.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
649.	2112	*Grevillea trifida*			
650.		*Gripopterygidae sp.*			
651.		*Gymnopilus dilepis*			Y
652.		*Gymnopilus purpuratus*			
653.	908	*Gymnoschoenus anceps*			
654.	32390	*Gymnostomum calcareum*			
655.		*Gyrinidae sp.*			

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656.	2787	*Gyrostemon sheathii*			
657.	25627	*Haematopus fuliginosus (Sooty Oystercatcher)*			
658.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
659.	1468	*Haemodorum laxum*			
660.	1474	*Haemodorum sparsiflorum*			
661.	1475	*Haemodorum spicatum (Mardja)*			
662.	2128	*Hakea amplexicaulis (Prickly Hakea)*			
663.	2137	*Hakea ceratophylla (Horned Leaf Hakea)*			
664.	2150	*Hakea cucullata (Hood Leaved Hakea)*			
665.	2159	*Hakea falcata*			
666.	2162	*Hakea florida*			
667.	2174	*Hakea linearis*			
668.	2191	*Hakea oleifolia (Dungyn)*			
669.	2197	*Hakea prostrata (Harsh Hakea)*			
670.	2203	*Hakea ruscifolia (Candle Hakea)*			
671.	41267	*Halegrapha mucronata*			
672.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
673.	24295	*Haliastur sphenurus (Whistling Kite)*			
674.	6183	*Haloragodendron racemosum (Shrubby Raspwort)*			
675.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
676.	32392	*Hedwigidium integrifolium*			
677.	25410	*Heleioporus eyrei (Moaning Frog)*			
678.	25412	*Heleioporus psammophilus (Sand Frog)*			
679.	439	*Hemarthria uncinata (Matgrass)*			
680.	11451	*Hemarthria uncinata var. uncinata*			
681.		*Hemicorduliidae sp.*			
682.	30919	*Hemiergis gracilipes (skink)*			
683.	25117	*Hemiergis peronii subsp. peronii*			
684.	6855	*Hemigenia humilis*			
685.	6856	*Hemigenia incana (Silky Hemigenia)*			
686.	6865	*Hemigenia podalyrina*			
687.		*Hemiramphus sp.*			
688.		*Henicops dentatus*			
689.		*Heteroclinus eckloniae*			
690.	27777	*Heterodermia obscurata*			
691.	5109	*Hibbertia amplexicaulis*			
692.	5114	*Hibbertia commutata*			
693.	5117	*Hibbertia cuneiformis (Cutleaf Hibbertia)*			
694.	5119	*Hibbertia depressa*			
695.	5126	*Hibbertia furfuracea*			
696.	19777	*Hibbertia glomerata subsp. glomerata*			
697.	5132	*Hibbertia grossulariifolia*			
698.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
699.	19687	*Hibbertia notibractea*			
700.	5154	*Hibbertia perfoliata*			
701.	5155	*Hibbertia pilosa (Hairy Guinea Flower)*			
702.	5159	*Hibbertia pulchra*			
703.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
704.	5169	*Hibbertia serrata (Serrate Leaved Guinea Flower)*			
705.	47965	*Hieraaetus morphnoides (Little Eagle)*			
706.	25734	*Himantopus himantopus (Black-winged Stilt)*			
707.	24491	*Hirundo neoxena (Welcome Swallow)*			
708.	13758	*Histiopteris incisa*			
709.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
710.	5816	*Homalospermum firmum*			
711.	449	*Hordeum leporinum (Barley Grass)*	Y		
712.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
713.	3965	*Hovea elliptica (Tree Hovea)*			
714.		*Hydnangium carneum*			
715.		*Hydnoplicata convoluta*			
716.	38794	*Hydnum repandum*			
717.		*Hydraenidae sp.*			
718.		*Hydrobiosidae sp.*			
719.	6241	*Hydrocotyle tetragonocarpa*			
720.		*Hydrometridae sp.*			
721.		*Hydrophilidae sp.*			
722.	43384	*Hydrophis platurus (Yellow-bellied Seasnake)*			
723.		*Hydropsychidae sp.*			
724.		*Hydroptilidae sp.*			
725.	38795	*Hygrocybe conica*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
726.		*Hygrocybe polychroma*			
727.		*Hygrocybe viscidibrunnea*			
728.		*Hylaeus (Macrohylaeus) alcyoneus*			Y
729.		*Hymenosomatidae sp.*			
730.	38796	*Hypholoma australe*			
731.	32394	*Hypnum cupressiforme*			
732.	5818	*Hypocalymma cordifolium*			
733.	43120	*Hypocalymma minus*			
734.	13106	*Hypocalymma scariosum*			
735.	5827	*Hypocalymma strictum*			
736.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
737.	27785	*Hypogymnia pulchrilobata*			
738.	27787	*Hypogymnia subphysodes*			
739.	28219	*Hypogymnia subphysodes var. subphysodes*			
740.	1070	*Hypolaena exsulca*			
741.	19918	*Hypolaena grandiuscula*			
742.	17841	*Hypolaena pubescens*			
743.		*Hypomyces chrysospermus*			
744.		*Hyporhamphus melanochir*			
745.		*Ichthyscopus barbatus*			
746.	44926	*Ileodictyon gracile*			
747.	48512	*Inocybe dewrangia*			
748.	48514	*Inocybe eriocaulis*			
749.	48687	*Inocybe fulvotomentosa*			
750.	48523	*Inocybe geniculata*			
751.	48528	*Inocybe ionocaulis*			
752.	48538	*Inocybe olivaceohinnulea*			Y
753.	48553	*Inocybe trachysperma*			Y
754.	38799	*Inocybe violaceocaulis*			
755.	6630	*Ipomoea indica (Morning Glory)*	Y		
756.	11	*Isoetes drummondii (Quillwort)*			
757.	20199	*Isolepis cernua var. cernua*			
758.	20200	*Isolepis cernua var. setiformis*			
759.	911	*Isolepis congrua*			
760.	912	*Isolepis cyperoides*			
761.	916	*Isolepis inundata (Swamp Club Rush)*			
762.	917	*Isolepis marginata (Coarse Club-rush)*			
763.	10831	*Isolepis prolifera (Budding Club-rush)*	Y		
764.		*Isopeda leishmanni*			
765.	2222	*Isopogon attenuatus*			
766.	2226	*Isopogon cuneatus (Coneflower)*			
767.	1532	*Ixia maculata (Yellow Ixia)*	Y		
768.	8092	*Ixiolaena viscosa (Sticky Ixiolaena)*			
769.		*Ixodes australiensis*			
770.	45299	*Jackelixia elixii*			
771.	45301	*Jackelixia ligulata*			
772.	4017	*Jacksonia horrida*			
773.	4028	*Jacksonia spinosa*			
774.	1297	*Johnsonia lupulina (Hooded Lily)*			
775.	1299	*Johnsonia teretifolia (Hooded Lily)*			
776.	1177	*Juncus articulatus (Jointed Rush)*	Y		
777.	1178	*Juncus bufonius (Toad Rush)*	Y		
778.	1179	*Juncus caespiticius (Grassy Rush)*			
779.	1180	*Juncus capitatus (Capitate Rush)*	Y		
780.	1184	*Juncus holoschoenus (Jointleaf Rush)*			
781.	11922	*Juncus kraussii subsp. australiensis*			
782.	1186	*Juncus microcephalus*	Y		
783.	1187	*Juncus oxycarpus*	Y		
784.	1188	*Juncus pallidus (Pale Rush)*			
785.	1190	*Juncus planifolius (Broadleaf Rush)*			
786.	1196	*Juncus usitatus (Common Rush)*	Y		
787.	4036	*Kennedia carinata*			
788.	4037	*Kennedia coccinea (Coral Vine)*			
789.	1221	*Kingia australis (Kingia, Pulonok)*			
790.	17506	*Kunzea ericifolia subsp. ericifolia*			
791.	5841	*Kunzea recurva*			
792.	5844	*Kunzea sulphurea*			
793.		*Kurzia compacta*			
794.		*Kurzia hippurioides*			
795.		*Kyphosus gladius MS*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
796.		*Labrid sp.*			Y
797.	38801	*Laccaria proxima*			
798.	48837	*Laccocephalum mylittae*			
799.	38802	*Laccocephalum tumulosum*			
800.	20019	*Lachnagrostis filiformis*			
801.		*Lactarius clarkeae*			
802.	38804	*Lactarius eucalypti*			
803.	2253	*Lambertia uniflora*			
804.		*Lampona brevipes*			
805.		*Lampona cylindrata*			
806.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
807.	25638	*Larus pacificus (Pacific Gull)*			
808.	5033	*Lasiopetalum floribundum (Free Flowering Lasiopetalum)*			
809.	4047	*Lathyrus tingitanus (Tangier Pea)*	Y		
810.	4048	*Latrobea brunonis*			
811.	4049	*Latrobea diosmifolia*			
812.	4050	*Latrobea genistoides*			
813.	1302	*Laxmannia jamesii (James' Paperlily)*			
814.	1304	*Laxmannia minor*			
815.		*Lecanora sp.*			
816.	7572	*Lechenaultia expansa*			
817.	38805	*Lentinellus pulvinulus*			
818.	39038	*Leocarpus fragilis*			
819.	8099	*Leontodon saxatilis (Hairy Hawkbit)*	Y		
820.	3021	*Lepidium bonariense (Peppercress)*	Y		
821.	19989	*Lepidium didymum*	Y		
822.		*Lepidoblennius marmoratus*			
823.	925	*Lepidosperma angustatum*			
824.	932	*Lepidosperma effusum (Spreading Sword-sedge)*			
825.	933	*Lepidosperma gladiatum (Coast Sword-sedge, Kerbin)*			
826.	934	*Lepidosperma gracile (Slender Sword Sedge)*			
827.		*Lepidosperma sp.*			
828.	945	*Lepidosperma squamatum*			
829.	946	*Lepidosperma striatum*			
830.	948	*Lepidosperma tetraquetrum*			
831.	29386	*Lepraria coriensis*			
832.	1078	*Leptocarpus coangustatus*			
833.	46376	*Leptocarpus denmarkicus*			
834.	19833	*Leptocarpus laxus*			
835.	1080	*Leptocarpus scariosus*			
836.	1082	*Leptocarpus tenax (Slender Twine Rush)*			
837.	46379	*Leptocarpus thysananthus*			
838.		*Leptoceridae sp.*			
839.	17703	*Leptomeria ellytes*			
840.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
841.	2355	*Leptomeria squarrulosa*			
842.		*Leptophlebiidae sp.*			
843.	17852	*Leptorhynchos scaber (Lanky Buttons)*			
844.	1087	*Lepyrodia hermaphrodita*			
845.	1089	*Lepyrodia monoica*			
846.	1090	*Lepyrodia muirii*			
847.	25154	*Lerista microtis subsp. microtis*			
848.		*Lethocolea pansa*			
849.	46454	*Leucoagaricus leucothites*			
850.	32400	*Leucobryum subchlorophyllosum*			
851.	38807	*Leucopaxillus lilacinus*			
852.	6360	*Leucopogon australis (Spiked Beard-heath)*			
853.	6387	*Leucopogon distans*			
854.	6396	*Leucopogon glabellus*			
855.	33380	*Leucopogon interstans*			
856.	6417	*Leucopogon obovatus*			
857.	40940	*Leucopogon obovatus subsp. obovatus*			
858.	40941	*Leucopogon obovatus subsp. revolutus*			
859.	35499	*Leucopogon paradoxus*			
860.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
861.	6435	*Leucopogon polystachyus*			
862.	6436	*Leucopogon propinquus*			
863.	6441	*Leucopogon reflexus (Heart-leaf Beard-heath)*			
864.	10755	*Leucopogon rubricaulis*			
865.	19202	*Leucopogon sp. Walpole (R.J. Cranfield 10940)*			

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866.	6454	*Leucopogon verticillatus (Tassel Flower)*			
867.	7676	*Levenhookia pusilla (Midget Stylewort)*			
868.	25005	*Lialis burtonis*			
869.	31280	*Lichenomphalia chromacea*			
870.	25661	*Lichmera indistincta (Brown Honeyeater)*			
871.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
872.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
873.	59	*Lindsaea linearis (Screw Fern)*			
874.	4363	*Linum trigynum (French Flax)*	Y		
875.	41416	*Liopholis pulchra subsp. pulchra (South-western Rock Skink, Spectacled Rock Skink)*			
876.	42413	*Lissolepis luctuosa (Western Swamp Skink)*			
877.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
878.	25388	*Litoria moorei (Motorbike Frog)*			
879.	9289	*Lobelia anceps (Angled Lobelia)*			
880.	7403	*Lobelia heterophylla (Wing-seeded Lobelia)*			
881.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
882.	7408	*Lobelia tenuior (Slender Lobelia)*			
883.	3048	*Lobularia maritima (Sweet Alyssum)*	Y		
884.	6515	*Logania vaginalis (White Spray)*			
885.	475	*Lolium multiflorum (Italian Ryegrass)*	Y		
886.	476	*Lolium perenne (Perennial Ryegrass)*	Y		
887.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
888.	1222	*Lomandra brittanii*			
889.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
890.	1229	*Lomandra integra*			
891.	14542	*Lomandra micrantha subsp. micrantha*			
892.	1234	*Lomandra nigricans*			
893.	1238	*Lomandra pauciflora*			
894.	1243	*Lomandra sericea (Silky Mat Rush)*			
895.	1244	*Lomandra sonderi*			
896.		*Lophoictinia isura*			
897.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
898.	8564	*Lotus subbiflorus*	Y		
899.	4063	*Lotus uliginosus (Greater Lotus)*	Y		
900.	1092	*Loxocarya cinerea*			
901.	39048	*Lycogala epidendrum*			
902.	1097	*Lyginia barbata*			
903.	18049	*Lyginia imberbis*			
904.		*Lymnaeidae sp.*			
905.	1656	*Lyperanthus serratus (Rattle Beak Orchid)*			
906.	6456	*Lysinema ciliatum (Curry Flower)*			
907.	6457	*Lysinema conspicuum*			
908.	34736	*Lysinema pentapetalum*			
909.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
910.		*Macrolepiota clelandii*			
911.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
912.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
913.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
914.	25654	*Malurus splendens (Splendid Fairy-wren)*			
915.	36522	*Malva pseudolavatera*	Y		
916.		*Marasmius elegans*			
917.		*Maratus linnaei*			
918.	17637	*Marianthus candidus (White Marianthus)*			
919.	25822	*Marianthus sylvaticus*			
920.	4072	*Medicago arabica (Spotted Medic)*	Y		
921.	4076	*Medicago lupulina (Black Medic)*	Y		
922.	4079	*Medicago polymorpha (Burr Medic)*	Y		
923.	27850	*Megalaria grossa*			
924.	27851	*Megalospora occidentalis*			
925.	25758	*Megalurus gramineus (Little Grassbird)*			
926.		*Megapodagrionidae sp.*			
927.	40780	*Melaleuca citrina*	Y		
928.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
929.	5902	*Melaleuca densa*			
930.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
931.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
932.	5938	*Melaleuca microphylla*			
933.	5946	*Melaleuca pauciflora*			
934.	5952	*Melaleuca preissiana (Moonah)*			
935.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			

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936.	5968	*Melaleuca spathulata*			
937.	5980	*Melaleuca thymoides*			
938.	5987	*Melaleuca viminea (Mohan)*			
939.		*Melanophyllum haematospermum*			
940.	4085	*Melilotus indicus*	Y		
941.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
942.	27854	*Menegazzia platytrema*			
943.		*Menneus wa*			
944.	6883	*Mentha pulegium (Pennyroyal)*	Y		
945.	953	*Mesomelaena graciliceps*			
946.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
947.	25419	*Metacrinia nichollsi (Forest Toadlet)*			
948.		*Meuschenia galii*			
949.		*Microcarbo melanoleucos*			
950.	24654	*Microeca fascinans subsp. assimilis (Jacky Winter)*			
951.	485	*Microlaena stipoides (Weeping Grass)*			
952.	1657	*Microtis alba (White Mignonette Orchid)*			
953.	34158	*Microtis alboviridis*			
954.	1658	*Microtis atrata (Swamp Mignonette Orchid)*			
955.	10954	*Microtis media (Tall Mignonette Orchid)*			
956.	12761	*Microtis media subsp. densiflora*			
957.	15419	*Microtis media subsp. media*			
958.	4096	*Mirbelia ovata*			
959.		*Missulena occatoria*			
960.		*Mituliodon tarantulinus*			
961.	4963	*Modiola caroliniana*	Y		
962.	48008	*Morus serrator (Australasian Gannet)*			
963.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
964.		*Mugil cephalus*			
965.	24223	*Mus musculus (House Mouse)*	Y		
966.		*Mycena pura*			
967.	38813	*Mycena subgalericulata*			
968.	7292	*Myoporum oppositifolium (Twin-leaf Myoporum)*			
969.	7295	*Myoporum tetrandrum (Boobialla)*			
970.		*Nannoperca vittata*			
971.		*Nematoda sp.*			
972.		*Neoniphargidae sp.*			
973.		*Neopataecus waterhousii*			
974.	24738	*Neophema elegans (Elegant Parrot)*			
975.	24739	*Neophema petrophila (Rock Parrot)*			
976.	27880	*Normandina pulchella*			
977.	25252	*Notechis scutatus (Tiger Snake)*			
978.	38815	*Nothocastoreum cretaceum*			
979.		*Notolabrus parilus*			
980.		*Notonectidae sp.*			
981.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
982.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
983.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
984.	27882	*Ochrolechia parella*			Y
985.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
986.		*Oecobius navus*			
987.	6139	*Oenothera glazioviana (Evening Primrose)*	Y		
988.	2365	*Olax benthamiana*			
989.	2366	*Olax phyllanthi*			
990.	8127	*Olearia axillaris (Coastal Daisybush)*			
991.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
992.		*Oligochaeta sp.*			
993.	38816	*Omphalotus nidiformis*			
994.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
995.	18255	*Opercularia vaginata (Dog Weed)*			
996.	7354	*Opercularia volubilis (Twining Stinkweed)*			
997.		*Ophisurus serpens*			
998.		*Oratemnus curtus*			
999.	46255	*Orianthera campanulata*			
1000.	46315	*Orianthera serpyllifolia subsp. serpyllifolia*			
1001.	36181	*Ornduffia parnassifolia*			
1002.	4113	*Ornithopus compressus (Yellow Serradella)*	Y		
1003.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
1004.		*Orthocladiinae sp.*			
1005.	32406	*Orthodontium lineare*			

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1006.	1540	*Orthrosanthus polystachyus (Many Spike Orthrosanthus)*			
1007.	4349	*Oxalis corniculata (Yellow Wood Sorrel)*	Y		
1008.	18331	*Oxalis debilis var. corymbosa (Pink Shamrock)*	Y		
1009.	30375	*Oxalis exilis*			
1010.	4354	*Oxalis incarnata*	Y		
1011.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
1012.	25707	*Pachyptila salvini (Salvin's Prion)*			
1013.		*Pagrus auratus*			
1014.		*Palaemonidae sp.*			
1015.	38817	*Panaeolus papilionaceus*			
1016.	27888	*Pannaria elixii*			
1017.	516	*Parapholis incurva (Coast Barbgrass)*	Y		
1018.		*Paraplagusia sp.*			
1019.		*Paraplesiops meleagris*			
1020.	17114	*Paraserianthes lophantha subsp. lophantha*			
1021.		*Parastacidae sp.*			
1022.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
1023.	24625	*Pardalotus punctatus subsp. punctatus (Spotted Pardalote)*			
1024.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
1025.	25682	*Pardalotus striatus (Striated Pardalote)*			
1026.	1762	*Parietaria debilis (Pellitory)*			
1027.	27923	*Parmotrema cooperi*			
1028.	27924	*Parmotrema praesorediosum*			
1029.	30458	*Parmotrema reticulatum*			
1030.	527	*Paspalum dilatatum*	Y		
1031.	533	*Paspalum vaginatum (Salt Water Couch)*			
1032.	5225	*Passiflora filamentosa*	Y		
1033.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
1034.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
1035.	14432	*Patersonia umbrosa var. umbrosa*			
1036.		*Paxillus involutus*			
1037.	4342	*Pelargonium australe (Wild Geranium)*			
1038.	4346	*Pelargonium littorale*			
1039.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
1040.	6246	*Pentapeltis silvatica (Southern Pentapeltis)*			
1041.	11109	*Pericalymma crassipes*			
1042.	15501	*Pericalymma spongiocaule*			
1043.	11020	*Persicaria hydropiper*			
1044.	2267	*Persoonia longifolia (Snottygobble)*			
1045.		*Perthiidae sp.*			
1046.	48060	*Petrochelidon ariel (Fairy Martin)*			
1047.	48061	*Petrochelidon nigricans (Tree Martin)*			
1048.	48066	*Petroica boodang (Scarlet Robin)*			
1049.	24659	*Petroica goodenovii (Red-capped Robin)*			
1050.	2282	*Petrophile acicularis*			
1051.	2293	*Petrophile diversifolia*			
1052.	2306	*Petrophile rigida*			
1053.		*Peziza sp.*			
1054.	27962	*Phaeophyscia endococcinodes*			
1055.	25697	*Phalacrocorax carbo (Great Cormorant)*			
1056.	24664	*Phalacrocorax carbo subsp. novaehollandiae (Great Cormorant)*			
1057.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
1058.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
1059.	25699	*Phalacrocorax varius (Pied Cormorant)*			
1060.	548	*Phalaris aquatica (Phalaris)*	Y		
1061.	24409	*Phaps chalcoptera (Common Bronzewing)*			
1062.	25587	*Phaps elegans (Brush Bronzewing)*			
1063.		*Phellinus setulosus*			
1064.	32409	*Philonotis australiensis*			
1065.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
1066.	1478	*Phlebocarya ciliata*			
1067.		*Pholcus phalangioides*			
1068.		*Pholiota highlandensis*			
1069.		*Phryganoporus candidus*			
1070.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
1071.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
1072.	4140	*Phyllota barbata*			
1073.	39060	*Physarum album*			
1074.	39063	*Physarum cinereum*			
1075.	27972	*Physcia jackii*			

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1076.	27974	*Physcia poncinsii*			
1077.		*Physidae sp.*			
1078.	2793	*Phytolacca octandra (Red Ink Plant)*	Y		
1079.		*Phytophthora cinnamomi*			
1080.	5239	*Pimelea clavata*			
1081.	5243	*Pimelea ferruginea*			
1082.	5249	*Pimelea hispida (Bristly Pimelea)*			
1083.	11402	*Pimelea imbricata var. piligera*			
1084.	5252	*Pimelea lanata*			
1085.	5255	*Pimelea longiflora*			
1086.	5261	*Pimelea rosea (Rose Banjine)*			
1087.	18117	*Pimelea rosea subsp. rosea*			
1088.	5264	*Pimelea spectabilis (Bunjong)*			
1089.	5269	*Pimelea sylvestris*			
1090.	5270	*Pimelea tinctoria*			
1091.	48973	*Pisolithus albus*			
1092.	48974	*Pisolithus marmoratus*			
1093.	48975	*Pisolithus microcarpus*			
1094.		*Pisolithus sp.*			
1095.	42281	*Pithocarpa cordata*			
1096.	42260	*Pithocarpa ramosa*			
1097.	16322	*Pittosporum undulatum*	Y		
1098.		*Planorbidae sp.*			
1099.	7303	*Plantago lanceolata (Ribwort Plantain)*	Y		
1100.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
1101.	24842	*Platalea regia (Royal Spoonbill)*			
1102.		*Platycephalus speculator*			
1103.	25720	*Platycercus icterotis (Western Rosella)*			
1104.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
1105.	24747	*Platycercus spurius (Red-capped Parrot)*			
1106.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
1107.	6249	*Platysace compressa (Tapeworm Plant)*			
1108.	6250	*Platysace deflexa*			
1109.	6253	*Platysace filiformis*			
1110.	6258	*Platysace pendula*			
1111.	27151	*Platythalia angustifolia*			
1112.	4524	*Platytheca galioides*			
1113.	4525	*Platytheca juniperina*			
1114.	32478	*Pleuridium nervosum var. nervosum*			
1115.		*Pluteus atromarginatus*			
1116.	573	*Poa drummondiana (Knotted Poa)*			
1117.	577	*Poa poiformis (Coastal Poa)*			
1118.	578	*Poa porphyroclados*			
1119.	25703	*Podargus strigoides (Tawny Frogmouth)*			
1120.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
1121.		*Podargus strigoides subsp. strigoides*			
1122.	25704	*Podiceps cristatus (Great Crested Grebe)*			
1123.	24680	*Podiceps cristatus subsp. australis (Great Crested Grebe)*			
1124.	86	*Podocarpus drouynianus (Wild Plum, Kula)*			
1125.	8175	*Podolepis gracilis (Slender Podolepis)*			
1126.	38826	*Podoserpula pusio*			
1127.	8182	*Podotheca angustifolia (Sticky Longheads)*			
1128.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
1129.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
1130.	2905	*Polycarpon tetraphyllum (Fourleaf Allseed)*	Y		
1131.	4578	*Polygala virgata*	Y		
1132.	2419	*Polygonum aviculare (Wireweed)*	Y		
1133.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
1134.	25722	*Polytelis anthopeplus (Regent Parrot)*			
1135.		*Pomatomus saltatrix*			
1136.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
1137.	34013	*Pomatostomus superciliosus subsp. ashbyi (White-browed Babbler (western wheatbelt))*			
1138.	4688	*Poranthera drummondii*			
1139.	4690	*Poranthera huegelii*			
1140.	4691	*Poranthera microphylla (Small Poranthera)*			
1141.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
1142.	24771	*Porzana tabuensis (Spotless Crake)*			
1143.	15424	*Praecoxanthus aphyllus*			
1144.	11066	*Prasophyllum cucullatum (Hooded Leek Orchid)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1145.	1670	*Prasophyllum drummondii (Swamp Leek Orchid)*			
1146.	1671	*Prasophyllum elatum (Tall Leek Orchid)*			
1147.	17650	*Prasophyllum odoratissimum*			
1148.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
1149.	1681	*Prasophyllum regium (King Leek Orchid)*			
1150.	44084	*Prasophyllum sp. early (G. Brockman GBB 1626)*			
1151.	1683	*Prasophyllum triangulare (Dark Leek Orchid)*			
1152.		*Protogarypinus giganteus*			
1153.	6927	*Prunella vulgaris (Self Heal)*	Y		
1154.		*Psathyrella candolleana*			
1155.		*Pseudocaranx dentex*			
1156.		*Pseudocaranx georgianus*			
1157.	36219	*Pseudocrossidium hornschuchianum*			
1158.	27997	*Pseudocyphellaria neglecta*			
1159.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
1160.		*Pseudogobius olorum*			
1161.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
1162.		*Pseudophycis breviuscula*			
1163.	4155	*Psoralea pinnata (African Scurfpea)*	Y		
1164.	24703	*Pterodroma lessonii (White-headed Petrel)*			
1165.	18655	*Pterostylis sp. crinkled leaf (G.J. Keighery 13426)*			
1166.	1698	*Pterostylis vittata (Banded Greenhood)*			
1167.	32417	*Ptychostomum angustifolium*			
1168.	4165	*Pultenaea barbata*			
1169.	4181	*Pultenaea reticulata*			
1170.	4186	*Pultenaea tenuifolia*			
1171.		*Purpureicephalus spurius*			
1172.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
1173.	8195	*Quinetia urvillei*			
1174.	32480	*Racopilum cuspidigerum var. convolutaceum*			
1175.		*Radula buccinifera*			
1176.	28026	*Ramalina canariensis*			
1177.	28030	*Ramalina glaucescens*			
1178.		*Ramaria australiana*			
1179.		*Ramaria versatilis*			
1180.	28037	*Ramboldia stuartii*			
1181.	48904	*Ranunculus repens*	Y		Y
1182.	24243	*Rattus fuscipes (Western Bush Rat)*			
1183.	24245	*Rattus rattus (Black Rat)*	Y		
1184.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
1185.	32421	*Rhacocarpus purpurascens*			
1186.	11341	*Rhagodia baccata subsp. baccata*			
1187.	32422	*Rhaphidorrhynchium amoenum*			
1188.	30818	*Rhinoplocephalus bicolor (Square-nosed Snake)*			
1189.	48096	*Rhipidura albiscapa (Grey Fantail)*			
1190.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
1191.		*Riccardia aequicellularis*			
1192.		*Riccardia bipinnatifida*			
1193.		*Riccardia graeffei*			
1194.		*Riccia bifurca*			
1195.		*Richardsonianidae sp.*			
1196.	4695	*Ricinocarpos glaucus*			
1197.	17020	*Robinia pseudoacacia*	Y		
1198.	16243	*Rosa canina*	Y		
1199.	32424	*Rosulabryum albolimbatum*			
1200.	44608	*Rosulabryum billarderii*			
1201.	32429	*Rosulabryum torquescens*			
1202.	20506	*Rubus anglocandicans*	Y		
1203.	2429	*Rumex acetosella (Sorrel)*	Y		
1204.	2432	*Rumex conglomeratus (Clustered Dock)*	Y		
1205.	2433	*Rumex crispus (Curled Dock)*	Y		
1206.	2437	*Rumex frutescens*	Y		
1207.	12017	*Rumex pulcher subsp. pulcher (Fiddle Dock)*	Y		
1208.	2447	*Rumex x pseudopulcher*	Y		
1209.		*Russula adusta*			
1210.		*Russula albonigra*			
1211.	48909	*Russula clelandii*			
1212.		*Russula cyanoxantha*			
1213.	38838	*Russula persanguinea*			
1214.	48861	*Russula pumicoidea*			

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1215.	48956	*Russula theodoroui*			Y
1216.	48740	*Russula wirrabarensis*			
1217.	40431	*Rytidosperma acerosum*			
1218.	40425	*Rytidosperma caespitosum*			
1219.	40430	*Rytidosperma pilosum*			
1220.	40428	*Rytidosperma racemosum*			Y
1221.	40427	*Rytidosperma setaceum*			
1222.	2906	*Sagina apetala (Annual Pearlwort)*	Y		
1223.	79	*Salvinia molesta (Salvinia)*	Y		
1224.		*Samichus decoratus*			
1225.	6483	*Samolus junceus*			
1226.	6484	*Samolus repens (Creeping Brookweed)*			
1227.	3192	*Sanguisorba minor (Sheep's Burnet)*	Y		
1228.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
1229.	7614	*Scaevola globulifera*			
1230.	7624	*Scaevola microphylla (Small-leaved Scaevola)*			
1231.	7626	*Scaevola nitida (Shining Fanflower)*			
1232.	7634	*Scaevola phlebopetala (Velvet Fanflower)*			
1233.	7646	*Scaevola striata (Royal Robe)*			
1234.	13175	*Scaevola striata var. striata*			
1235.	24	*Schizaea fistulosa (Narrow Comb Fern)*			
1236.	6263	*Schoenolaena juncea*			
1237.	978	*Schoenus brevisetis*			
1238.	983	*Schoenus cruentus*			
1239.	986	*Schoenus efoliatus*			
1240.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
1241.	8312	*Schoenus maschalinus*			
1242.	1001	*Schoenus multiglumis*			
1243.	1004	*Schoenus nitens (Shiny Bog-rush)*			
1244.	1006	*Schoenus odontocarpus*			
1245.	1017	*Schoenus subbulbosus*			
1246.	1018	*Schoenus subfascicularis*			
1247.	1021	*Schoenus sublaxus*			
1248.		*Scirtidae sp.*			
1249.	32433	*Sematophyllum homomallum*			
1250.	32483	*Sematophyllum subhumile var. contiguum*			
1251.	8208	*Senecio hispidulus (Hispid Fireweed)*			
1252.	20663	*Senecio multicaulis subsp. multicaulis*			
1253.	25884	*Senecio pinnatifolius var. latilobus*			
1254.	8218	*Senecio ramosissimus (Auricled Groundsel)*			
1255.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
1256.	24279	*Sericornis frontalis subsp. maculatus (White-browed Scrubwren)*			
1257.		*Servaea incana*			
1258.		*Servaea melaina*			
1259.	19453	*Setaria parviflora*	Y		
1260.	11803	*Silene gallica var. quinquevulnera*	Y		
1261.		*Sillaginodes punctata*			
1262.		*Sillago bassensis*			
1263.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
1264.		*Simuliidae sp.*			
1265.		*Siphonotus flavomarginatus*			
1266.	30948	*Smicrornis brevirostris (Weebill)*			
1267.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
1268.	6988	*Solanum americanum (Glossy Nightshade)*	Y		
1269.	7017	*Solanum laciniatum (Kangaroo Apple)*	Y		
1270.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
1271.		*Sphaeriidae sp.*			
1272.	17551	*Sphaerolobium drummondii*			
1273.	4204	*Sphaerolobium grandiflorum*			
1274.	20302	*Sphaerolobium hygrophilum*			
1275.	4207	*Sphaerolobium medium*			
1276.	17547	*Sphaerolobium pubescens*			
1277.	17548	*Sphaerolobium rostratum*			
1278.		*Sphaeromatidae sp.*			
1279.	31931	*Sphenotoma capitata*			
1280.	31952	*Sphenotoma gracilis (Swamp Paper-heath)*			
1281.	31951	*Sphenotoma parviflora*			
1282.	31932	*Sphenotoma squarrosa*			
1283.		*Spinicrus minimus*			
1284.	14917	*Sporadanthus rivularis*			

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1285.	14915	*Sporadanthus strictus*			
1286.	8710	*Sporobolus africanus (Parramatta Grass)*	Y		
1287.	635	*Sporobolus virginicus (Marine Couch)*			
1288.	27310	*Spyridia filamentosa*			
1289.	4828	*Spyridium globulosum (Basket Bush)*			
1290.	6930	*Stachys arvensis (Staggerweed)*	Y		
1291.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
1292.		*Staphylinidae sp.*			
1293.	636	*Stenotaphrum secundatum (Buffalo Grass)*	Y		
1294.	38840	*Stereum hirsutum*			
1295.	48594	*Sternula nereis (Fairy Tern)*			
1296.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
1297.	24554	*Stipiturus malachurus subsp. westernensis (Southern Emu-wren)*			
1298.		*Storosa tetrica*			
1299.	2320	*Strangea stenocarpoides*			
1300.	25597	*Strepera versicolor (Grey Currawong)*			
1301.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
1302.	39881	*Stylidium acuminatum subsp. meridionale*			
1303.	7678	*Stylidium adnatum (Common Beaked Triggerplant)*			
1304.	7684	*Stylidium amoenum (Lovely Triggerplant)*			
1305.	7695	*Stylidium caespitosum (Fly-away Triggerplant)*			
1306.	7696	*Stylidium calcaratum (Book Triggerplant)*			
1307.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
1308.	40944	*Stylidium decipiens*			
1309.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
1310.	7718	*Stylidium diversifolium (Touch-me-not)*			
1311.	7734	*Stylidium guttatum (Dotted Triggerplant)*			
1312.	7745	*Stylidium junceum (Reed Triggerplant)*			
1313.	7746	*Stylidium laciniatum (Tattered Triggerplant)*			
1314.	7757	*Stylidium luteum (Yellow Triggerplant)*			
1315.	25851	*Stylidium nymphaeum*			
1316.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
1317.	46517	*Stylidium planirosula*			
1318.	7778	*Stylidium pritzelianum (Royal Triggerplant)*			
1319.	7782	*Stylidium pulchellum (Thumbelina Triggerplant)*			
1320.	7785	*Stylidium repens (Matted Triggerplant)*			
1321.	7787	*Stylidium rhynchocarpum (Black-beaked Triggerplant)*			
1322.	7796	*Stylidium scandens (Climbing Triggerplant)*			
1323.	7799	*Stylidium spathulatum (Creamy Triggerplant)*			
1324.	7802	*Stylidium squamosotuberosum (Fleshy-rhizomed Trigger Plant)*			
1325.		*Styloniscidae sp.*			
1326.	1260	*Stypandra glauca (Blind Grass)*			
1327.		*Symphyogyna podophylla*			
1328.	2322	*Synaphea favosa*			
1329.	16863	*Synaphea petiolaris subsp. triloba*			
1330.	2326	*Synaphea polymorpha (Albany Synaphea, Pinda)*			
1331.	2328	*Synaphea reticulata*			
1332.		*Synothele rastelloides*			
1333.		*Synthemistidae sp.*			
1334.	32439	*Syntrichia papillosa*			
1335.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1336.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
1337.		*Talitridae sp.*			
1338.		*Tanypodinae sp.*			
1339.	15827	*Taraxis grossa*			
1340.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
1341.	24082	*Tasmacetus shepherdi (Shepherd's Beaked Whale)*			
1342.	20100	*Taxandria angustifolia*			
1343.	20114	*Taxandria fragrans*			
1344.	20115	*Taxandria juniperina*			
1345.	20135	*Taxandria linearifolia*			
1346.	20134	*Taxandria marginata*			
1347.	20133	*Taxandria parviceps*			
1348.	32440	*Tayloria octoblepharum*			
1349.		*Telephlebiidae sp.*			
1350.	28065	*Teloschistes chrysophthalmus*			
1351.		*Temnocephalidea sp.*			
1352.		*Temnosewellia chaeropsis*			Y
1353.	4256	*Templetonia retusa (Cockies Tongues)*			
1354.	35477	*Tephromela alectoronica*			

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1355.	28068	*Tephromela atra*			
1356.		*Tetragnatha demissa*			
1357.	2823	*Tetragonia implexicoma (Bower Spinach)*			
1358.	1034	*Tetraria capillaris (Hair Sedge)*			
1359.	1036	*Tetraria octandra*			
1360.	35579	*Tetraria sp. Jarrah Forest (R. Davis 7391)*			
1361.	4526	*Tetratheca affinis*			
1362.	4536	*Tetratheca hispidissima*			
1363.		*Thelephora terrestris*			
1364.	1704	*Thelymitra cornicina (Lilac Sun Orchid)*			
1365.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
1366.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
1367.	18248	*Thelymitra granitora*			
1368.	1710	*Thelymitra mucida (Plum Orchid)*			
1369.	1716	*Thelymitra tigrina (Tiger Orchid)*			
1370.	20731	*Thelymitra vulgaris*			
1371.	5091	*Thomasia paniculata*			
1372.	5092	*Thomasia pauciflora (Few Flowered Thomasia)*			
1373.	5094	*Thomasia purpurea*			
1374.	5097	*Thomasia rhynchocarpa*			
1375.	33488	*Thomasia sp. Vasse (C. Wilkins & K. Shepherd CW 581)*			
1376.		*Threpterius maculosus*			
1377.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
1378.	32442	*Thuidium sparsum*			
1379.	28071	*Thysanothecium scutellatum*			
1380.	1333	*Thysanotus glaucifolius*			
1381.	1339	*Thysanotus multiflorus (Many-flowered Fringe Lily)*			
1382.	1354	*Thysanotus tenellus*			
1383.		*Tipulidae sp.*			
1384.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
1385.		*Torquigener pleurogramma*			
1386.		*Tortula sp.*			
1387.	19045	*Trachymene grandis*			
1388.	38844	*Trametes versicolor*			
1389.	4547	*Tremandra diffusa*			
1390.	4548	*Tremandra stelligera*			
1391.	1481	*Tribonanthes australis (Southern Tiurndin)*			
1392.	24754	*Trichoglossus haematodus subsp. rubritorquis (Red-collared Lorikeet)*			
1393.	32450	*Trichostomum eckelianum*			
1394.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
1395.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
1396.	17145	*Trifolium angustifolium var. angustifolium*	Y		
1397.	17542	*Trifolium arvense var. arvense*	Y		
1398.	17763	*Trifolium campestre var. campestre (Hop Clover)*	Y		
1399.	4293	*Trifolium cernuum (Drooping Flower Clover)*	Y		
1400.	4295	*Trifolium dubium (Suckling Clover)*	Y		
1401.	4302	*Trifolium ligusticum (Ligurian Clover)*	Y		
1402.	4312	*Trifolium striatum (Knotted Clover)*	Y		
1403.	4313	*Trifolium subterraneum (Subterranean Clover)*	Y		
1404.	15509	*Trifolium tomentosum var. tomentosum*	Y		
1405.	151	*Triglochin striata*			
1406.	32451	*Triquetrella papillata*			
1407.	33438	*Trymalium odoratissimum subsp. trifidum*			
1408.	15145	*Trymalium venustum*			
1409.		*Tubaria rufofulva*			
1410.	48147	*Turnix varius (Painted Button-quail)*			
1411.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
1412.	4317	*Ulex europaeus (Gorse)*	Y		
1413.	28087	*Usnea inermis*			
1414.	28090	*Usnea rubicunda*			
1415.	7148	*Utricularia multifida*			
1416.	7150	*Utricularia simplex (Bluecoats)*			
1417.		*Vanacampus phillipi*			
1418.	25577	*Vanellus miles (Masked Lapwing)*			
1419.	25225	*Varanus rosenbergi (Heath Monitor)*			
1420.		*Veliidae sp.*			
1421.	7662	*Velleia macrophylla (Large-leaved Velleia)*			
1422.	7665	*Velleia trinervis*			
1423.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
1424.		*Venator immansueta*			

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1425.		*Venatrix pullastra*			
1426.	7107	*Verbascum virgatum (Twiggy Mullein)*	Y		
1427.	36096	*Verbena incompta (Purple-top Verbena)*	Y		
1428.	7108	*Veronica arvensis (Wall Speedwell)*	Y		
1429.	7109	*Veronica calycina (Cup Speedwell)*			
1430.	24206	*Vespadelus regulus (Southern Forest Bat)*			
1431.	4320	*Vicia hirsuta (Hairy Vetch)*	Y		
1432.	11474	*Vicia sativa subsp. nigra*	Y		
1433.	11137	*Vulpia fasciculata*	Y		
1434.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
1435.	33101	*Vulpia myuros forma myuros*	Y		
1436.		*Vulpia sp.*			
1437.	32455	*Weissia controversa*			
1438.	6939	*Westringia dampieri*			
1439.	12072	*Wurmbea dioica subsp. alba*			
1440.	1402	*Wurmbea sinora*			
1441.	28124	*Xanthoparmelia dissitifolia*			
1442.	29033	*Xanthoparmelia glabrans*			
1443.	28165	*Xanthoparmelia parvoincerta*			
1444.		*Xanthoparmelia sp.*			
1445.	28182	*Xanthoparmelia tasmanica*			
1446.	44996	*Xanthoria coomae*			
1447.	28194	*Xanthoria parietina*			
1448.	1253	*Xanthorrhoea gracilis (Graceful Grass Tree, Mimidi)*			
1449.	6284	*Xanthosia candida*			
1450.	6289	*Xanthosia huegelii*			
1451.	6292	*Xanthosia rotundifolia (Southern Cross)*			
1452.	44861	*Xerochrysum macranthum*			
1453.	1144	*Xyris flexifolia*			
1454.	1150	*Xyris lanata*			
1455.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
1456.	32457	*Zygodon intermedius*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX 4

Protected Matters Search Tool Report

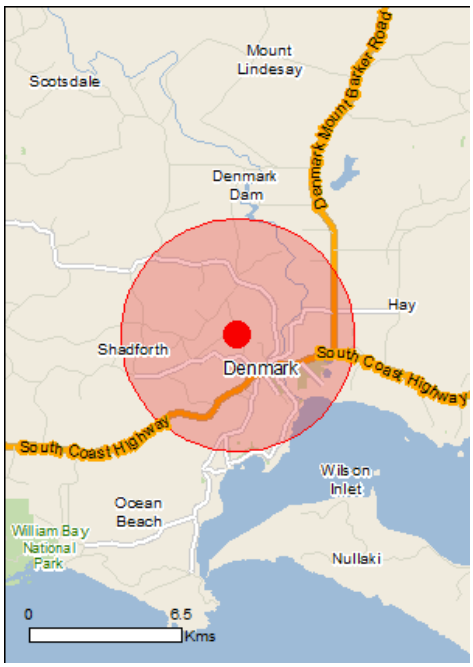
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

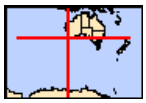
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 09/11/20 17:16:57



Coordinates
Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	49
Listed Migratory Species:	52

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	75
Whales and Other Cetaceans:	8
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	5
Regional Forest Agreements:	1
Invasive Species:	22
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Breeding known to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely

Name	Status	Type of Presence
		to occur within area
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
[Limosa lapponica baueri](#) Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
[Limosa lapponica menzbieri](#) Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Pachyptila turtur subantarctica](#) Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
[Sternula nereis nereis](#) Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fish		
[Galaxiella nigrostriata](#) Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area
[Nannatherina balstoni](#) Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat known to occur within area
[Nannoperca pygmaea](#) Little Pygmy Perch [88315]	Endangered	Species or species habitat likely to occur within area
Mammals		
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
[Dasyurus geoffroii](#) Chuditch, Western Quoll [330]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
Parantechinus apicalis Dibbler [313]	Endangered	Species or species habitat likely to occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
Other		
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Caladenia harringtoniae Harrington's Spider-orchid, Pink Spider-orchid [56786]	Vulnerable	Species or species habitat likely to occur within area
Commersonia apella Many-flowered Commersonia [86877]	Critically Endangered	Species or species habitat may occur within area
Conostylis misera Grass Conostylis [21320]	Endangered	Species or species habitat may occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Isopogon uncinatus Albany Cone Bush, Hook-leaf Isopogon [20871]	Endangered	Species or species habitat may occur within area
Sphenotoma drummondii Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area
Verticordia apecta Hay River Featherflower, Scruffy Verticordia [65545]	Critically Endangered	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence
		within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea		
Sooty Shearwater [82651]		Species or species habitat may occur within area
Diomedea antipodensis		
Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea dabbenena		
Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora		
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia		
Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis		
Southern Right Whale [75529]	Endangered*	Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Xenus cinereus		
Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres		
Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba		
Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus griseus Sooty Shearwater [1024]		Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Sterna caspia Caspian Tern [59467]		Breeding known to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat likely to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
McLean Road	WA
NTWA Bushland covenant (0017)	WA
NTWA Bushland covenant (0142)	WA
Redmond Road	WA
Scotsdale Road	WA

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-34.94955 117.34337

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX 5

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. Conservation codes have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018.*

T Threatened species – Schedules 1-4

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

- **Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
- **Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife*

Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

EX Presumed extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;

(iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
b) the following subparagraphs are satisfied:
    i. the species is a species of fish;

ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

APPENDIX 6

DBCA TEC/PEC Database Searches

OCC_UNIQUE	COM_ID	COM_NAME	STATE_CATG	COMM_CATG	S_ID_COUNT	FIRST_S_ID	LAST_S_ID	BUFFER	OCC_CONFID	BDY_ID	ORIG_FID
435	Mount Lindesay	Mount Lindesay - Little Lindesay Vegetation	Endangered		1	ML207		500	No	528	402
2142	Mount Lindesay	Mount Lindesay - Little Lindesay Vegetation	Endangered		1	ML208-1		500	No	532	406
4570	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs07		500	No	2501	2097
4571	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs08		500	No	2502	2098
4572	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs09		500	No	2503	2099
4573	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		2	Youngs10	Youngs11	500	No	2504	2100
4574	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs12		500	No	2505	2101
4575	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs13		500	No	2506	2102
4676	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs14		500	No	2589	2188
4677	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs15		500	No	2590	2189
4678	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs16		500	No	2591	2190
4679	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs17		500	No	2592	2191
4680	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs18		500	No	2593	2192
4681	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs19		500	No	2594	2193
4682	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs20		500	No	2595	2194
4683	Melaleuca spathulata/ Melaleuca viminea	Melaleuca spathulata/Melaleuca viminea Swamp Heath	Priority 1		1	Youngs21		500	No	2596	2195
5654	Coastal Saltmarsh	Subtropical and Temperate Coastal	Priority 3	Vulnerable	1	WilsInNE		500	No	3336	2923
5655	Coastal Saltmarsh	Subtropical and Temperate Coastal	Priority 3	Vulnerable	1	WilsInE01		500	No	3337	2924
5656	Coastal Saltmarsh	Subtropical and Temperate Coastal	Priority 3	Vulnerable	1	WilsInE02		500	No	3338	2925
5657	Coastal Saltmarsh	Subtropical and Temperate Coastal	Priority 3	Vulnerable	1	NenamupIn		500	No	3339	2926
5658	Coastal Saltmarsh	Subtropical and Temperate Coastal	Priority 3	Vulnerable	1	YoungsLake		500	No	3340	2927
5659	Coastal Saltmarsh	Subtropical and Temperate Coastal	Priority 3	Vulnerable	1	WilsInSW		500	No	3341	2928

APPENDIX 7

Flora Species List

SPECIES LIST – Lot 349 Kearsley Road Denmark

PTERIDOPHYTES

DENNSTAEDTIACEAE
Pteridium esculentum

MONOCOTYLEDONS

ASPARAGACEAE
Lomandra sp

CYPERACEAE
Lepidosperma effusum
Lepidosperma gracile

ORCHIDACEAE
Eriochilus dilatatus
Thelymitra macrophylla

POACEAE
Tetrarrhena laevis

DICOTYLEDONS

ASTERACEAE
Trichocline spathulata

CASUARINACEAE
Allocasuarina decussata

DILLENIACEAE
Hibbertia commutata
Hibbertia cuneiformis

ERICACEAE
Leucopogon obovatus subsp. *revolutus*
Leucopogon verticillatus
Needhamiella pumilio

FABACEAE
Acacia pentadenia subsp. *pentadenia*
Chorizema ilicifolium
Hovea elliptica

GOODENIACEAE
Dampiera hederacea

LAURACEAE
Cassytha racemosa

MALVACEAE
Thomasia foliosa
Thomasia sp Vasse

MYRTACEAE
Corymbia calophylla
Eucalyptus diversicolor
Eucalyptus guilfoylei
Taxandria parviceps

PITTOSPORACEAE
Billardiera laxiflora

RANUNCULACEAE
Clematis pubescens

RHAMNACEAE
Trymalium odoratissimum subsp. *trifidum*

RUBIACEAE
Opercularia echinocephala

RUTACEAE
Boronia gracilipes
Chorilaena quercifolia

APPENDIX 8

Quadrat Data

QUADRAT KR 1

50 531304 E 6132245 N

Vegetation: *Eucalyptus diversicolor/Eucalyptus guilfoylei* Open Forest over *Acacia pentadenia/Lepidosperma effusum* Shrubland over leaf litter
Condition: Excellent
Soil Type: Dark orange-brown sandy loam, some laterite at surface
Landform: Moderate slope
Date: 15.10.20
Recorder: Paul van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus diversicolor	15	30
Eucalyptus guilfoylei	12	10
Acacia pentadenia	2.5	10
Lepidosperma effusum	1.6	10
Hibbertia cuneiformis	1.2	1
Chorilaena quercifolia	0.5	2
Pteridium esculentum	0.5	1
Chorizema ilicifolium	0.1	2
Opercularia echinocephala	0.1	<1
Billardiera laxiflora	Climber	2
Cassytha racemosa	Climber	<1

* introduced species

QUADRAT KR 2

50 531192 E 6132319 N

Vegetation: *Eucalyptus guilfoylei/Eucalyptus diversicolor* Open Forest over *Taxandria parviceps/Hibbertia cuneiformis* Shrubland over leaf litter
Condition: Excellent
Soil Type: Dark orange-brown sandy loam, some laterite at surface
Landform: Moderate slope
Date: 15.10.20
Recorder: Paul van der Moezel

QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus guilfoylei	12	30
Eucalyptus diversicolor	12	5
Acacia pentadenia	1.9	2
Taxandria parviceps	1.7	10
Leucopogon verticillatus	1.1	2
Hibbertia cuneiformis	0.9	4
Hovea elliptica	0.8	<1
Lepidosperma effusum	0.7	2
Lomandra sp	0.3	20
Chorizema ilicifolium	0.3	5
Chorilaena quercifolia	0.3	2
Hibbertia commutata	0.3	<1
Billardiera laxiflora	Climber	2

* introduced species

QUADRAT KR 3

50 531320 E 6132114 N

Vegetation: *Eucalyptus guilfoylei/Eucalyptus diversicolor* Open Forest over *Trymalium odoratissimum/Lepidosperma effusum* Shrubland over leaf litter
Condition: Excellent
Soil Type: Dark orange-brown sandy loam, some laterite at surface
Landform: Moderate slope
Date: 15.10.20
Recorder: Paul van der Moezel

Quadrat (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
Eucalyptus diversicolor	15	10
Eucalyptus guilfoylei	12	30
Allocasuarina decussata	4	2
Trymalium odoratissimum	2-3.5	10
Leucopogon verticillatus	1.2	2
Hibbertia cuneiformis	1	1
Lepidosperma effusum	0.6	20
Chorilaena quercifolia	0.3	1
Billardiera laxiflora	Climber	<1

* introduced species

Appendix C- Previous Subdivision Application lodged with WAPC

LEGEND

- APPLICATION AREA
- EXISTING DWELLING
- REMNANT VEGETATION
- FUTURE ROAD RESERVE WIDENING
- EXISTING WATER MAIN

PLAN OF SUBDIVISION

LOT 9000 and 349 KEARSLEY ROAD
DENMARK, WA

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 29 Nov 2018 | ref - 18-008-01
scale - 1:3000 @ A3

N 0m 30m

Appendix D- Certificates of Title

WESTERN AUSTRALIA

REGISTER NUMBER	
349/DP230731	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
2	27/12/2006

VOLUME 1797 FOLIO 438

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 349 ON DEPOSITED PLAN 230731

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

SUN LAND PTY LTD OF POST OFFICE BOX 140, CLAREMONT

(T K020446) REGISTERED 12/12/2006

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *K803355 MORTGAGE TO BANK OF WESTERN AUSTRALIA LTD REGISTERED 17/12/2008.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	1797-438 (349/DP230731)
PREVIOUS TITLE:	1761-806
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF DENMARK

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF DENMARK TOWN LOT/LOT 349 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 349 ON DEPOSITED PLAN 230731 ON 14-AUG-02 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.

NOTE 3: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING K803355

WESTERN AUSTRALIA

REGISTER NUMBER	
9000/DP77503	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	**N/A**

RECORD OF CERTIFICATE OF TITLE

VOLUME **2834** FOLIO **927**

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 9000 ON DEPOSITED PLAN 77503

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

PETER JOHN ROBERTSON OF 40 MINORA ROAD, DALKEITH
(AF M574877) REGISTERED 12 MARCH 2014

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1.	*J847459	MORTGAGE TO BANK OF WESTERN AUSTRALIA LTD REGISTERED 26.7.2006.
2.	*M549774	EASEMENT TO WATER CORPORATION FOR PIPELINE PURPOSES - SEE SKETCH ON DEPOSITED PLAN 77503 REGISTERED 13.2.2014.
3.	*M574880	RESTRICTIVE COVENANT TO SHIRE OF DENMARK REGISTERED 12.3.2014.
4.	*M574879	CAVEAT BY WESTERN AUSTRALIAN PLANNING COMMISSION LODGED 12.3.2014.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

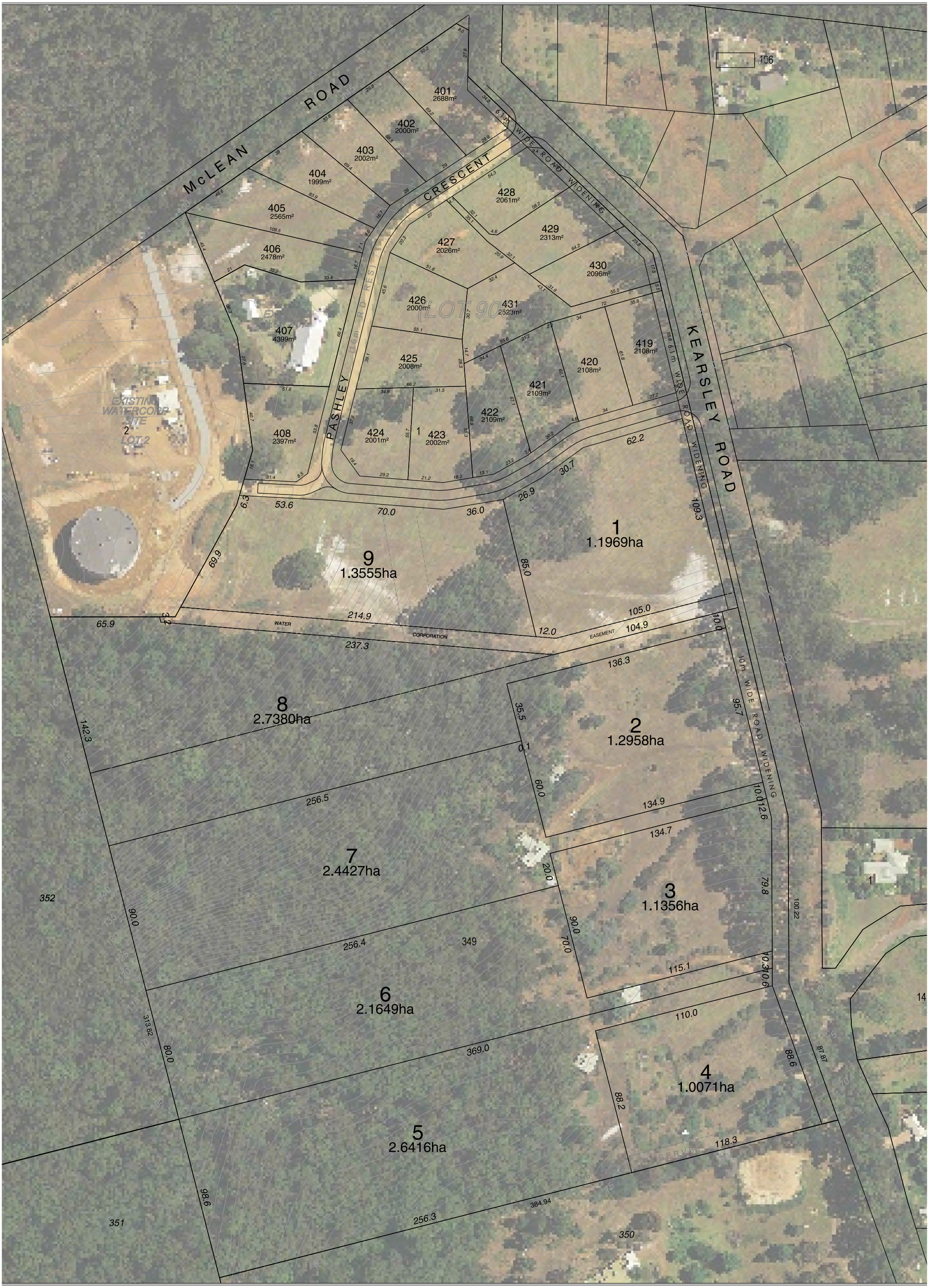
STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP77503.
PREVIOUS TITLE: 2692-284.
PROPERTY STREET ADDRESS: 67 KEARSLEY RD, DENMARK.
LOCAL GOVERNMENT AREA: SHIRE OF DENMARK.

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING J847459

Appendix E- Previous Structure Plan Amendment Design



PROPOSED STRUCTURE PLAN

LOT 9000 and 349 KEARSLEY ROAD

DENMARK, WA

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 20 Jan 2020 | ref - 20-001-001

scale - 1:2000 @ A3

Appendix F- Infrastructure Report

TABEC
Civil Engineering Consultants

LOT 349 KEARSLEY ROAD, DENMARK

Engineering Infrastructure Report

November 2021

CLIENT: **RC DEVELOPMENTS C/- WILLIAMS CONSULTING**

PROJECT: **LOT 349 KEARSLEY ROAD, DENMARK WA**

TITLE: **LOT 349 KEARSLEY ROAD DENMARK: ENGINEERING INFRASTRUCTURE REPORT**

DOCUMENT REVIEW				
Revision	Date Issued	Written By	Reviewed By	Approved By
1	15/02/2021	JBSMALL	JBSMALL	CCBITMEAD
2	18/02/2021	JBSMALL	JBSMALL	CCBITMEAD
3	04/11/2021	JBSMALL	JBSMALL	CCBITMEAD

TABLE OF CONTENTS

1 INTRODUCTION

This report has been prepared by TABEC to provide broad servicing and infrastructure advice for the proposed subdivision of Lot 349 and a portion of Lot 9000, Kearsley Road Denmark. The review is based on the Structure Plan Map prepared by Williams Consulting dated February 2021.

This report is based on the civil engineering aspects required to deliver the proposed residential subdivision and summarises the location and availability of existing infrastructure in the area.

The investigation and preparation of the report includes the advice from various service authorities, advice from other consultants and experience in the locality. The information is subject to change as further detail is resolved during the design phases, though is current as of November 2021.

Figure 1 illustrates the location of the location of Lot 349 and a portion of Lot 9000 on the aerial image.

Figure 1 – Site location and aerial image (Nearmap)

2 THE STUDY AREA

The proposed development site is 13.03ha which comprises 12.315ha of Lot 349 and 0.72ha from a portion of Lot 9000. Bot lots are located to the immediate west of Kearsley Road. As seen above, Lot 349 is generally square shaped with north-south dimension of approximately 315m and east-west approximately 385m. Kearsley Road exists only for approximately 65m of the frontage to Lot 349, before becoming Wishart Place. The remaining section of Kearsley Road is currently unmade. Lot 349 is located 415m south of McLean Road and about 300m north of Shadforth Road.

There is an existing Water Corporation easement through Lot 9000 to protect existing 500mm and 375mm water mains.

Approximately 60% of Lot 349 is densely vegetated, with the eastern previously cleared. There appears existing houses, sheds, vehicle tracks, fences and rural type facilities as existing improvements all located in the previously cleared areas.

There is existing large vegetation along the boundary of the Kearsley Road reserve.

An extract from the current Structure Plan Map is included in Figure 2. The current estimated yield for the development of Lot 349 is 40 residential lots. This includes three lots and a drainage reserve in a portion of Lot 9000. It is noted the final lot yield is subject to progression of the engineering design including resolution to a proposed drainage basin size and location. The majority of the nominated lots are around 50m in depth by 30m wide.

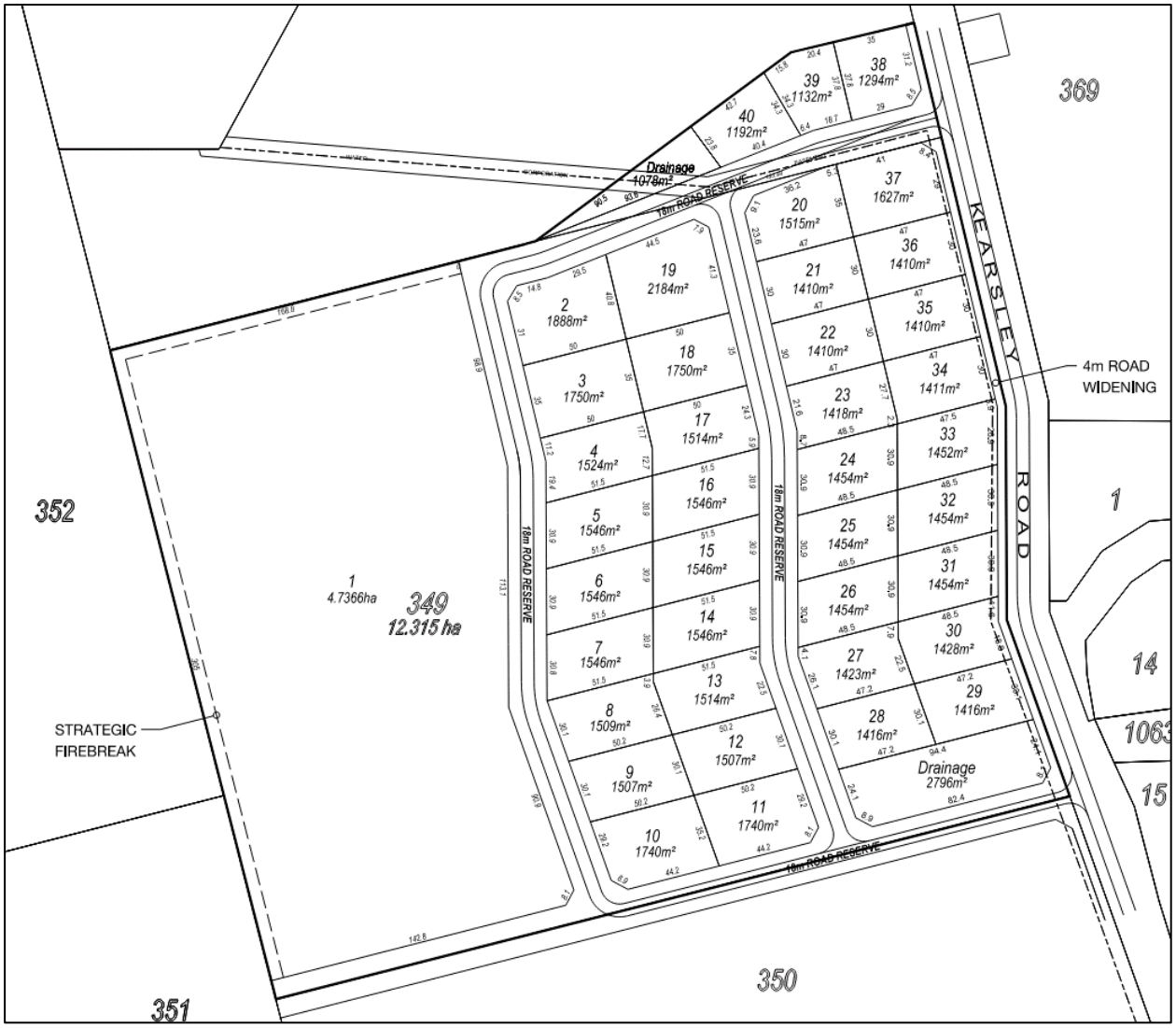


Figure 2 – Concept Development Plan (Williams Consulting)

2.1 Landform

Preliminary survey information provided by Denmark Survey and Mapping in shows 1m contours across the development area. The existing surface elevations shown as contour banding included in Figure 3.

Both Lots 349 and 9000 contain very steep grades. The image shows the highest location on site is in the north-west corner, at an approximate elevation of 153mAHD. There is large amount of fall of approximately 85m across Lot 349 toward the south-east corner near Kearsley Road where the elevation is approximately 68mAHD. The average grade across the existing contours is therefore approximately 1 in 6 or 17% which is considered very steep, though noting this is an average grade, with steeper sections in the north-west corner, up to about 32% or approximately 1 in 3.

Along the Kearsley Road reserve on the eastern boundary of Lot 349, there is 42m of fall, with a level of 110m at the northern boundary. The grade along Kearsley Road is therefore an average of 13%.

Beyond Lot 349, about 150m north there is a high-point in the localised landform at elevation of 166mAHD. This forms the extent of the drainage catchment boundaries, which will direct overland runoff toward Lot 349. The site is therefore located in steep terrain.

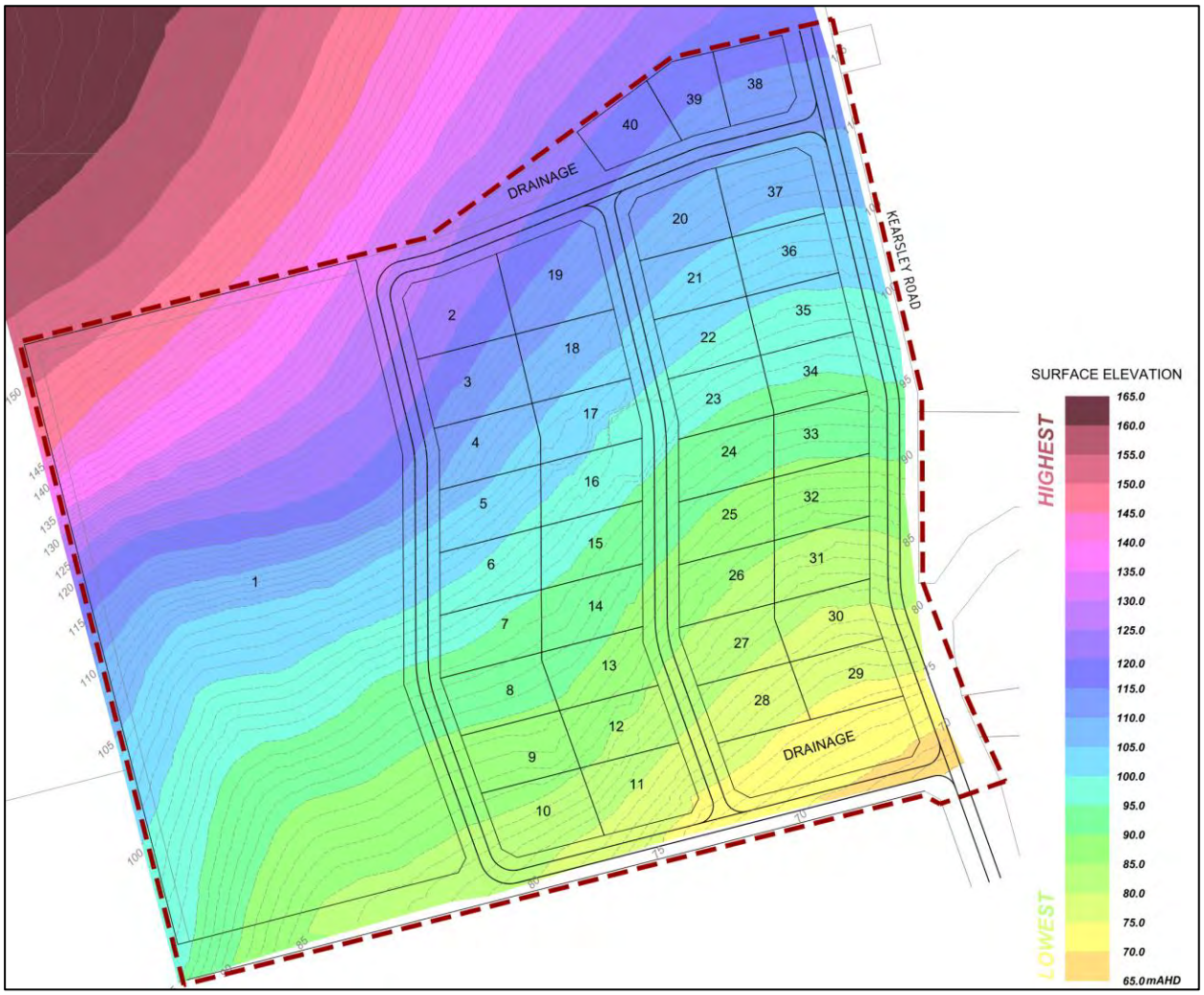


Figure 3 – Existing surface levels and contour banding (TABEC)

2.2 Groundwater and Acid Sulphate Soils

Given the elevated nature of the site, the groundwater table is not anticipated to be encountered onsite, however perched water may be found in shallow excavations which may require dewatering during construction activities onsite.

Excavations works related to the proposed subdivision are not expected to be greater than 3.0m in depth. Also, works are not within 500m of a known wetland. According to the Department of Water and Environmental Regulation, the risk of encountering acid sulphate soils generally increases in water-logged, high groundwater table environments.

As there is a limitation on the amount of soil disturbance related to the subdivision works, generally the risk of encountering acid sulphate soils inside Lots 349 or 9000 Kearsley Road is therefore considered to be low.

3 SITEWORKS

In order to prepare the site for the proposed urban development, where necessary, areas will be cleared of existing vegetation where necessary with grubbing out of the roots. Topsoil will be stripped to remove any shallow organic and root matter, which is generally expected in varying depths between approximately 100mm to 200mm.

3.1 Tree Protection

Since Lot 349 contains dense vegetation in the western areas, where the majority of existing vegetation is intended to be protected and retained. Site works will be limited to the proposed road reserves.

In other vegetated areas, such as the Kearsley Road boundary, the civil design outcomes would intend to retain the trees, however some clearing may be necessary in order to complete road construction and services installation and to provide cross-over access for lots fronting Kearsley Road.

The location of the proposed drainage basin will require earth working in order to contain the required storm events, and therefore clearing and re-contouring would be necessary in the south-east corner of Lot 349 and also for the basin shown in the portion of Lot 9000. The exact size and shape of the proposed drainage basins is subject to more detailed engineering design reviews.

Otherwise, typically vegetation within ±150mm earthwork band and outside the service trenching requirements can be retained and this would be the intention for the majority of Lot 349.

4 EARTHWORKS

4.1 Ground Conditions

Given the topography across the Structure Plan Map and in view of the surrounding areas, the ground conditions are expected to contain gravel materials, with potential rock, sandy-clay and sandy-gravels.

While there is currently no available geotechnical report from site investigations, this would be completed prior to commencing civil works designs to ensure adequate site preparation requirements were documented along with the review of a suitable pavement design, specific to the site conditions. The

investigation would include excavation of various test pits to provide visual inspection of the ground conditions and for samples to be collected for geotechnical assessment.

Given the sandy-clay material that is anticipated, there is likely to be medium plasticity and some cohesive soil properties. A detailed geotechnical investigation would assess the ground strength along the proposed road reserves.

In particular, the California Bearing Ratios (CBR) for the various material types onsite should be confirmed. While sandy or gravel material would provide a strong, suitable sub-base for road and services installation, potential weaker sandy-clay may have very low CBR values and if considered soft, would be unsuitable for a road subgrade, service trench bedding or backfill material. In which case, adequate bedding and sub-base material would need to be included in the civil works construction.

A low CBR is not unexpected for clayey materials and options to increase the road subgrade strength will need to be considered. This may include re-use of gravel from other areas onsite, over-excavating the clayey material and replacement with backfilling of structurally suitable sand for an improved compacted subbase, or increasing the pavement thickness to improve the strength over softer clay materials. Similarly, sand may need to be used for service trench backfilling to provide suitable compaction and pipe support, especially in trafficable locations.

4.2 Site Preparation

Given the lot sizes are all generally greater than about 1,200m2, re-grading of the site in order to support the development form is intended to be limited to road reserves, with encroachments into residential lots only for the proposed extent of earthworks batters. The concept earthworks plan includes 2% verges in all road reserves, and then batters nominated at 1:3 to meet natural ground levels onsite. Given the fall across Lot 349, this will result in both cut and fill batters accordingly.

The extent of the earthworks batters is indicated on Figure 5 which shows modified contours as a hatching outside the coloured road reserves. Based on the current model, the north-west corner of the site shows a batter extending approximately 20m outside the road reserve boundary into Lot 9000. In order to minimise clearing as much as possible, a stone-pitched 1:1.5 batter is proposed. Access and a negotiated outcome with the adjoining land owner is therefore required, for further assessment during detailed design stage.

While earthworks are only intended to be limited to the roadworks and to facilitate services installations, an indicative cross-section is included in Figure 4 to demonstrate how future lot owners may locally regrade building pads within the lots. No retaining is proposed and level differences would be made-up with earth batters.

The earthworks methodology is likely to involve clearing where necessary, followed by stripping of topsoil, organic and any other deleterious material onsite within road reserves and areas which are to be re-contoured. The earthworks program will require the compaction of any identified loose ground material. It is recommended that the exposed ground beneath earthworks footprints including pavement areas be proof rolled with a vibrating smooth drum roller of say 14 tonnes deadweight.

A depth of 0.5 m of medium dense or denser sand is suggested below subgrade level for the road network. A compaction level of not less than 8 blows per 300 mm Perth sand penetrometer (PSP) penetration at least to a depth of 0.5m below standard pavements is a general recommendation. Due to the expected presence of clayey material onsite, any areas that show signs of excessive deformation during compaction

should be compacted until deformation ceases or, alternatively, the poor quality material should be excavated and replaced with suitable structural filling and compacted.

To allow detailed engineering design, geotechnical advice shall be sought to confirm earthworks and ground preparation methodologies.

The locations of building pads within each of the lots may be pre-determined, otherwise it is expected that lot owners will locally earthworks the extent of proposed building pads.

5 ROADWORKS

Currently, the only formal road frontage to Lot 349 is about 60m of Kearsley Road, before it bends to the east and connects to Wishart Place. There is however a gravel access track along the Kearsley Road reserve which extends through to McLean Road in the existing road reserve. The greater portion of Lot 9000 is accessible from McLean Road to the north.

As shown on the Structure Plan Map, the proposed subdivision is intended to be serviced with 18m wide road reserves. And as noted previously, Kearsley Road is proposed to include a 4m widening to protect Water Corporation's existing 500mm steel main.

The road shown inside a portion of Lot 9000 will need to accommodate existing Water Corporation trunk water mains with adequate protections during the works. The alignments shall be confirmed and adopted into the progression of planning documents.

Kearsley Road would need to be constructed to the full extent of the Lot 349 frontage in order to provide formalised access to the proposed 9 lots along the eastern boundary. To minimise clearing along Kearsley Road, shared crossovers would be proposed for lots fronting Kearsley Road.

The Structure Plan Map indicates shared road alignments and access with land owner of Lot 350 to the south of Lot 319. The road reserve connection to Kearsley Road is shared with the road centreline on the boundary with Lot 350.

Through the densely vegetated western portion of Lot 349, the boundary is proposed to include a 6m wide, cleared, trafficable service access route.

Roads will be paved with asphalt and kerbed in accordance with the Shire of Denmark and Institute of Public Works Engineers Australasia specifications. Alternate treatments, particularly at entry statements may be included in the engineering design.

Included in Figure 5 is a road grade plan based on the preliminary earthworks models which demonstrates how the intended longitudinal grades vary significantly and are steep. The Shire of Denmark Guidelines for Development and Subdivision of Land state that Access Roads shall have an absolute maximum grade of 15%. The preliminary long-section have maintained this design criteria.

As indicated in Figure 6 showing the road profile plan for Road 01, at the location of the bend in the north-west corner of Lot 349, there may be up to approximately 7m of cut in order to satisfy this current road design requirement.

Further refinement of the Structure Plan Map may be considered to improve the earthworks efficiency connected to the road design. This may be considered further in relation to the Shire's maximum acceptable road grade, bending pavement and lot access.

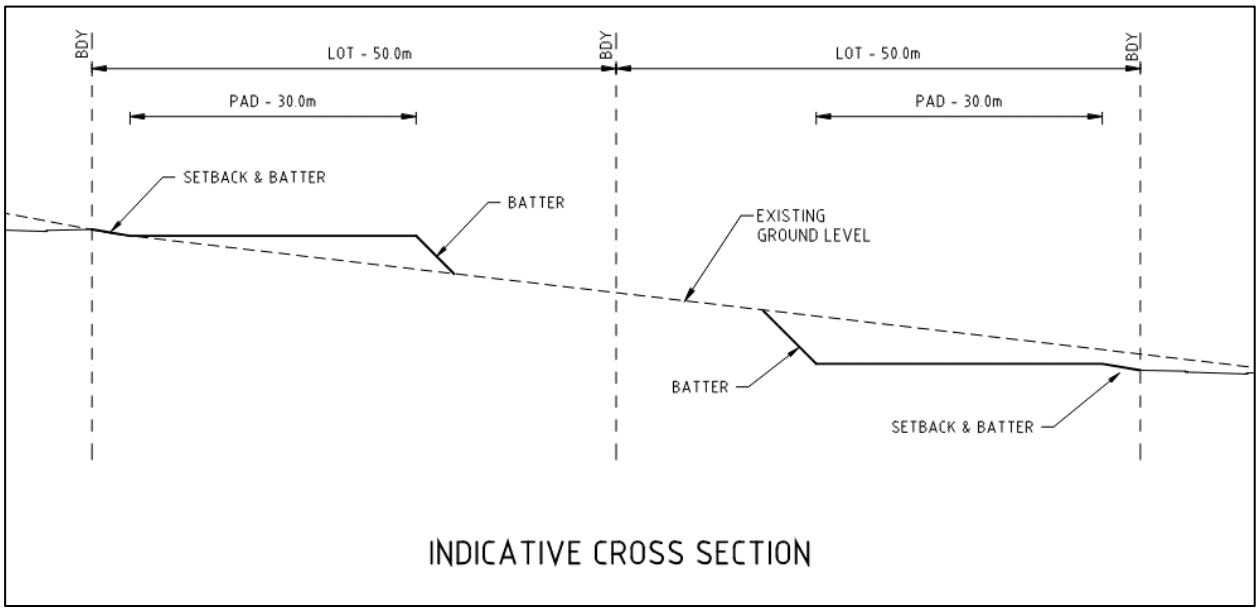


Figure 4 – Indicative earthworks in future lots (TABEC)

Figure 5 – Road Grade Plan (TABEC)

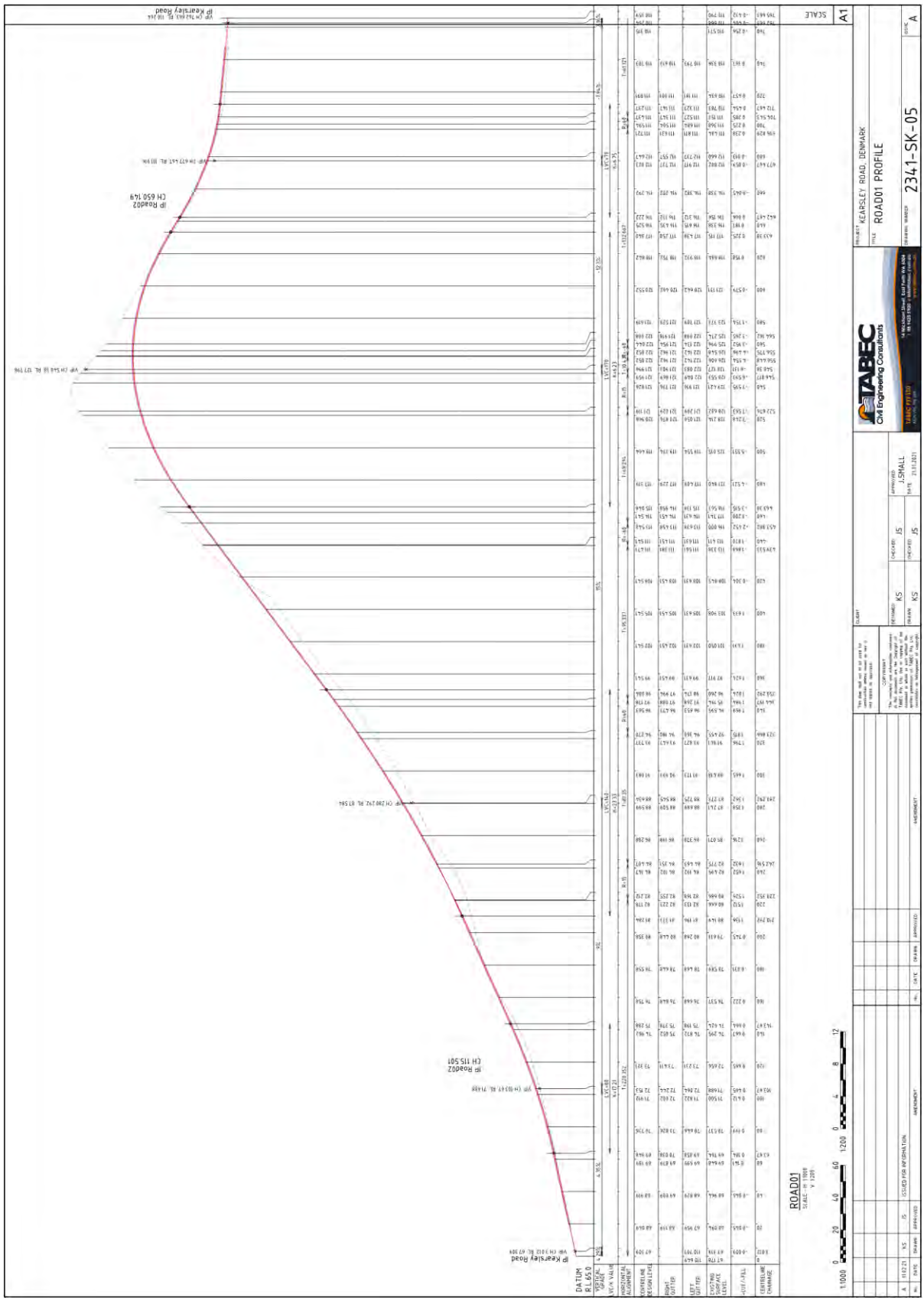


Figure 6 – Proposed Profile for Road 1 (TABEC)

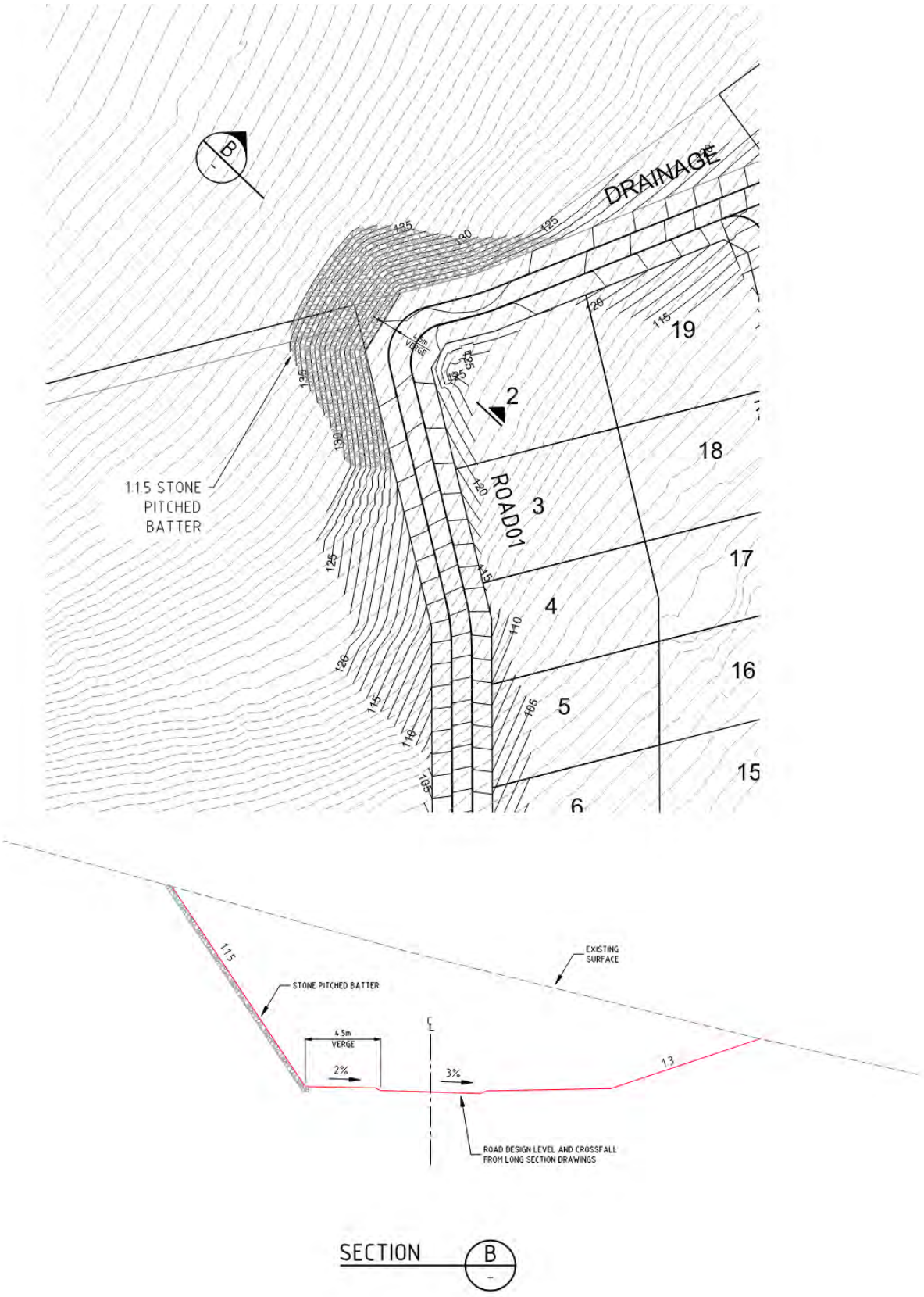


Figure 7 – Proposed Batter Treatment in NW corner (TABEC)

6 STORMWATER DRAINAGE

According to available drainage as-constructed plans, there are currently 225mm diameter stormwater drainage pipes in the eastern verge of Kearsley Road. This appears to drain a portion of Wishart Place, through an easement to a dam located on Lot 16, which is about 85m to the south-east of Lot 349. There is also a separate piped connection draining the Wishart Place culdesac, through an easement at the boundaries of Lots 10 and 11, to the same dam on Lot 16.

Similarly, the southern section of Kearsley Road drains through a 4.0m wide pipe easement, through McIlroy Bend.

The existing piped stormwater drainage system in the surrounding area is therefore not continuous and relies on a variety of easements and localised dams. In addition, the Shire of Denmark has advised that the existing piped system in Kearsley Road is currently at capacity.

Given the ground material has low permeability and steep grades, there is substantial overland run-off which will need to be managed in storm events. Hyd2o were therefore engaged to assess the stormwater drainage requirements for the Structure Plan Map areas, considering detention requirements, and upgraded flow paths downstream toward the creek south of Mount Shadforth Road.

The contributing catchment area to Kearsley Rd from the site is 31.3ha, of which 18.1ha is currently forested and approximately 13.2ha is rural. Hyd2o have completed stormwater modelling to asses 15mm 1 hr event, 20% AEP event, and the 1% AEP event (100 year Average Recurrence Interval event).

In the modelling, lots are assumed to provide 15 mm retention on site consistent with typical Department of Water and Environmental Regulation (DWER) requirements. Larger events were assumed to flow from lots to the road drainage network.

The total area required for flood storage for management of events up to the 1% AEP event is approximately 2,610m2, with a total detention storage volume of approximately 2,250m3. This equates to approximately 2.1% of the site area which is proposed to be constructed in the south-eastern corner of Lot 349, or alternatively may potentially be located in the adjacent Lot 350 if a suitable arrangement can be negotiated with that land owner.

The Hyd2o report states that with respect to the storage outlet, it is recommended that it be designed to accommodate an outflow consistent with the predevelopment flow rate from the site. To achieve this a low level outlet pipe of 525mm diameter will be required.

Since there is no existing opportunity for a piped system to connect to, and lack of capacity in the existing downstream facilities in Kearsley Road, the outlet will require an upgraded flow path to manage overland stormwater flows in major events. This will need to be negotiated with the adjacent landholdings.

The proposed outcome and final agreement shall be documented in an Urban Water Management Plan during the design phase in the subdivision of Lot 349 and a portion of Lot 9000.

With respect to minor events, stormwater runoff collected via the road network to a conventional pit and pipe drainage network. The road network will generally be designed with one-way cross-falls to efficiently capture stormwater. The piped stormwater system including outlet structures will be designed and constructed according to Shire of Denmark engineering guidelines.

Extracted figures from the Hyd2o drainage assessment and included in Figures 8 and 9.

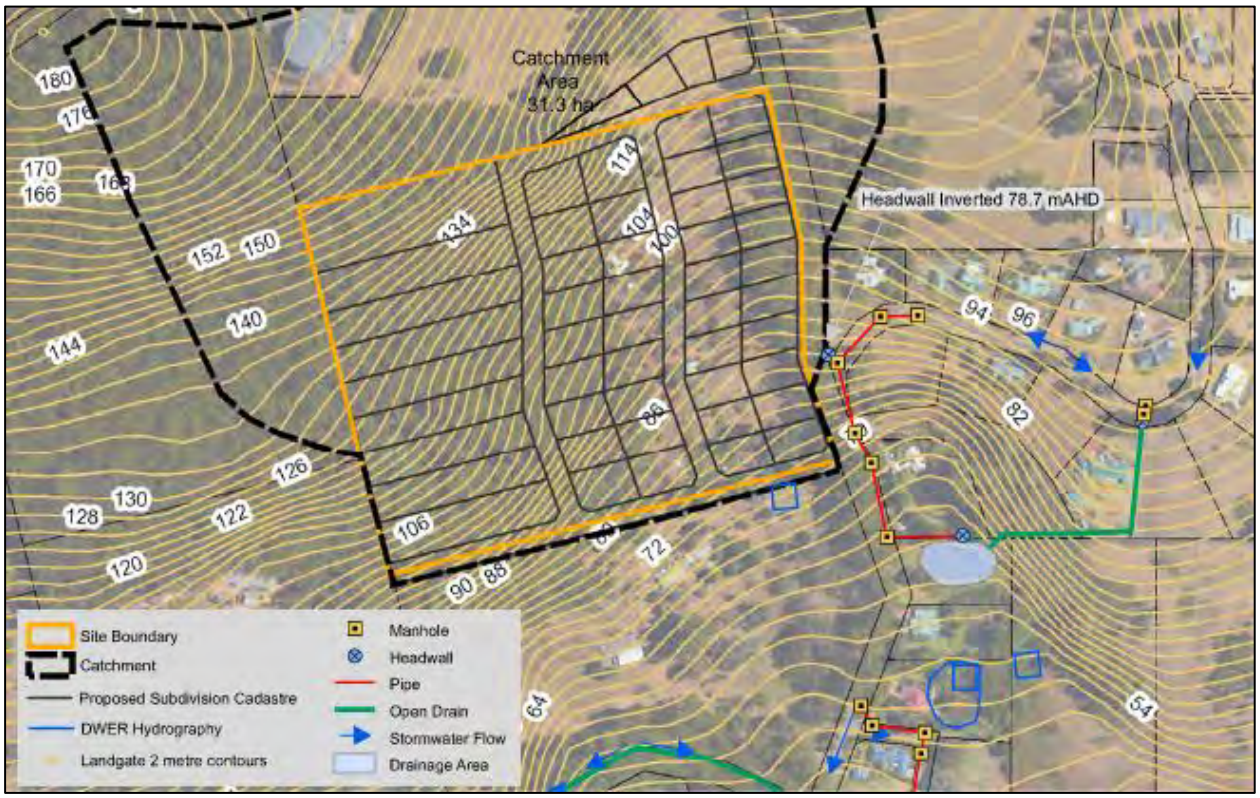


Figure 8 – Stormwater Drainage Catchment Plan (Hyd2o)

Figure 9 – Stormwater Management Plan (Hyd2o)

7 WASTEWATER

The nearest Water Corporation reticulated sewer is located in Barrett Heights, which is located approximately 450m east of the Lot 349 boundary. There is also existing sewer located in Willow Creek Drive near the intersection of Mount Shadforth Road. Both sewers are part of a larger catchment which grades to the Holling Road Waste Water Pump Station, near South Coast Highway intersection.

Notwithstanding capacity reviews which require further assessment by Water Corporation including assessments of any headworks infrastructure items, the Willow Creek Drive connection appears the most suitable proposed connection point to discharge sewer from Lots 349 and a portion of Lot 9000.

Access to sewer in Barrett Heights would rely on negotiated access with easements through land holdings and is therefore not a preferable outcome.

The invert of the sewer at Willow Creek Drive is 30.48mAHD. The approximately surface contour is about 32mAHD in that location, which consistently rises up toward Lot 349 on Kearsley Road. A proposed sewer connection to Willow Creek Drive would require an approximate 640m offsite extension, in existing road reserves. Sections of the route are heavily vegetated and it would be expected that installation through boring and trenchless techniques are necessary, along with traffic management.

The extent of existing sewers is shown in Figure 10 with a potential route for the sewer extension and connection to Willow Creek Drive indicated.

For sewer installation to service the proposed subdivision, including offsite works, the developer will be responsible for funding all construction works. Standard Water Corporation headworks contributions per lot will also apply.

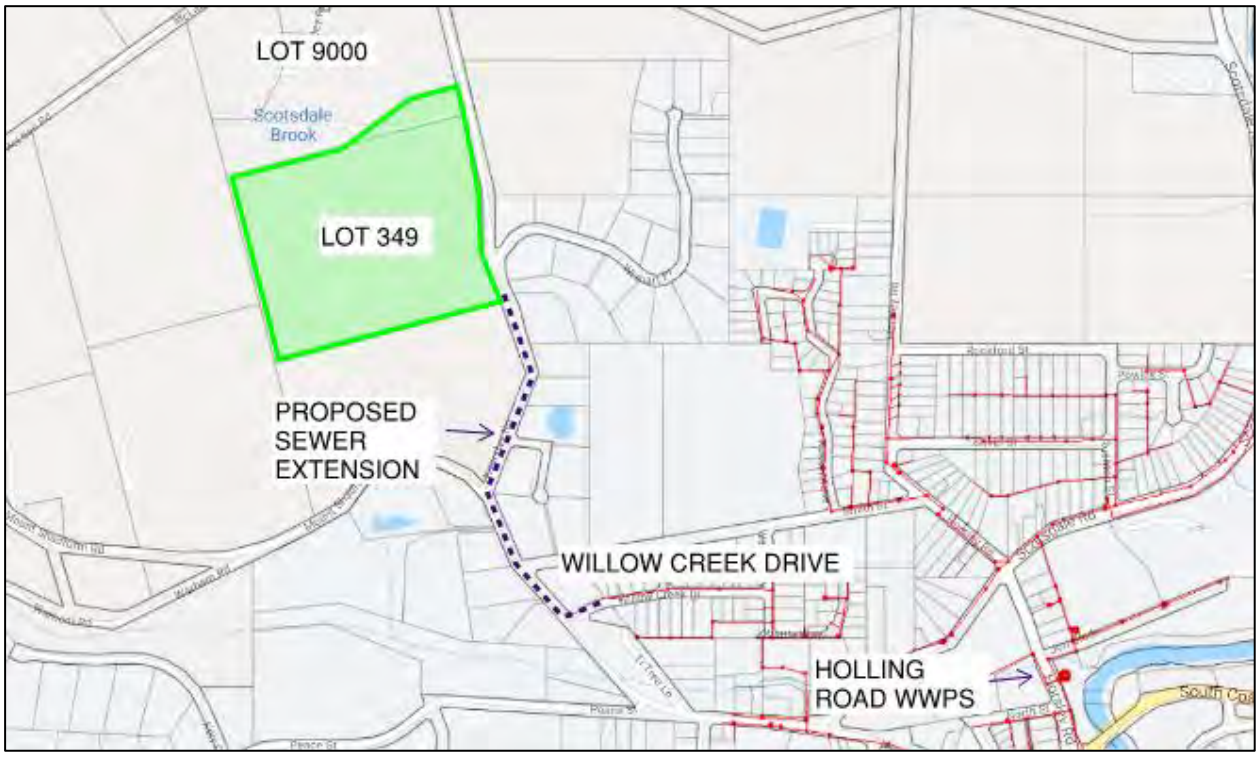


Figure 10 – Waste Water Planning, June 2019 (Water Corporation)

8 WATER SUPPLY

Currently, there are various Water Corporation assets in proximity to Lots 349 and 9000 and along Kearsley Road, which have been identified on the Structure Plan Map.

To the north of Lot 349 is Water Corporation's McLean Road high level tank, with a top water level of 174.1mAHD. There is also the Kearsley Road tank with a top water level of 115.0mAHD, located to the north-west of Lot 349.

Since the highest elevation on Lot 349 is 153mAHD, and generally all residential areas will likely be at about, or below the 135m contour, it would appear the McLean Road high level tank may provide sufficient head pressure to service all lots with in the proposed development on lot 349.

Notwithstanding capacity reviews, given the top water level in the Kearsley Road tank is at a lower level, approximately half of the proposed residential lots within Lot 349 could not be serviced from that supply without booster pumps.

From the McLean Road high level tank, there are two water mains, which run toward the south-east, to Kearsley Road. These include a 375mm main which continues east, to Wishart Place. There is also a 500mm steel main, which runs south parallel to Kearsley Road.

The 500mm steel main is inside the existing Lot 349 boundary and a portion of Lot 9000, and is of major importance to the water supply scheme in the area. The current Structure Plan Map therefore includes a 4m road widening to ensure uninterrupted access and protection to the existing pipe. The road reserve will need to contain and protect the existing major trunk water mains.

The existing Water Corporation pipelines, locations of the high levels tanks are shown in Figure 11.

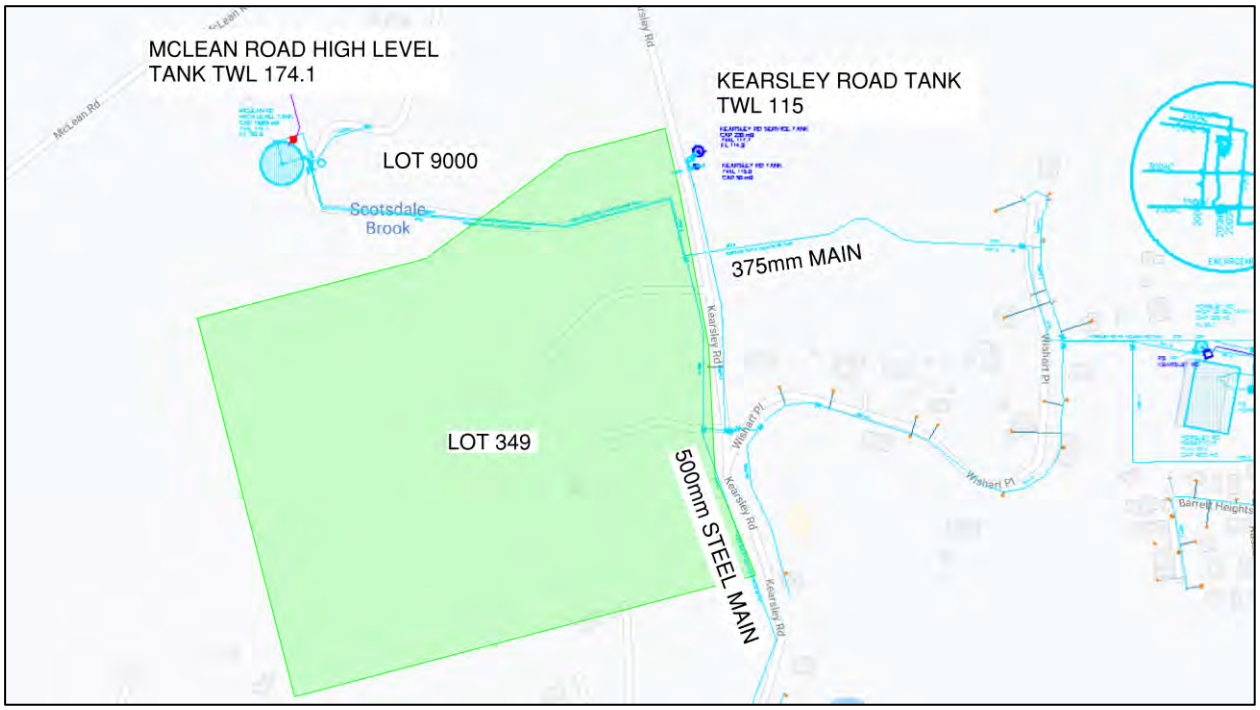


Figure 11 – Existing Water Supply Services (Water Corporation)

Subject to planning reviews by Water Corporation and confirmation of connection requirements, it is expected that the existing 375mm main could provide reticulated water supplies to the subdivision of Lot 349, as it already does to residential areas further east. The subdivision of Lot 349 would include smaller mains with in the road network, with lot connections throughout.

Water mains within the proposed subdivision are to be designed and constructed according to the Water Corporation specifications with installation funded by the developer. Standard infrastructure contributions will also be included.

9 POWER SUPPLY

There is an existing three-phase high-voltage overhead feeder cable through Lot 350, which becomes an underground cable at Kearsley Road, located approximately 260m south of Lot 349. On the eastern side of Kearsley Road, there is an existing underground HV cable which services existing development in Wishart Place, however this cable has no spare capacity to provide power services to the proposed subdivision of Lots 349 and a portion of Lot 9000.

As indicated by Western Power on the network capacity mapping, there is sufficient power in the vicinity of the development site, however to deliver power to Lots 349 and 9000, an extension of the HV network will be necessary.

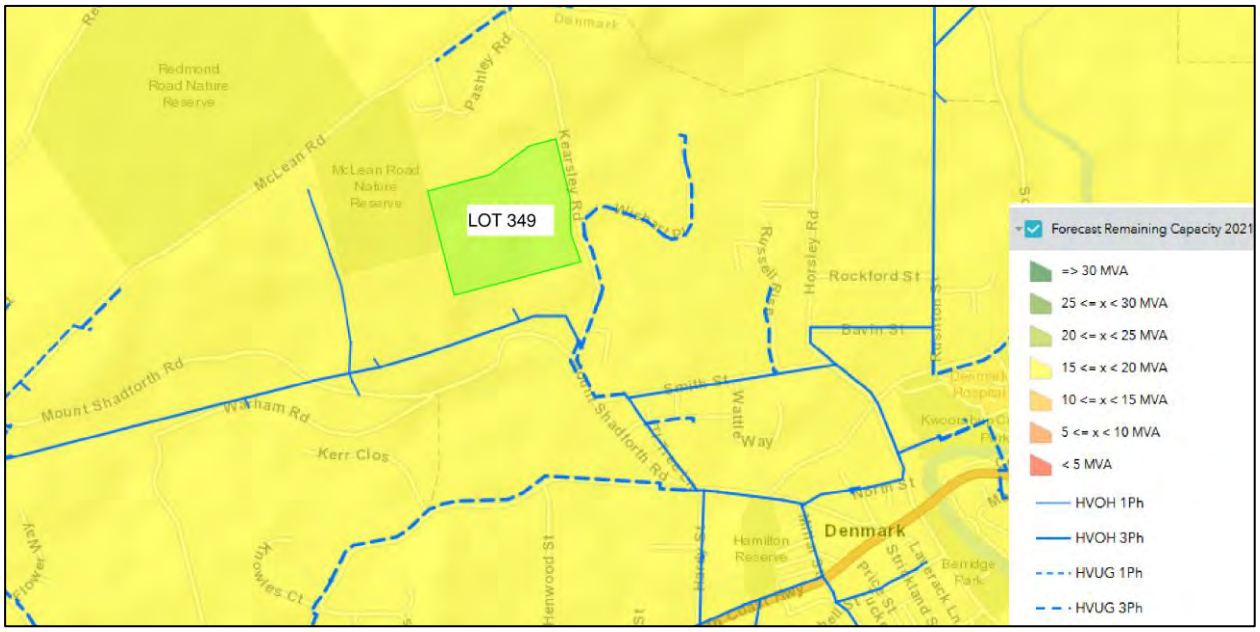


Figure 12 – Western Power Network Capacity Mapping Tool (Western Power)

In order to service the Structure Plan Map, it is proposed that two new 400HV cables be installed on the western side of Kearsley Road, from the same take-off point of the existing underground cable. Therefore, an extension of about 260m to the southern boundary of Lot 349 is required. Given the significant vegetation along Kearsley Road, it is anticipated the majority of these new power services would be installed through trenchless technologies, and drilled to minimise clearing requirements.

The subdivision would be serviced with a switchgear and transformer. Land area up to approximately 50m2 may be required as extensions of the road reserve to accommodate these.

Power and street lighting within the subdivision would be delivered through 240LV extensions, with underground pillar connections made at the road boundary of each lot.

The effects of earth potential rise (EPR) issues will require investigation with site testing and earth resistivity assessments. This will be particularly important in relation to the existing 500mm steel water main, which is parallel to the proposed additional two new HV cables and shall be investigated.

Confirmation of Western Power servicing of the development is subject to a formal request being lodged. A Design Information Package (DIP) will be requested in order to commence that process.

10 COMMUNICATIONS

The proposed subdivision falls within NBN's fixed wireless footprint, indicating NBN Co would be the infrastructure provider of last resort for broadband internet, however it is possible that Telstra may be relied upon for telephone communications.

It is expected NBN Co will extend its fixed line footprint to cover the proposed development providing Fibre to the Premises (FTTP) infrastructure. This will be resolved when a Developer Agreement application is submitted to NBN Co for detailed assessment.

Therefore, the developer will be responsible for the installation of a fibre-ready pit and pipe system which is suitable and compliant with the NBN Co policy and design requirements. This has recently become a WAPC subdivision condition and would be expected to apply to Lots 349 and 9000 Kearsley Road. As shown in Figure 13 below, NBN services are available in Denmark and the surrounding areas to the site.

NBN Co levy two infrastructure charges, a Deployment Charge of $600/dwelling for single residential services and often, a backhaul charge where there is insufficient infrastructure. Backhaul charges are not anticipated, though would be confirmed one an application for a Developer Agreement is made.

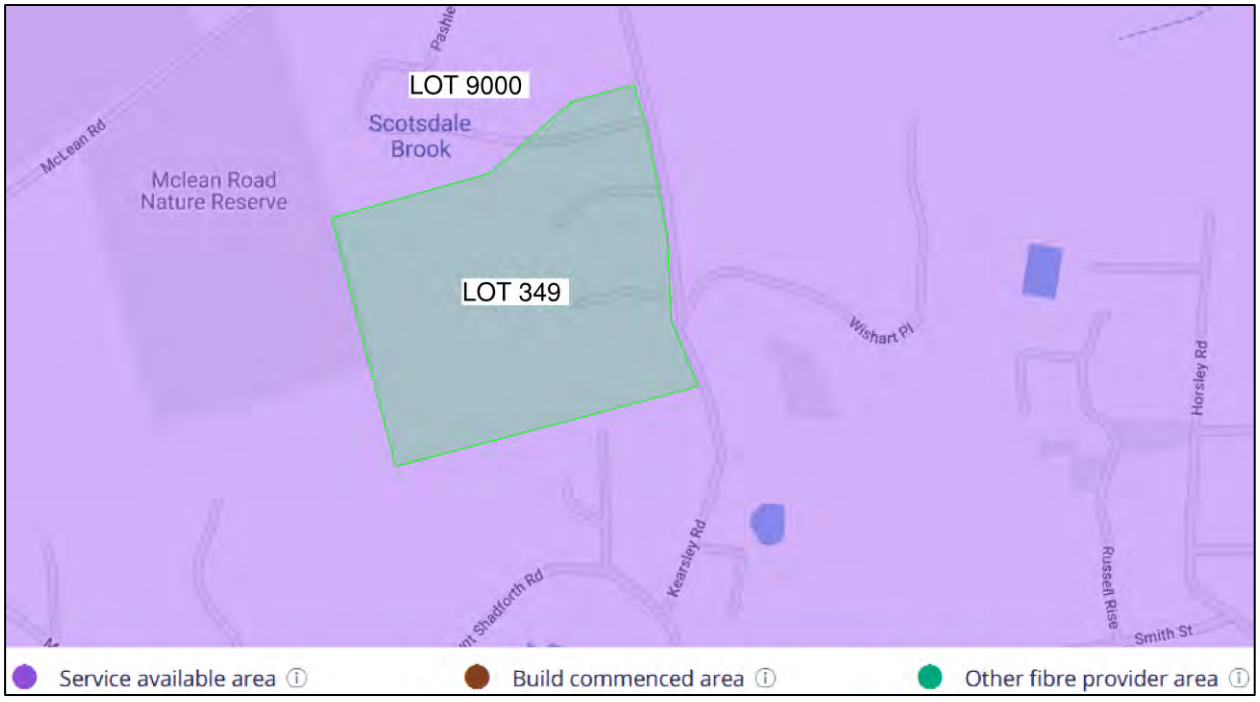


Figure 13 – NBN Rollout Map for Denmark (NBN website)

11 CONCLUSION

Notwithstanding various servicing proposals are required to be resolved in further detail and negotiated with each Authority, from the available desktop data, there does not appear to be engineering related constraints preventing development of Lots 349 and a portion of Lot 9000.

To be resolved in further details, the ultimate drainage overland flow-path for offsite discharge during a major storm event will need to be negotiated with downstream land owners and to the satisfaction of Shire of Denmark. The capacity for downstream sewer will need to be confirmed and protection requirements for Water Corporation's major trunk mains.

Following the submission of the Local Structure Plan, subdivision approval will be sought from the Western Australian Planning Commission. Formal detailed engineering design and approvals will be completed in order to satisfy the subdivision conditions that are anticipated to be issued.

As this report is based on the preliminary servicing advice and investigations completed to date, it is recommended that each Authority be kept informed as the planning progresses and concept engineering designs are refined. Communicating the proposed time-frames for the staged development is also important to inform and coordinate designs and approvals from all relevant Authorities.

12 REFERENCES

- Denmark Surveying and Mapping, 1.0m Interval Contour Plan. Ref 1219-04A. April 2015
- Hyd2o, Lot 349 Kearsley Road, Denmark Hydrological Study. Ref: H20096Av1. January 2021
- MNG Access, online map viewer. February 2021
- NBN Rollout Map, online Map Viewer. February 2021
- PhotoMaps by Nearmap, online Map Viewer. February 2021
- Shire of Denmark Guidelines for Development and Subdivision of Land, Infrastructure Services. Revision 1 May 2011.
- TABEC, Kearsley Road, Denmark. Surface Elevation Plan. 2341-SK-03 Revision A. February 2021
- TABEC, Kearsley Road, Denmark. Road Grade Plan. 2341-SK-04 Revision A. February 2021
- TABEC, Kearsley Road, Denmark. Road 01 Profile. 2341-SK-05 Revision A. February 2021
- UPD, Denmark – power and comms enquiry, emails. 11 February 2021
- WAPC, Liveable Neighbourhoods, Draft. 2015
- Williams Consulting, Structure Plan Map, Lot 349 and a portion of Lot 9000 Kearsley Road, Denmark, WA. February 2021
- Water Corporation, planning and infrastructure mapping. February 2021
- Water Corporation, Denmark - Servicing Enquiry, emails. 06 August 2020
- Western Power, Network Capacity Mapping Tool. February 2021

Appendix G- Stormwater Modelling

8 January 2021

Your Ref:
Our Ref: H20096Av1

TABEC
14 Wickham Street
East Perth WA 6004
Attention: Jonathan Small

Dear Jonathan,

LOT 349 KEARSLEY RD DENMARK HYDROLOGICAL STUDY

As requested, please find below Hyd2o's report detailing stormwater modelling conducted for the proposed development of Lot 349 Kearsley Rd Denmark (herein referred to as the site).

This report provides an assessment of the existing surface water hydrology of the site and based on modelling outcomes provides recommendations for post development stormwater management.

1. BACKGROUND

The proposed development of the site is shown in Figure 1 and comprises a residential development of approximately 50 lots, with sizes ranging from 1200 m^2 to 8000 m^2, together with a proposed road network connecting to the northern end of bitumised section of Kearsley Rd.

The total site is approximately 12.3 ha in area, and is part of a greater topographic catchment area of approximately 31.3 ha (Figure 1). The catchment is relatively steep with the highest point of the catchment area at 180 mAHD in the northwest, falling to 68 mAHD in the southeastern corner.

The catchment area contains no defined watercourses and flow would currently occur as diffuse overland flow across neighbouring properties.

At the wider scale, the site is located within the catchment of the unnamed watercourse which crosses Mt Shadforth Rd approximately 700m south of the site (Figure 1).

Stormwater drainage infrastructure details as provided by the Shire of Denmark for Kearsley Rd are shown in Figure 1. Piped drainage is discontinuous, with part of the road currently draining via an easement to a stormwater management area which appears to be in private property. Pipes sizes in Kearsley Rd range in size from 200mm to 375mm, and based on council advice (Geoff Cole, pers comm), the system is known to be currently under capacity for its existing flows.

From this perspective, any constructed outflow from the site is therefore likely to require an upgraded flow path to enable the safe passage of flow to the creek crossing Mt Shadforth Rd or to the existing storage in Kearsley Rd.

2. EXISTING CATCHMENT FLOW ESTIMATION

The contributing catchment area to Kearsley Rd from the site is 31.3 ha, of which 18.1 ha is currently forested and approximately 13.2 ha is rural.

To estimate the pre-development flow rates from the site Hyd2o utilised a range of various methods including the Australian Rainfall and Runoff (AR&R 2016) Regional Flood Frequency (RFFE) methods, previous Australian Rainfall and Runoff (AR&R 1987) Rational and Flood Index Methods, and an XP-Storm model.

Hyd2o estimated peak flows for a range of storm events up to the 1% Annual Exceedance Probability (AEP, %) event based on applying the various methodologies are summarised in Table 1. Detailed model outputs are contained in Attachments A & B.

The results indicate a wide degree of variability in the estimates, however estimates provided via the Rational Method and XP-Storm are broadly comparable. In relation to the RFFE estimate, a review of its outputs shows the nearby gauging station catchment area and flow relationships indicate the RFFE estimate for the 1% AEP event is likely to be overestimated.

On this basis, the adopted predevelopment flows for design are summarised in Table 1 based on XP-Storm modelling results.

Table 1: Pre Development Flow Estimates Used Various Methods

	Flow Estimate (m3/s) for Various Events	
Flow Estimate Method	20% AEP	1% AEP
AR&R 2016 RFFE Method	0.32	2.04
AR&R 1987 Rational	0.23	0.75
AR&R 1987 Index Flood	0.18	0.38
XP Storm Modelling	0.35	0.78
Adopted Flows for Design /Post Development Modelling	0.35	0.78

3. POST DEVELOPMENT STORMWATER MODELLING

The proposed post development stormwater management area was modelled using XP-Storm, an industry standard program that performs detailed hydraulic and hydrological calculations to simulate the performance of stormwater systems for a range of design storm events.

The design storms modelled by XP-Storm were based on Australian Rainfall & Runoff (AR&R) (Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, 2016)

and the Bureau of Meteorology Computerised Design Intensity Frequency Duration (IFD) Rainfall System.

Storms modelled included the 15mm 1 hr event, 20% AEP event, and the 1% AEP event (100 year Average Recurrence Interval event).

Modelled post development landuse is shown in Figure 2, with the area breakdown shown in Table 2. Runoff rates for rural and forested areas were adopted as per predevelopment modelling, with Hyd2o's CURVV runoff rate calculator (Attachment C) used to estimate post-development runoff rates from the road network and lots. Adopted runoff rates are shown in Table 2, with lots assumed to provide 15 mm retention on site consistent with typical Department of Water and Environmental Regulation (DWER) requirements. Larger events were assumed to flow from lots to the road drainage network.

Key elements of the stormwater management area and approach which aims to manage both stormwater quantity and quality includes the following:

- Maintenance of the existing surface water flow paths and catchments consistent with predevelopment.
- Use of filter media and vegetation within the storage to treat minor events (15 mm).
- Use of shallow batters (1:6) to permit landscaping and provide retention of the major storm events (up to the 1% AEP).
- Discharge to the receiving environment at pre development flow rates.

Modelling results are shown in Table 2 and summarised on Figure 2, showing the extent of inundation for major event flood management.

The total area required for flood storage for management of events up to the 1% AEP event is approximately 2610 m^2, with a total detention storage volume of approximately 2250 m^3. This equates to approximately 2.1% of the site area.

Note that storage shape shown in Figure 2 is indicative only to show the area requirement approximately to scale. The final flood attenuation area configuration, location and elevation will be documented as part of future planning and engineering and will be dependent on final earthworks, drainage, and road design levels for the development.

With respect to the storage outlet, this has been designed to accommodate an outflow consistent with the predevelopment flow rate from the site. To achieve this a low level outlet of approximately 525 mm diameter will be required.

Due to the lack of capacity in the downstream system on Kearsley Rd as previously detailed in Section 2, this outlet will require an upgraded flow path to enable safe passage to the creek crossing Mt Shadforth Rd or to the existing storage in Kearsley Rd.

It is recommended this design be undertaken as part of civil design works in consultation with the Shire of Denmark.

Table 2: XP Storm Post Development Stormwater Modelling

Parameter	Value
Residential: Smaller Lots (ha) (15mm: 0% RO, 20% AEP: 27%, 1% AEP: 56%)	6.3
Residential: Larger Lots (ha) (15mm: 0% RO, 20% AEP: 8%, 1% AEP: 29%)	3.4
Road Reserve (ha) (15mm: 62% RO, 20% AEP: 69%, 1% AEP: 81%)	4.8
Rural (ha) (All Events : 50% RO)	10.9
Forest (ha) (All Events : 20% RO)	5.9
Total Catchment Area (ha)	31.3
Equivalent Impervious Area (EIA) (ha) & Overall Runoff (%) 15 mm 20% AEP 1% AEP	 9.6 (31%) 11.9 (38%) 15.0 (48%)
Design Parameters	
Outlet Diameter (mm)	525
Storage Base Area (m^2)	1400
Side Slopes (v:h)	1:6
15mm Event	
Volume (m^3)	330
Flood Rise above Invert (m)	0.22
Top Water Level Surface Area (m^2)	1600
Discharge Rate (m^3/s)	0.22
20% AEP Event	
Volume (m^3)	585
Flood Rise above Invert (m)	0.37
Top Water Level Surface Area (m^2)	1755
Discharge Rate (m^3/s)	0.42
1% AEP Event	
Volume (m^3)	2250
Flood Rise above Invert (m)	1.14
Top Water Level Surface Area (m^2)	2610
Discharge Rate (m^3/s)	0.74

4. REFERENCES

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (2016) Australian Rainfall and Runoff: A Guide to Flood Estimation.

Chow, V.T. (1959) Open Channel Hydraulics

Engineers Australia (1987) Australian Rainfall and Runoff – A Guide to Flood Estimation Volumes 1&2

Western Australian Planning Commission (2008), Better Urban Water Management

Should you have any queries regarding this report, please do not hesitate to contact Sasha Martens of this office.

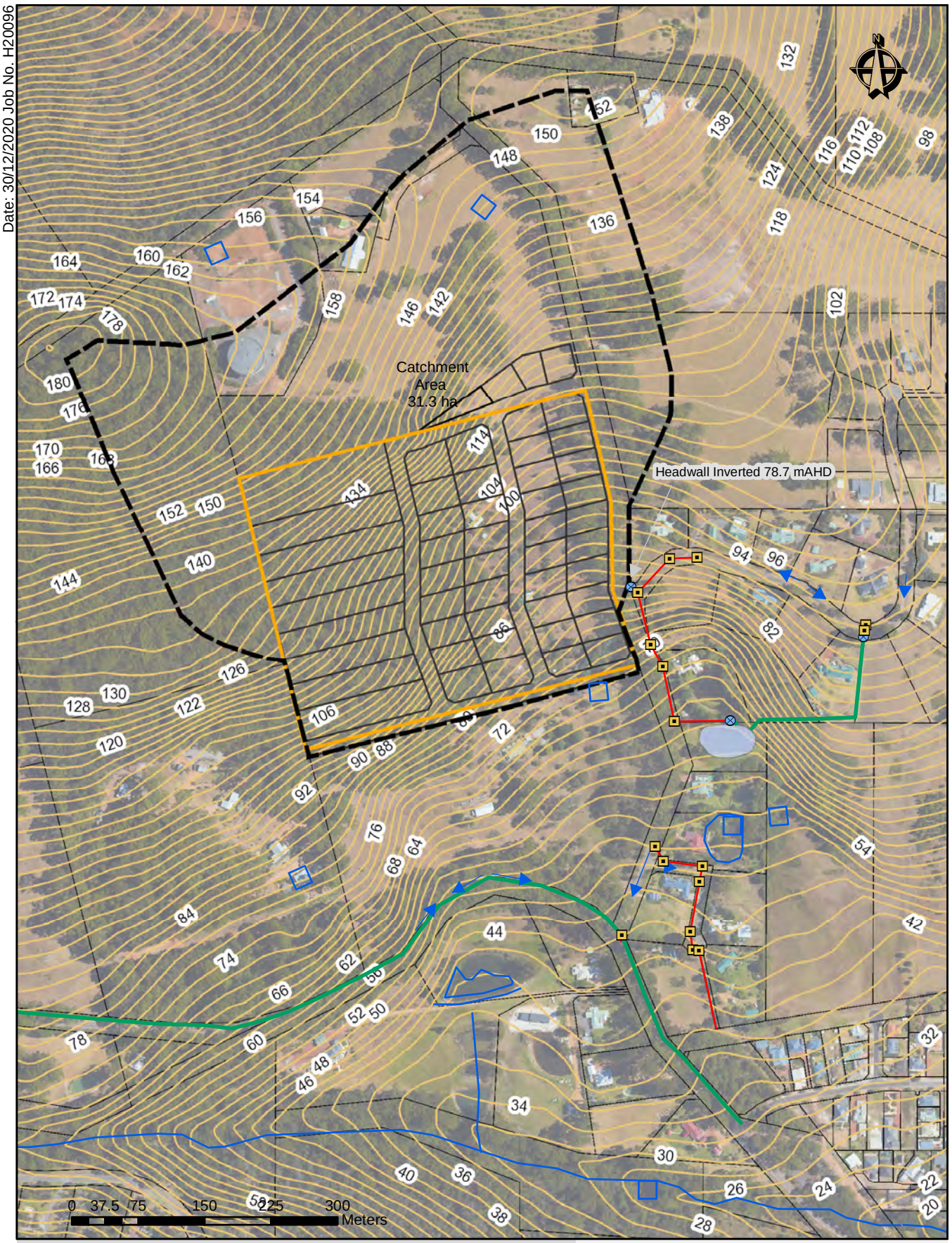
Yours sincerely,

Sasha Martens, Principal Engineering Hydrologist

FIGURES

ATTACHMENTS

Date: 30/12/2020 Job No. H20096



Site Boundary
Catchment
Proposed Subdivision Cadastre
DWER Hydrography
Landgate 2 metre contours

Manhole
Headwall
Pipe
Open Drain
Stormwater Flow
Drainage Area

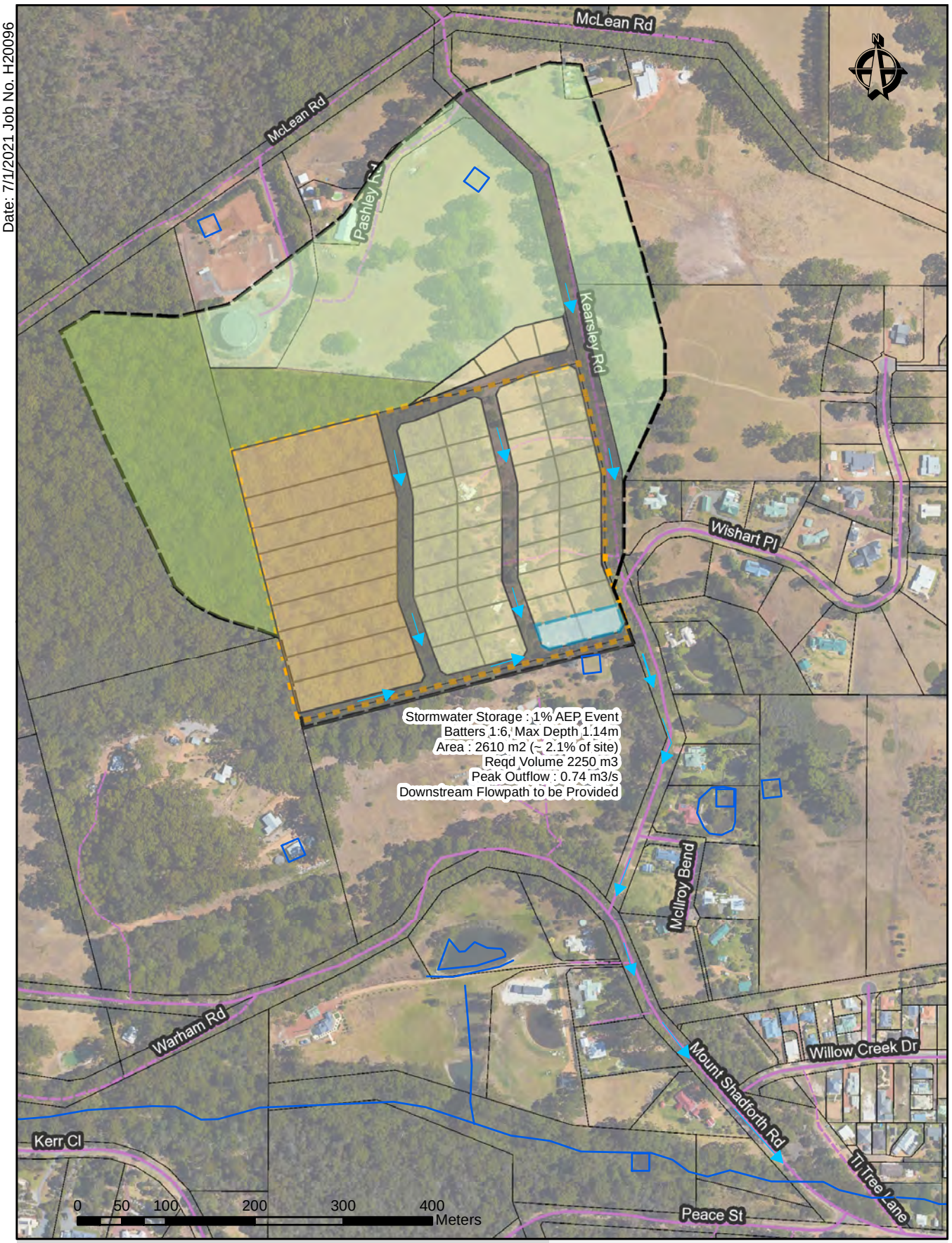
hyd2o

Kearsley Rd Denmark Hydrological Study

Catchment & Infrastructure Plan

Figure 1

Date: 7/1/2021 Job No. H20096



Site Boundary
Post Development Catchment
DWER Hydrography
1% AEP Storage Area

External Forest
External Rural
Large Lots
Road Reserve
Small Lots

hyd2o

Kearsley Rd Denmark Hydrological Study

Stormwater Management Plan

Figure 2

Regional Flood Frequency Estimation Model

Release Version of the Regional Flood Frequency Estimation Model for the 4th edition of Australian Rainfall and Runoff.

Australian Rainfall & Runoff

Input Data

Basic | Advanced

Catchment Name

Kearsley Rd Denmark

Catchment Outlet Latitude

-34.952

Catchment Outlet Longitude

117.3453

Catchment Centroid Latitude

-34.9505

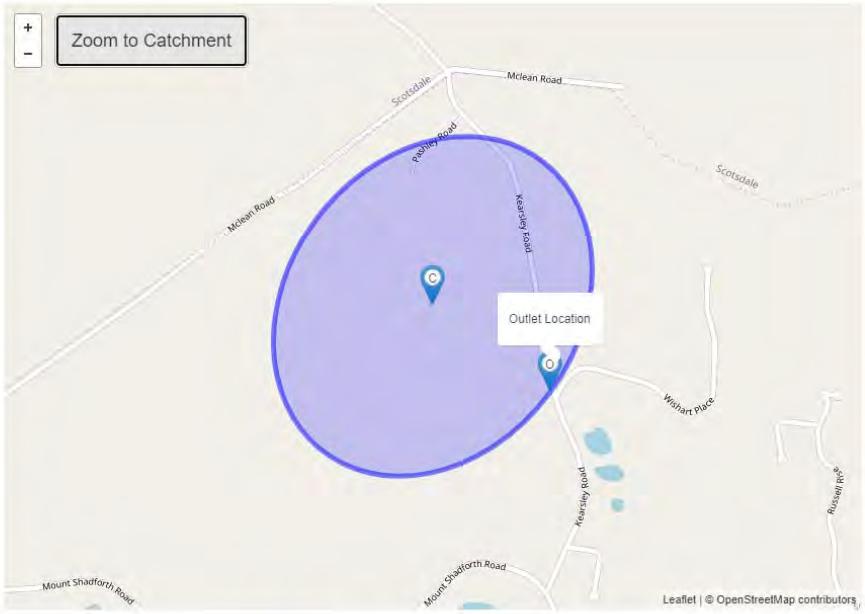
Catchment Centroid Longitude

117.3428

Catchment Area (km²)

0.313

Submit

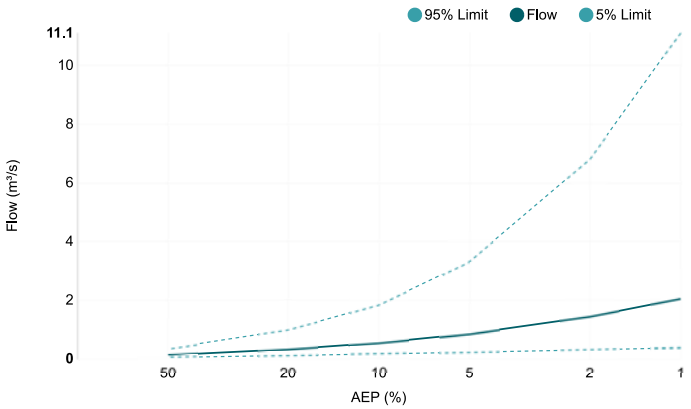


Method by Dr Ataur Rahman and Dr Khaled Haddad from Western Sydney University for the Australian Rainfall and Runoff Project. Full description of the project can be found at the project page on the ARR website. Send any questions regarding the method or project here.

ENGINEERS AUSTRALIA

WESTERN SYDNEY UNIVERSITY

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.

*The catchment has unusual shape. 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	0.120	0.0400	0.350
20	0.320	0.110	0.980
10	0.540	0.160	1.84
5	0.850	0.220	3.32
2	1.43	0.300	6.79
1	2.04	0.370	11.1

Statistics

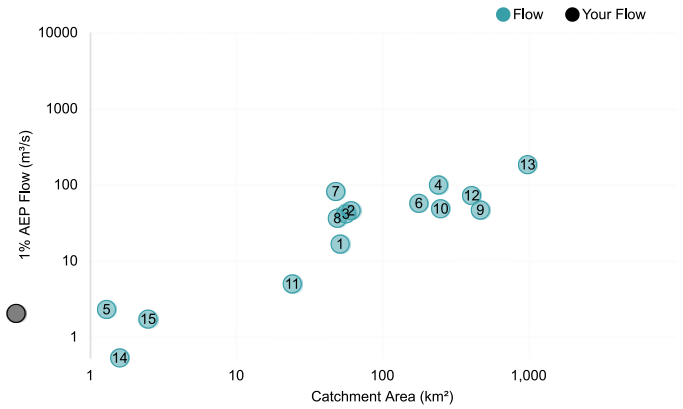
Variable	Value	Standard Dev
Mean	-2.202	0.834
Standard Dev	1.336	0.465
Skew	0.112	0.092

Note: These statistics come from the nearest gauged catchment. Details.

Correlation		
1.000		
-0.280	1.000	
-0.050	-0.070	1.000

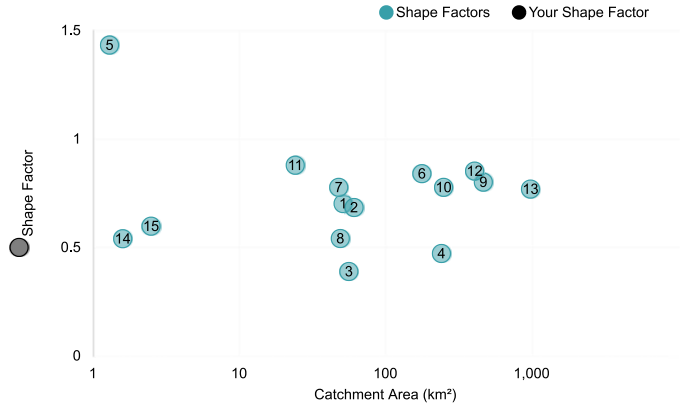
Note: These statistics are common to each region. Details.

1% AEP Flow vs Catchment Area

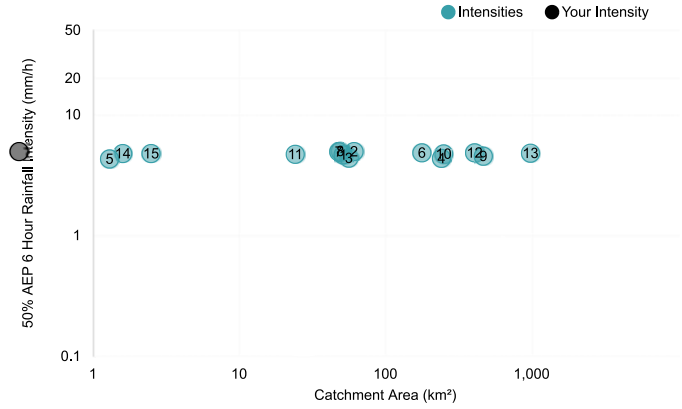


Shape Factor vs Catchment Area

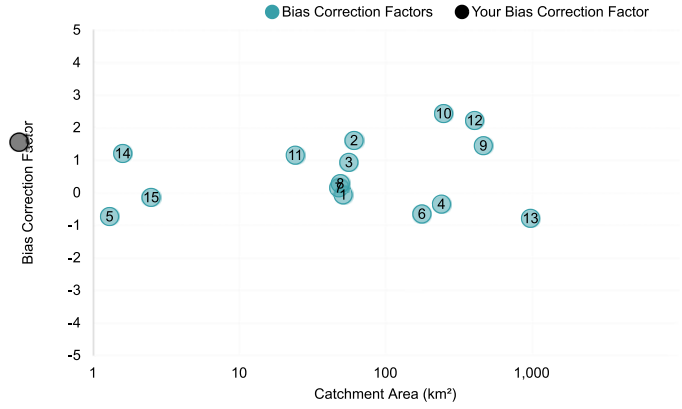
Note: This region does not use shape factors



Intensity vs Catchment Area



Bias Correction Factor vs Catchment Area



Download

TXT Nearby JSON

Input Data

Date/Time	2021-01-07 20:09
Catchment Name	Kearsley Rd Denmark
Latitude (Outlet)	-34.952
Longitude (Outlet)	117.3453

Input Data	
Latitude (Centroid)	-34.9505
Longitude (Centroid)	117.3428
Catchment Area (km^2)	0.313*
Distance to Nearest Gauged Catchment (km)	14.17
50% AEP 6 Hour Rainfall Intensity (mm/h)	4.951491
2% AEP 6 Hour Rainfall Intensity (mm/h)	10.684031
Rainfall Intensity Source (User/Auto)	Auto
Region	SW WA
Region Version	RFFE Model 2016 v1
Region Source (User/Auto)	Auto
Shape Factor	0.5*
Interpolation Method	Natural Neighbour
Bias Correction Value	1.552

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 (http://www.engineersaustralia.org.au)

WESTERN SYDNEY UNIVERSITY (http://www.uws.edu.au)

AR&R 1987 Peak Flow Calculator

SOUTH WEST REGION

hyd2o HYDROLOGY

Catchment name	Denmark
Catchment type	Jarrah forest with lateritic soils

RATIONAL METHOD

Catchment area	0.31	km^2
Mainstream length	0.7	km
Slope	150.0	m/km
Catchment cleared	42.0	%

C_{10} =	0.144		C10=3.12*10-2 *100.0043CL*(LSe)^0.2
t_c =	74.0	mins	$tc=2.31A^{0.54}$
	1.23	hours	

$Q_y = 0.278\ C_{10}*(C_y/C_{10})\ I_{tc}\ A$

ARI (yrs)	2	5	10	20	50	100	
C_y/C_{10}	0.74	0.88	1.00	1.13	1.28	extrapolate	
I_{tc} values	17.01	21.19	24.02	27.92	33.57		mm/hr
Q =	0.16	0.23	0.30	0.40	0.54	0.75	m^3/s

INDEX FLOOD METHOD

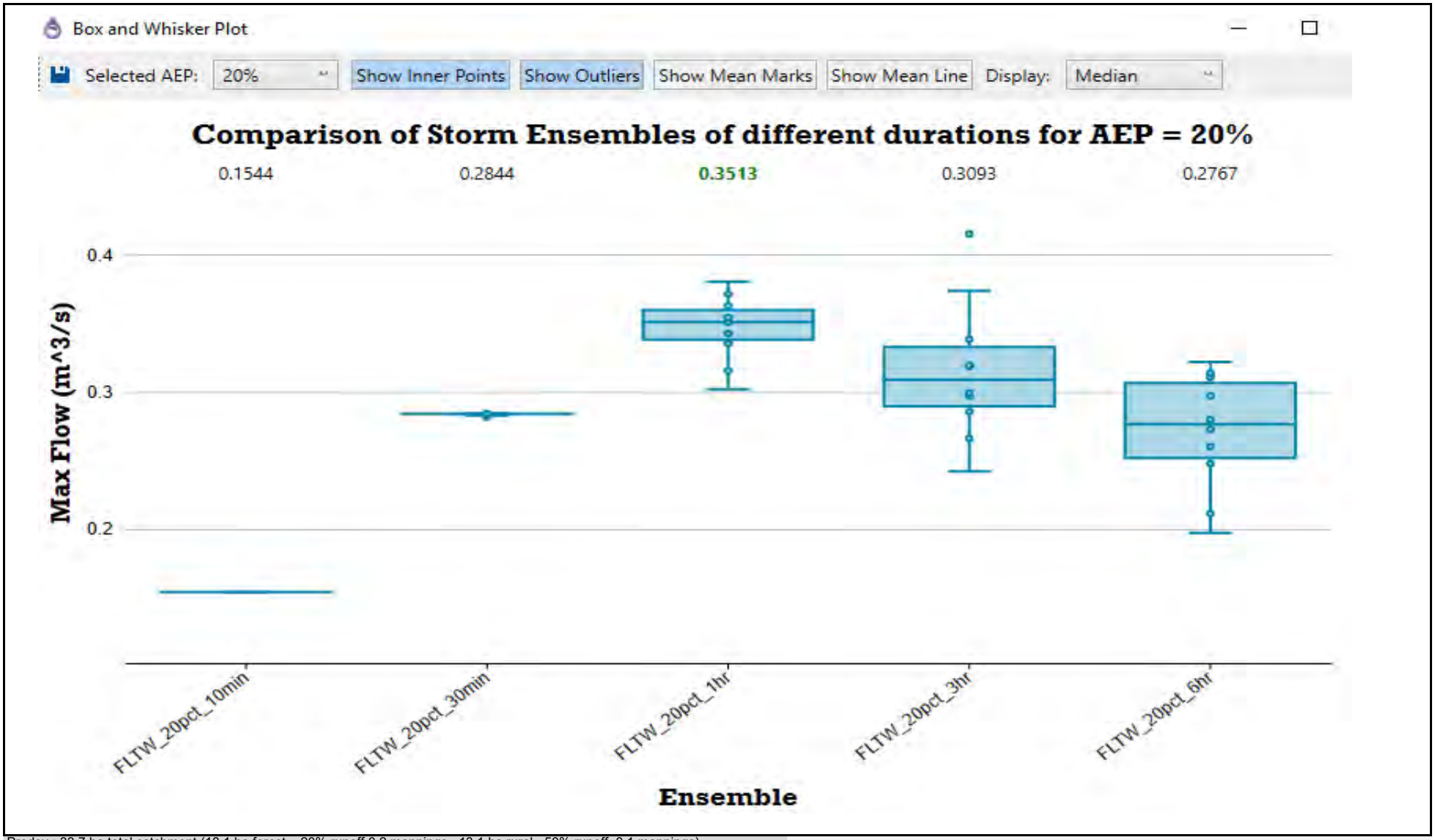
Catchment area	0.31	km^2
Annual rainfall	1040.0	mm
Slope	150.0	m/km
Mainstream length	0.7	km
Catchment cleared	42.0	%

Q2 =	0.120	Q2 = 8.22*10-9 A0.73 P 2.22 (LSe)0.28 100.0064CL

$Q_y = Q_2*(Q_y/Q_2)$

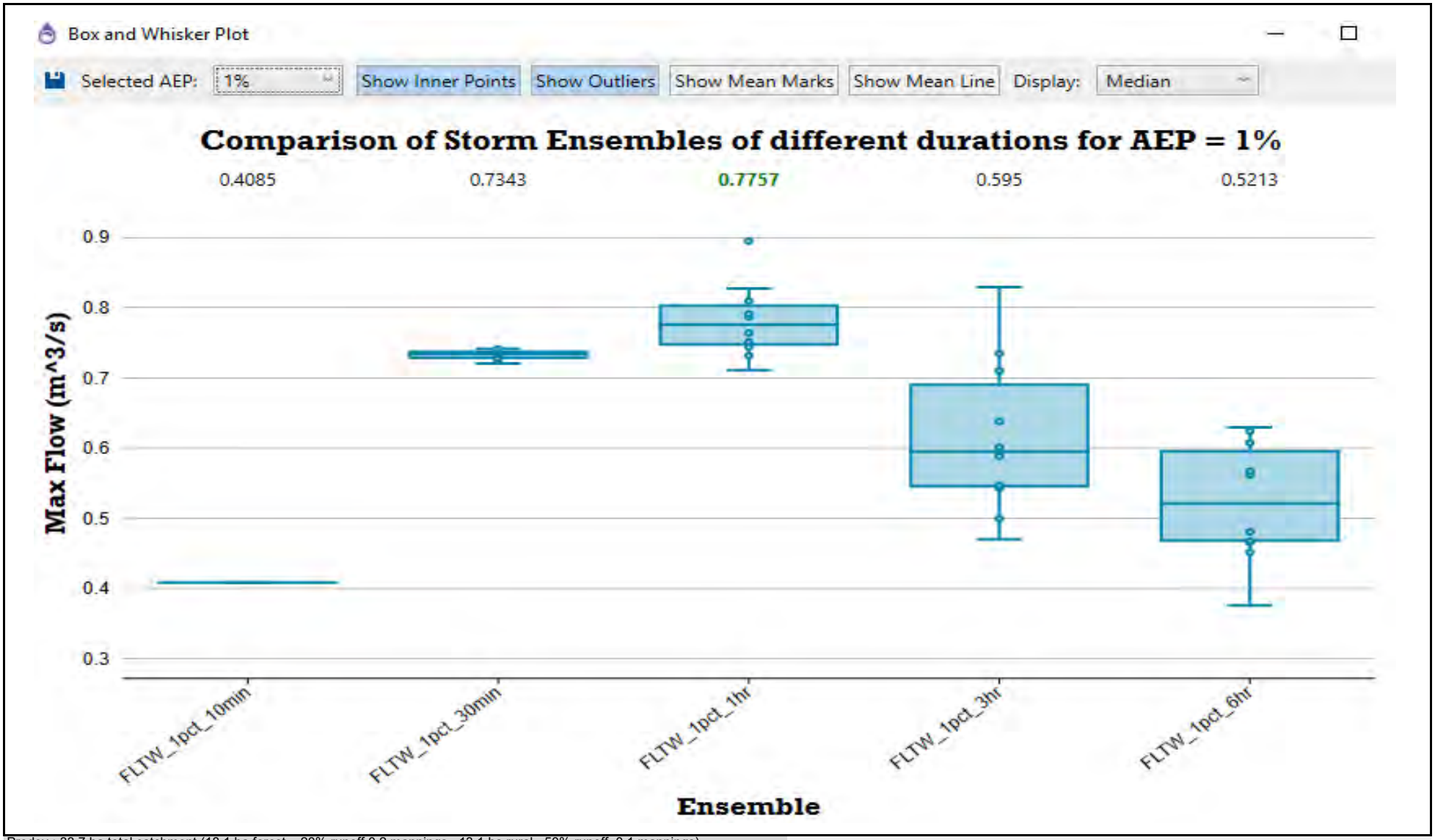
ARI (yrs)	2	5	10	20	50	
(Q_y/Q_2)	1.00	1.47	1.91	2.41	3.20	
Q =	0.12	0.18	0.23	0.29	0.38	m^3/s

Date: 7/1/2020 Job No H20096



Predev : 33.7 ha total catchment (18.1 ha forest – 20% runoff 0.2 mannings, 13.1 ha rural - 50% runoff, 0.1 mannings)

Date: 7/1/2020 Job No H20096



Predev : 33.7 ha total catchment (18.1 ha forest – 20% runoff 0.2 mannings, 13.1 ha rural - 50% runoff, 0.1 mannings)

ATTACHMENT C
CURRV Post Development Runoff Rate Calculator

CURRV

Calculator for Urban Runoff Rates & Volumes
8/01/2021

Project: Post Dev Runoff Kearsley Rd Denmark

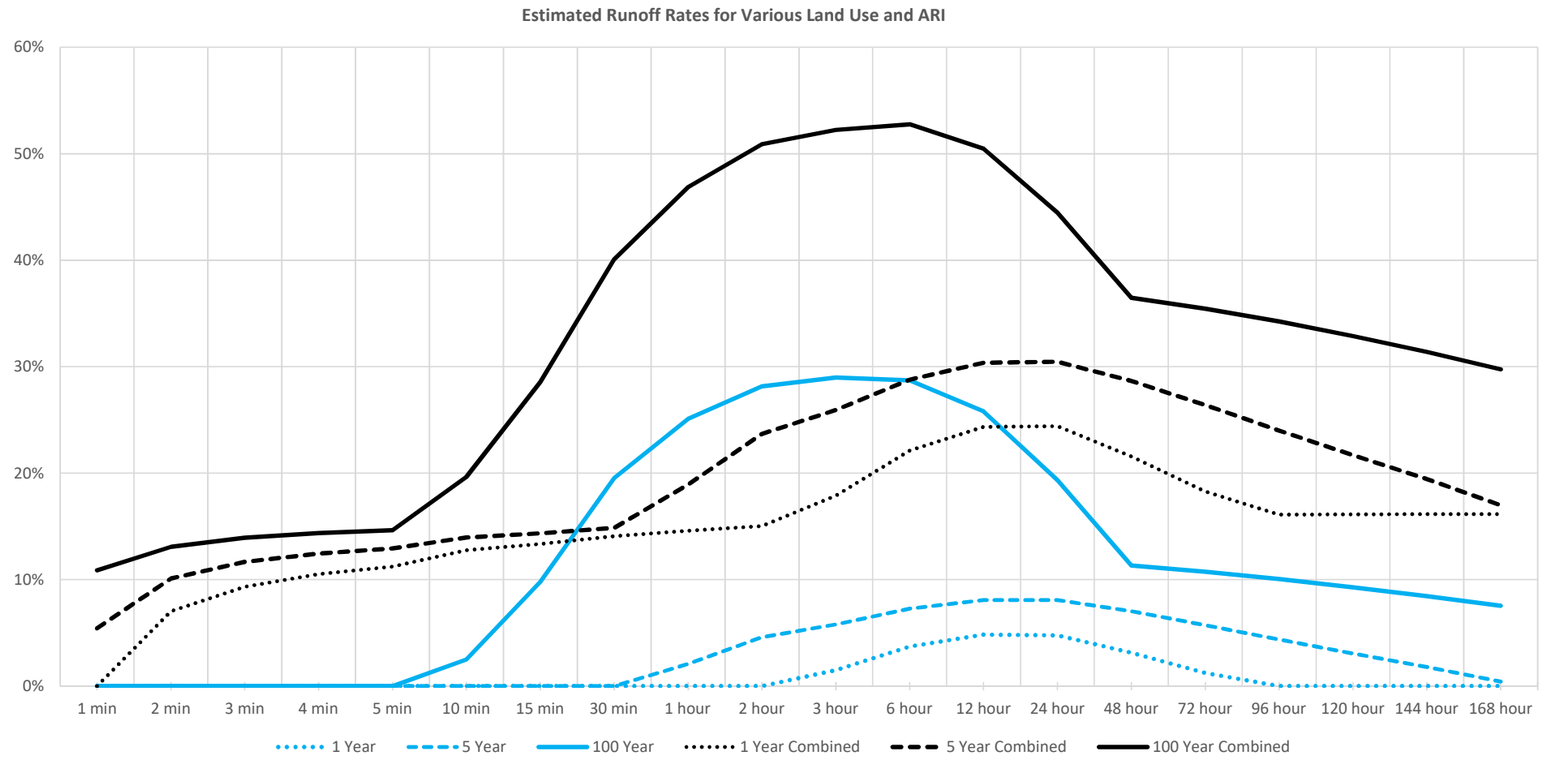
	Land Use Description	Area (ha)	Use in Calc	Imperv Initial Loss mm	Perv Initial Loss mm	Perv Continue Loss mm/hr	On Site Soak (mm)	AR&R Empty (days)	EIA/TIA System Connect Ratio	Roof %	Ext Imp %	Ext Perv %	Comment
1	Small Lots	6.31	Yes	1.5	20.0	4.0	15.0	1.00	100%	25	25	50	Assume runoff in excess of soakwells to system
2	Road Reserve	3.40	Yes	1.5	20.0	4.0	0.0	1.00	100%	0	70	30	Runoff to stormwater basin
3	Large Lots	4.77	Yes	1.5	20.0	4.0	15.0	1.00	60%	10	15	75	Assume remain largely forested
4								1.00					
5	External forest and rural areas							1.00					
6	to remain and runoff as per							1.00					
7	predevelopment rates							1.00					
8	(via ARR Regional Runoff Coeff Curves)							1.00					
9								1.00					
10								1.00					

EIA : Effective Impervious Area, TIA : Total Impervious Area

Land Use Graph Selector: **3**

(11 - combined total)

Large Lots



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	1.5	1.67	2.24	2.68	3.15	3.84	4.43
2	2 min	2.62	2.91	3.89	4.63	5.41	6.5	7.32
3	3 min	3.47	3.85	5.16	6.14	7.18	8.65	9.79
4	4 min	4.16	4.61	6.17	7.36	8.62	10.4	11.9
5	5 min	4.73	5.24	7.02	8.38	9.83	11.9	13.7
6	10 min	6.69	7.41	9.95	11.9	14	17.2	19.9
7	15 min	7.96	8.82	11.8	14.2	16.7	20.5	23.8
8	30 min	10.4	11.5	15.5	18.5	21.8	26.6	30.7
9	1 hour	13.4	14.9	19.9	23.6	27.7	33.5	38.3
10	2 hour	17.4	19.3	25.6	30.3	35.2	42.2	47.9
11	3 hour	20.4	22.5	29.9	35.2	40.9	48.8	55.3
12	6 hour	26.9	29.7	39.3	46.3	53.6	64.2	73
13	12 hour	35.4	39.2	52	61.6	71.8	87.1	100
14	24 hour	46.2	51	68.2	81.7	96.5	120	140
15	48 hour	58.7	64.9	87.4	106	127	160	189
16	72 hour	67	73.9	99.4	120	144	183	216
17	96 hour	73.4	80.9	108	130	156	196	232
18	120 hour	79	86.9	115	138	163	204	240
19	144 hour	84.2	92.2	121	143	167	207	244
20	168 hour	89.1	97.3	125	147	170	207	244

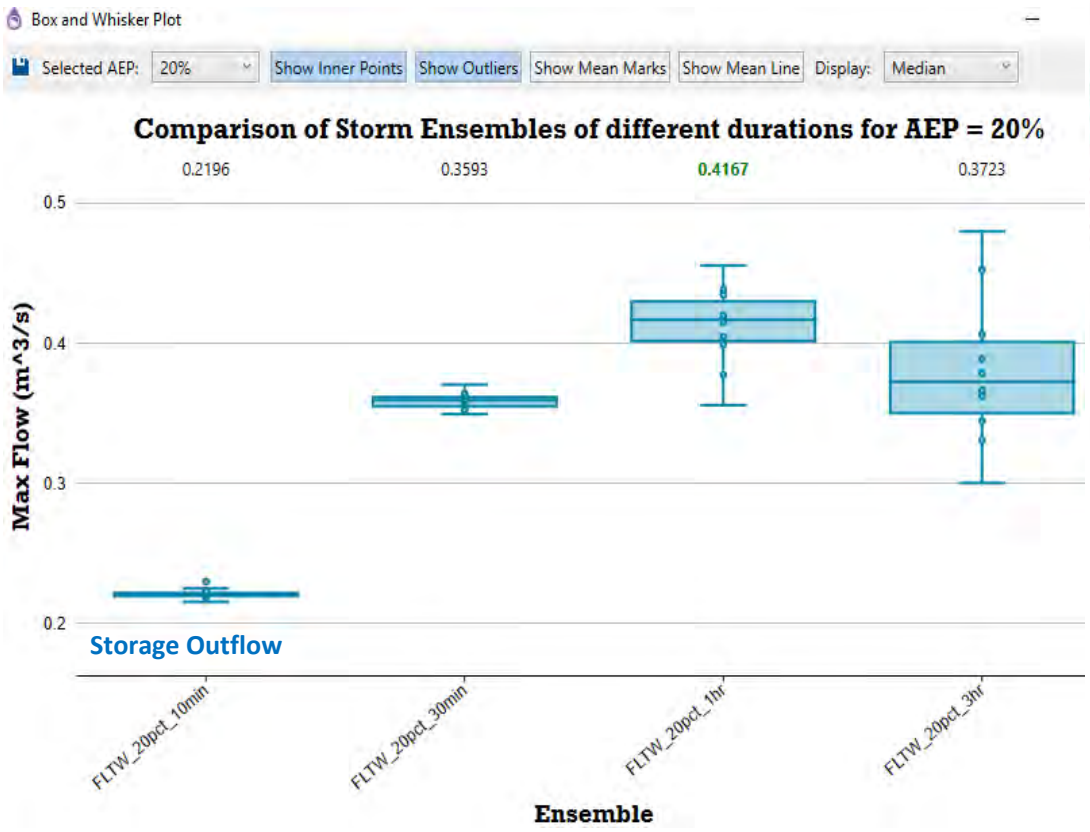
Estimated Runoff Rates

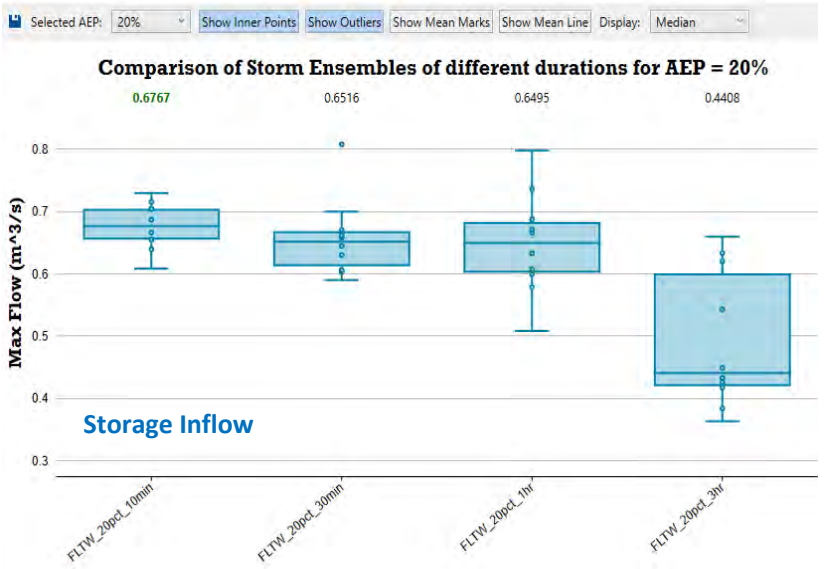
Annual Exceedence Probability

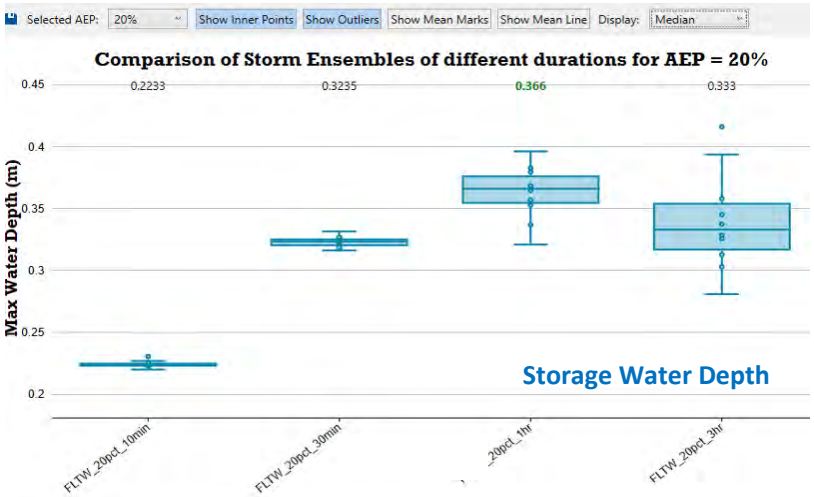
	63.2%	50%	20%	10%	5%	2%	1%
Maximum of All Events	1.00	1.44	4.48	10	20	50	100
Small Lots	**16%**	19%	**27%**	**31%**	40%	50%	**56%**
Road Reserve	**69%**	69%	**69%**	**70%**	74%	78%	**81%**
Large Lots	**5%**	6%	**8%**	**11%**	18%	25%	**29%**
0	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
External forest and rural areas	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
to remain and runoff as per	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
predevelopment rates	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
(via ARR Regional Runoff Coeff Curves)	**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	**24%**	26%	**30%**	**33%**	40%	48%	**53%**

Event Selector	**9**	**1 hour**					
Small Lots	**0%**	0%	**7%**	**14%**	26%	39%	**46%**
Road Reserve	**62%**	63%	**65%**	**66%**	70%	75%	**78%**
Large Lots	**0%**	0%	**2%**	**4%**	12%	20%	**25%**
0	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
External forest and rural areas	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
to remain and runoff as per	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
predevelopment rates	**0%**	0%	**0%**	**0%**	0%	0%	**0%**
(via ARR Regional Runoff Coeff Curves)	**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%**	15%	**19%**	**23%**	32%	41%	**47%**

Date: 7/1/2020 Job No H20096







hyd$_2$o

Kearsley Rd Denmark Hydrological Study

XP- Storm Post Development Modelling Results : 20% AEP

Attachment D1

Date: 7/1/2020 Job No H20096