









# **APPENDIX A**

Indicative Concept Plan



Planning Design Delivery



LEGEND Subject Site Existing Boundaries Proposed Staging Boundaries Indicative 25m Fire Buffer MRS -Parks and Recreation Integrated Wetland / Fire Buffer Future "Parks and Recreation" (Subject to MRS Amendment) Residential Public Open Space\* Drainage\* \*(Indicative locations only)

50 100 Metre

#### REVISIONS

Rev	Date	Drawn	
В	2018.02.19	W. Clements	
С	2018.02.22	A. Glaskin	
D	2018.02.27	W. Clements	
F	2018 03 06	W Clements	



www.rowegroup.com.au info@rowegroup.com.au 08 9221 1991

Date Drawn: Job Ref: Client: Designer: Projection: Plan ID:

2018.02.15 4080 1:2,000 @ A3 Elite Developments Pty Ltd A. Lohman MGA50 GDA94 4080-CON-09-E



# **APPENDIX B**

District Context Plan

Stage 1

Stage 2

500 Metres

W. Clements W. Clements Date 2017.11.13 2018.04.18 2018.04.19 2018.04.20 REVISIONS

ROWEGROUP PLANNING DESIGN DELIVERY

Date Drawr

2017.05.24 4080 1:7,500 (8 A3 Elite Developments (WA) Py Ltd A. Lohman

4080-FIG-14-H

Plan ID:

Lots 11 & 74 Beenyup Road Banjup

BANJUP LAKE SHIRLEY BALLE SWAMP **BUSH FOREVER SITE 263** JANDAKOT REGIONAL PARK **BUSH FOREVER SITE 492** GIBBS ROAD KWINANA FREEWAY STATION (1,200M)



# **APPENDIX C**

Level 2 Flora and Vegetation Survey (2015)



Beenyup Road

Level 2 Flora and Vegetation Survey

Prepared for:

Aigle Royal Developments

February 2016

peopleplanetprofessional

Document	Revision	Prepared by	Reviewed by	Submitted to Client	
Reference				Copies	Date
1269 AB	A INTERNAL DRAFT	NW	RF	1 Electronic (email)	17/12/15
1269 AB	B CLIENT DRAFT	NW	KK	1 Electronic (email)	22/01/16
1269 AB	C FINAL	NW	TS	1 Electronic (email)	02/02/16

#### Disclaimer

This report is issued in accordance with, and is subject to, the terms of the contract between the Client and 360 Environmental Pty Ltd, including, without limitation, the agreed scope of the report. To the extent permitted by law, 360 Environmental Pty Ltd shall not be liable in contract, tort (including, without limitation, negligence) or otherwise for any use of, or reliance on, parts of this report without taking into account the report in its entirety and all previous and subsequent reports. 360 Environmental Pty Ltd considers the contents of this report to be current as at the date it was produced. This report, including each opinion, conclusion and recommendation it contains, should be considered in the context of the report as a whole. The opinions, conclusions and recommendations in this report are limited by its agreed scope. More extensive, or different, investigation, sampling and testing may have produced different results and therefore different opinions, conclusions and recommendations. Subject to the terms of the contract between the Client and 360 Environmental Pty Ltd, copying, reproducing, disclosing or disseminating parts of this report is prohibited (except to the extent required by law) unless the report is produced in its entirety including this cover page, without the prior written consent of 360 Environmental Pty Ltd.

© Copyright 2016 360 Environmental Pty Ltd ACN 109 499 041



### **Executive Summary**

360 Environmental was commissioned by Aigle Royal Developments (ARD) to conduct a Level 2 flora and vegetation survey at Lots 11 and 74 Beenyup Road in Banjup (Survey Area). The Survey Area is approximately 41.1 ha in size and is located approximately 22 km south of Perth Central Business District (CBD), in the Swan Coastal Plain (SCP) biogeographic region of WA.

A total of 145 taxa (including species, subspecies, varieties and forms) from 101 genera and 45 families were recorded in the Survey Area. The commonly occurring families were; Myrtaceae (18 taxa), Fabaceae (15 taxa) and Orchidaceae (13 taxa).

Portions of the Survey Area have been completely cleared for residential and a nursery, while other areas have been allowed to regenerate naturally and some sections have had endemic and non-endemic species planted. There is also a large proportion of the site that is original native vegetation.

A total of 27 introduced species were recorded during the survey (Table 6). Two species, \*Asparagus asparagoides and \*Zantedeschia aethiopica, are listed as Declared under the BAM Act. One species \*Asparagus asparagoides is listed as a Weed of National Significance (WONS).

The database searches identified 24 conservation significant flora as potentially occurring in the vicinity of the Survey Area. Of these, nine are classed as Threatened, one as Priority 1, eight as Priority 3 and six as Priority 4.

No Threatened flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* or gazetted as Declared Rare Flora (Threatened) pursuant to the Wildlife Conservation Act were recorded during the survey. No Priority species were found during the survey.

Vegetation condition ranged from Completely Degraded to Excellent. Historical vegetation clearing, weeds, housing, a nursery and the presence of tracks in the Survey Area were the most frequently observed impacts on native vegetation.

Two Priority 3 vegetation communities, SCP21c - Low lying *Banksia attenuata* woodlands or shrublands and SCP22 – *Banksia ilicifolia* woodlands, are known to occur in close proximity to the Survey Area with their buffers encroaching into the north east corner of the Survey Areas boundary.

One listed Priority 3 vegetation community from the database search was identified as occurring in the Survey Area. Vegetation associations BaBm (b) and BiKg are thought to represent FCT SCP 21c – Low lying *Banksia attenuata* woodlands or shrublands.

The vegetation association BaBm (a), has been identified as FCT SCP23a - Central Banksia attenuata – B. menziesii woodlands. Although the database search did not identify SCP23a, it is included in the PEC "Banksia dominated woodlands of the Swan Coastal Plain IBRA region", which is now listed as a Priority 3.



The entire Survey Area is identified as an Environmentally Sensitive area (ESA). Although there is no publicly available information detailing the reasoning behind the ESA mapping, the boundaries are found to correlate with the Gibbs Road Swamp System according to the Directory of Important Wetlands.

The DPaW Geomorphic Wetlands Dataset identifies one Conservation Category Wetland (CCW) and one Resource Enhancement Wetland (REW) as occurring in the Survey Area. CCWs and their associated buffers are considered ESAs.

Environmentally Sensitive Areas are declared to prevent degradation of important environmental values such as T/DRF, TECs or significant wetlands. Exemptions contained in the Environmental Protection (Clearing of Native vegetation) Regulations 2004 for low impact land clearing do not apply in ESAs and a clearing permit is required.

#### Permits

This flora survey was conducted under the following licences issued by DPaW; Licence to take flora for scientific or other prescribed purposes SL011541 and Permit to take Declared Rare Flora 44-1516 issued to Narelle Whittington.



## Table of Contents

1	Introduction	1
1.1	The Project	1
1.2	Background to the Protection of Flora and Vegetation	3
2	Biophysical Environment	6
2.1	Climate	6
2.2	Geology and Soils	6
2.3	Hydrology	7
2.4	Bush Forever	8
2.5	Ecological Linkages	8
2.6	Environmentally Sensitive Areas	8
2.7	Biogeographic Regionalisation for Australia	8
2.8	Broad Vegetation Types	9
3	Methods	11
3.1	Background	11
3.2	Flora and Vegetation Survey Methods	11
0	9	
4	Results	
_	· · · · · · · · · · · · · · · · · · ·	13
4	Results	1 <b>3</b>
<b>4</b> 4.1	Results	13 13 14
<b>4</b> 4.1 4.2	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results	13 13 14
<b>4</b> 4.1 4.2 <b>5</b>	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results  Discussion  Flora Context	131429
<b>4</b> 4.1 4.2 <b>5</b> 5.1	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results  Discussion  Flora Context  Flora of Conservation Significance	13142929
<b>4</b> 4.1 4.2 <b>5</b> 5.1 5.2	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance	1314292929
<b>4</b> 4.1 4.2 <b>5</b> 5.1 5.2 5.3	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance  ESAs	131429292929
<b>4</b> 4.1 4.2 <b>5</b> 5.1 5.2 5.3 5.4	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance  ESAs  Vegetation Condition and Introduced Flora	13142929292931
<b>4</b> 4.1 4.2 <b>5</b> 5.1 5.2 5.3 5.4 5.5	Results  Flora and Vegetation Survey Limitations and Constraints  Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance  ESAs  Vegetation Condition and Introduced Flora  Regional Representation	13142929293031
<b>4</b> 4.1 4.2 <b>5</b> 5.1 5.2 5.3 5.4 5.5 5.6	Results  Flora and Vegetation Survey Limitations and Constraints Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance  ESAs  Vegetation Condition and Introduced Flora  Regional Representation  Geomorphic Wetlands	13142929303131
4.1 4.2 5 5.1 5.2 5.3 5.4 5.5 5.6 5.7	Results  Flora and Vegetation Survey Limitations and Constraints Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance  ESAs  Vegetation Condition and Introduced Flora  Regional Representation  Geomorphic Wetlands	1314292930313131
4.1 4.2 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8	Results  Flora and Vegetation Survey Limitations and Constraints Flora Results  Discussion  Flora Context  Flora of Conservation Significance  Vegetation of Conservation Significance  ESAs  Vegetation Condition and Introduced Flora  Regional Representation  Geomorphic Wetlands  Ecological Linkages	131429293031313132



## List of Tables

Table 1: Geomorphic Wetlands in the Survey Area	7
Table 2: Broad Vegetation Types within the Survey Area and its State and Regional Representation (Government of WA 2013).	9
Table 3: Vegetation Complex within the Survey Area and their State and Regional Representation.	10
Table 4: Limitations and Constraints Associated with the Survey	13
Table 5: Assessment of the Likelihood of Occurrence of Significant Flora in the Surv	•
Table 6: Introduced Flora Recorded in the Survey Area and Their Ranking under the DPaW Weed Prioritisation Process (DPaW 2013)	
Table 7: Vegetation Association Descriptions and their Extent in the Survey Area	20
Table 8: Other Mapping Unit Descriptions and their Extent in the Survey Area	21
Table 9: Vegetation Condition and Extent in the Survey Area	22
Table 10: Floristic Community Type Analysis	22
Table 11: Referred Floristic Community Types	27
Table 12: Representation of broad vegetation types and corresponding vegetation associations	28
List of Figures	
Figure 1: Location of the Survey Area	2
Figure 2: Mean Rainfall (from 1944 to 2015) and Temperature Data (from 1944 to 20 for Jandakot Airport Weather Station (009172) (BoM 2015).	
Figure 3: Conservation Areas	38
Figure 4: Environmentally Sensitive Area in the Survey Area	39
Figure 5: DPaW Database results of TEC's, PEC's and DRF	40
Figure 6: Vegetation Associations	41
Figure 7: Vegetation Condition Mapping	42
Figure 8: Historical Photographs	43



## List of Appendices

Appendix A: Definition of Declared Rare / Priority / Threatened Flora & Fauna Specie	<b>?</b> S
	. 44
Appendix B: Definition of Threatened & Priority Ecological Communities	. 48
Appendix C: Environmental Weeds & Declared Plant Categories	. 53
Appendix D: Vegetation Condition Scale	. 55
Appendix E: Flora Inventory	. 57
Appendix F: Flora Survey Area Data Sheets	. 59
Appendix G: Desktop Searches	. 61



### 1 Introduction

### 1.1 The Project

360 Environmental was commissioned by Aigle Royal Developments (ARD) to conduct a Level 2 flora and vegetation survey at Lots 11 and 74 Beenyup Road in Banjup (Survey Area). The Survey Area is approximately 41.1 ha in size and is located about 22 km south of Perth CBD, in the Swan Coastal Plain (SCP) biogeographic region of Western Australia (WA) (Figure 1).

360 Environmental understands from communications with ARD that a flora assessment was previously undertaken in the Survey Area and that this data is not accessible, as such a new survey is required. This flora and vegetation survey is required to support a local structure plan and to undertake wetland assessments and possible boundary changes.

#### 1.1.1 Objectives

The objectives of the flora and vegetation assessment were to:

- Conduct a desktop assessment of databases and spatial datasets to determine the environmental values and any potential issues, such as Threatened/Rare and significant species, Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs), that may be present in the Survey Area and the surrounding areas;
- Produce a list of plant species (including weed species);
- Document and map the location of any Threatened/Declared Rare Flora (T/DRF), Priority flora and any other flora of local or taxonomic significance;
- Identify, map and discuss the significance of any TECs, PECs and any other areas of ecological importance (e.g. National Parks, wetlands and Environmentally Sensitive Areas [ESAs] etc.);
- Assess, map and photograph vegetation condition; and
- Document, describe and map the vegetation associations present.