

PRECINCTS 1 & 2 THOMAS ROAD, CASUARINA

SIGNIFICANT TREE SURVEY

Prepared for: Aigle Royal Developments

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The logo for PGV Environmental is located in the bottom right corner of the page. It features the letters 'PGV' in a large, bold, white sans-serif font. To the right of 'PGV', the word 'ENVIRONMENTAL' is written in a smaller, white, all-caps sans-serif font. The background of the logo area is a vibrant orange with a subtle, curved white graphic element on the left side.

PGV ENVIRONMENTAL

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1 INTRODUCTION

1.1 Site Location

Algie Royal Developments is preparing a Local Structure Plan for Precincts 1 and 2 of Lots 3, 1199, 9011, 9012 and 9013 Thomas Road, Casuarina (the site). The site is located 30km to the south of the Perth Central Business District (Figure 1). The site is bounded by Thomas Road to the north, Kwinana Freeway to the west, 'Special Rural' lots to the south and the remainder of Lot 9013, which is undeveloped to the east (Figure 2).

1.2 Local Structure Plan

The Local Structure Plan for the site seeks to provide a Mixed Business land use on the site as well as land for drainage (Appendix 1). Two High Voltage Power Easements run north to south through the area.

1.3 Purpose and Scope

The Significant Tree Survey has been undertaken upon request of the City of Kwinana in accordance with Local Planning Policy No. 1 *Landscape Feature and Tree Retention* (City of Kwinana, 2016). The objectives of the policy are as follows:

To ensure that:

- a) *an appropriate level of information concerning significant trees and landscape features is provided at each stage of the planning framework;*
- b) *retention of significant trees and landscape features are optimised through the strategic and statutory planning framework to retain the character of the area.*

2 METHODOLOGY

Each tree on the site with a diameter greater than 500mm at breast height was assessed by Dr Paul van der Moezel and Jackie Cabot from PGV Environmental on 2 February 2018. The measurement of trunk diameter followed the method shown in Appendix A of Australian Standard 4970 *Protection of Trees on Development Sites*. According to AS 4970 trees can have single trunk diameter measured at breast height or, for trees with multiple trunks, each trunk can be measured and the appropriate formula applied to achieve the minimum 500mm measurement.

Each tree was assessed according to:

- Location;
- Species;
- Size;
- Structural health;
- habitat value; and
- landscape amenity value.

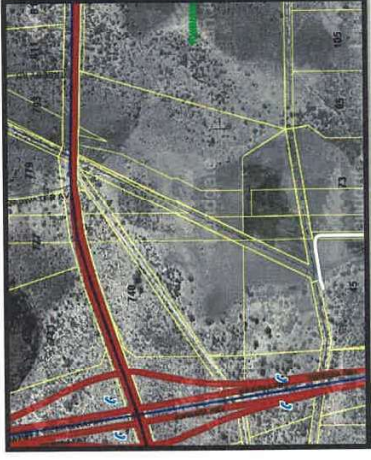
In addition, the location of each tree was recorded using a hand-held GPS.

3 SITE DESCRIPTION

3.1 Land Use

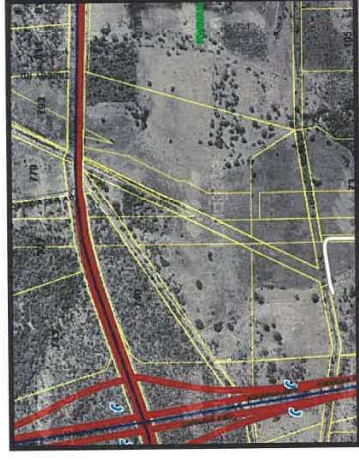
In earliest available aerial photography in 1953 half of the site has been completely cleared and the other half contains scattered trees that appear in a range of condition from parkland cleared to an area in the north-west that is likely to have an intact understorey (Plate 1).

Plate 1: Historical aerial photograph from 1953 (Landgate, 2017)



Aerial photography from 1965 shows further clearing of the site in the south-west corner (Plate 2). The vegetation in the north-western area remains as intact remnant vegetation.

Plate 2: Historical aerial photograph from 1965 (Landgate, 2017)



The January 2008 aerial photography shows most of the site was burnt just prior to the photo being taken (Plate 3). A recent fire occurred in the vegetation in the north-west corner of the site in the summer of 2017/18.

Plate 3: Aerial photography from January 2008 (Landgate, 2017).



3.2 Topography

The site is predominantly flat and low lying with two small rises in the north-west and south-west parts of the site. The elevation of the site varies between approximately 18 and 20m Australian Height Datum (AHD) (Figure 2).

3.3 Geology and Soils

3.3.1 Geology

The site is mapped as part of the Bassendean System and consists of very low relief, leached, grey siliceous Pleistocene sand dunes, intervening sandy and clayey swamps and gently undulating plains (Bolland, 1998). These soils are very leached, infertile and mildly acidic (DAFWA, 2017).

3.3.2 Soils

The soils on the site have been described by the Department of Agriculture and Food Western Australia (DAFWA) (2017) as:

- Bassendean B1 Phase (212Bs_B1) which are described as deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2m. These soils occur on extremely low to very low relief dunes, undulating sandplain and discrete sand rises; and
- Bassendean B3 Phase (212Bs_B3) are soils on closed depressions and poorly defined stream channels. These soils are moderately deep, bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.

The B1 phase is located on the western part of the site and the B3 on the eastern. The B3 soils are associated with the lower lying areas on the site (Figure 3).

3.4 Hydrology

3.4.1 Groundwater

The Perth Groundwater Map shows the top of the groundwater table at 11m to 13mAHD and is approximately 3 to 5m below the ground surface. Groundwater is generally flowing to the west (DWER, 2017). The groundwater around the wetland has geological formations that have been grouped into three distinct aquifers:

- Superficial Swan Aquifer;
- Leederville Aquifer, and
- Yarragadee North (DWER, 2017)

3.4.2 Surface Water

Surface water flow will be limited due to the permeable nature of the sandy B1 phase soils. Any overland flow is likely to drain to the eastern lower lying areas and the Drainage Line to the south of the site.

3.4.3 Wetlands

The site contains part of 'Sandy Lake' which is classified as Multiple Use Wetland with the Unique Feature Identifier (UFI) 6669 as mapped in the DPaW's *Geomorphic Wetlands of the Swan Coastal Plain* dataset (National Map, 2017). Wetland UFI 6669 is a Sumpland which is defined as a seasonally inundated basin (Hill *et al.*, 1996).

3.5 Flora and Vegetation

3.5.1 Flora

Two vegetation and flora surveys have been undertaken over the whole Aigle Royal landholding including the balance of lots to the east of the structure plan area (GHD, 2012; Bennett Environmental, 2010). The GHD Survey was conducted in May 2012 and a follow-up spring survey of the area was conducted in October 2012 by Bennett Environmental. A total of 133 species have been recorded on the whole site, of which 79 were native species and 54 introduced. None of the species are Threatened or Priority flora.

3.5.2 Vegetation

A total of five vegetation types occur in the structure plan area. These are:

- Banksia Woodland
- Eucalyptus and Melaleuca Open Woodland to Woodland
- Mixed Myrtaceous Closed Shrubland
- Sedgeland
- Cleared Paddocks

The pockets of native vegetation are rated as Very Good to Degraded and the remainder of the site is Completely Degraded.

4 RESULTS AND DISCUSSION

4.1 Trees Recorded on the Site

The significant tree survey recorded 38 trees in Precincts 1 and 2 that had a diameter at breast height greater than 500mm using the AS 4970 methodology (Figure 2). The trees consisted of six species, of which Paperbark (*Melaleuca rhaphiophylla*) was the most abundant (Table 2). All of the species are native and endemic to the area (Table 1).

Table 1: Tree Species on the Site

Species	Common Name	Native/Introduced	Number
<i>Allocasuarina fraseriana</i>	Sheoak	Native	1
<i>Banksia attenuata</i>	Slender Banksia	Native	2
<i>Eucalyptus marginata</i>	Jarrah	Native	1
<i>Eucalyptus rudis</i>	Flooded Gum	Native	13
<i>Melaleuca preissiana</i>	Paperbark	Native	4
<i>Melaleuca rhaphiophylla</i>	Paperbark	Native	17
Total			38

4.2 Tree Characteristics

4.2.1 Condition

There were no trees recorded in Excellent condition. Eight of the trees were classified as being in Good condition, however have evidence of fire damage (Plate 4).

Plate 4: Tree 23 and 24 in Good condition but impacted by fire



The remaining trees were in Fair or Poor condition with dead or burnt branches and/or burnt out trunks.

4.2.2 Height

Three of the trees were considered small (6m and below in height). Nineteen trees were between 6 and 10 metres in height and the remaining sixteen trees were greater than 10m in height.

4.2.3 Diameter

There were twelve trees with single trunks with a DBH of 500mm or greater and 26 trees with multiple trunks with a DBH of 500mm or greater using the AS 4970 method. Thirteen trees had a diameter greater than 750mm, the remaining trees had a diameter between 500-700mm using the AS 4970 method.

4.2.4 Habitat Values

All the trees would provide some habitat for birds. There were very few trees with hollows and no hollows were large enough to be considered suitable for Black Cockatoo nesting.

The Jarrah, Banksia and Sheoak may provide foraging value to Carnaby's Black Cockatoo and Baudin's Cockatoo and to a limited extent for Forest Red-tail Black Cockatoos. There was no foraging observed at the time of the survey with most of the foraging habitat in the north-west corner of the site recently being burnt.

4.2.5 Retention Potential

The site contained 16 significant trees in Fair condition, eight in Good condition and the remaining fourteen trees are in Poor condition, largely due to the impacts of regular fires. The eight trees in Good condition still showed the impacts of fire.

None of the 38 trees had any particular feature that would recommend them for retention in a future development.

5 CONCLUSIONS AND RECOMMENDATIONS

A total of 38 trees with a DBH of 500mm or greater, measure using the AS4970 method were recorded in Precincts 1 and 2 of the proposed mixed use development on Thomas Road, Casuarina.

Sixteen of the trees were rated in Fair condition, eight in Good condition and fourteen in Poor condition. The overall low rating of the trees was largely due to the impacts of regular fires.

None of the 38 trees had any particular feature that would recommend them for retention in a future development.

Most of the trees would not be able to be retained due to safety issues over the tree's structural integrity.

6 REFERENCES

- Australian Standard (2010) *Protection of Trees on Development Sites*. AS 4970. Published by Standards Australia, March 2010
- Bennett Environmental Consulting Pty Ltd (2012) Spring Survey at Lot 650 Thomas Road, Casuarina Perth, Western Australia
- Bolland, M. (1998) *Soils of the Swan Coastal Plain*. Department of Agriculture. Bunbury, Western Australia.
- City of Kwinana (2016) Local Planning Policy No. 1 *Landscape Feature and Tree Retention* Western Australia
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- Hilli, A.L., Semeniuk, C.A., Semeniuk, V. and Del Marco, A. (1996) *Wetlands of the Swan Coastal Plain*. Vol. 2A Wetland Mapping, Classification and Evaluation Main Report. Perth, Western Australia.
- Landgate (2017) Historical Aerial Photography. Accessed July 2017 <https://www.landgate.wa.gov.au/bmyf/app/mapviewer/> Government of Western Australia, Perth.
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FIGURES

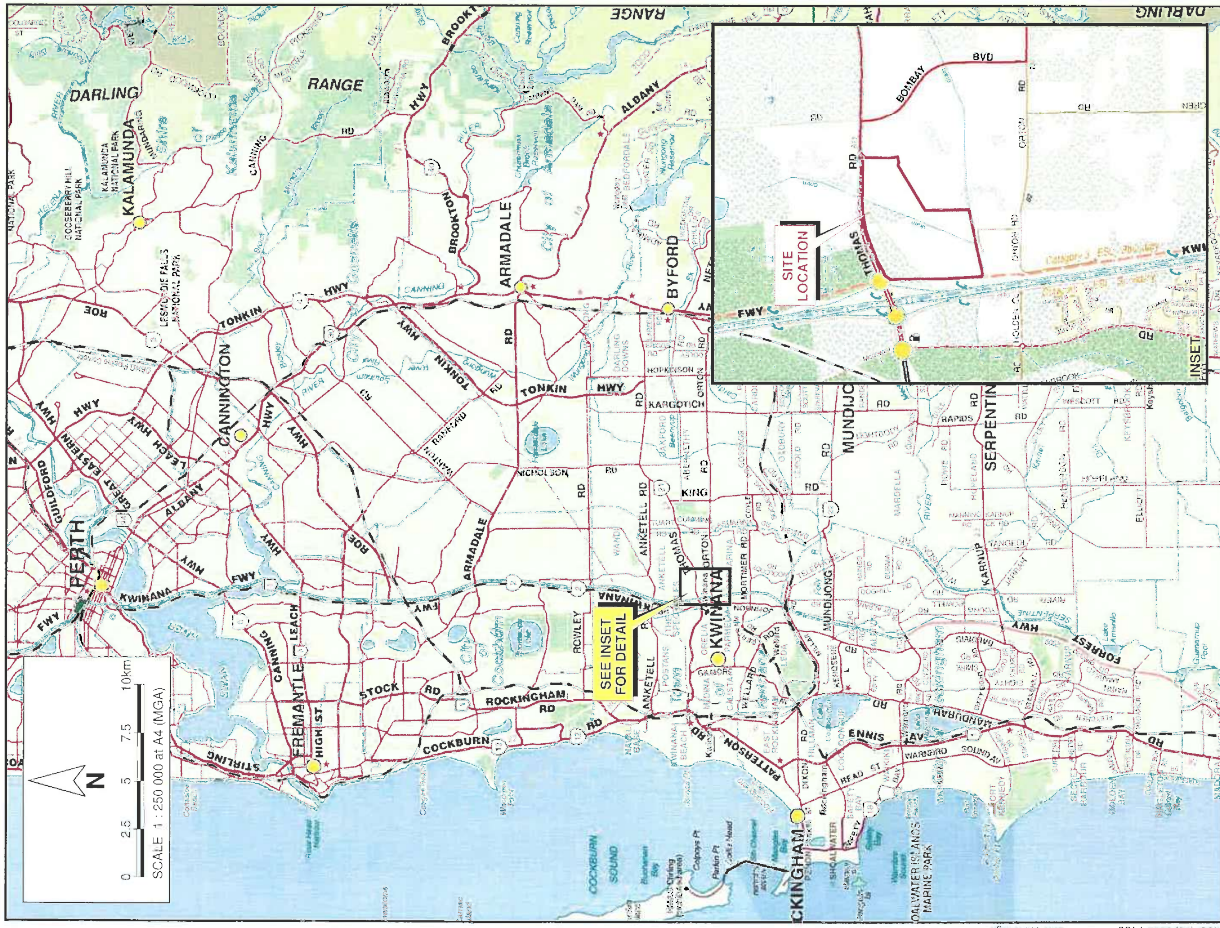


Figure 1

Agria Royal
SIGNIFICANT TREE SURVEY
PRECINCTS 1:2 THOMAS ROAD, CASUARINA

PGV ENVIRONMENTAL

Drawn: J. Cochrane Date: 3 Mar 2016
Job: 10247 Proj: 2011-368 Rev: 001 A

SITE LOCATION

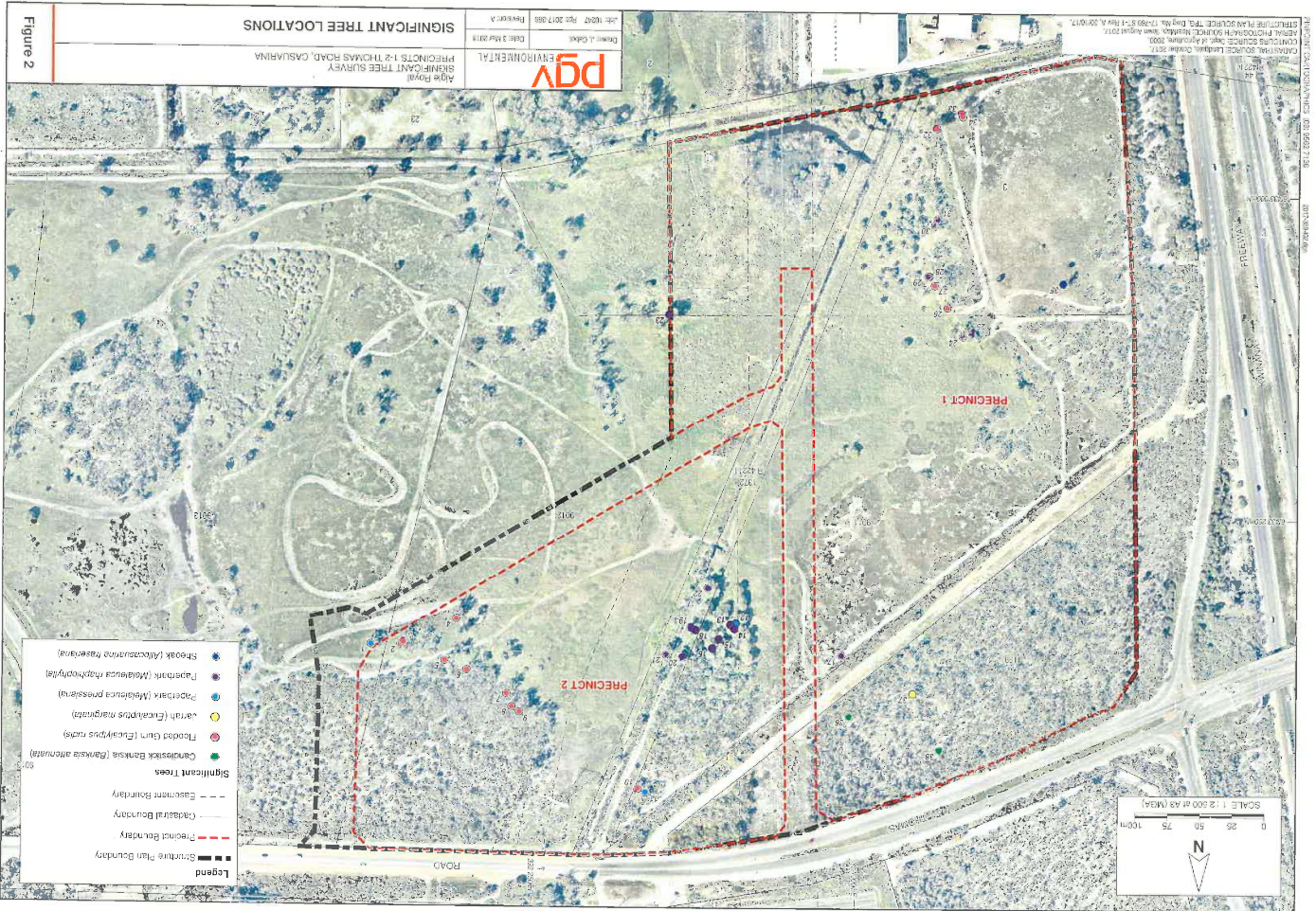


Figure 2

Age Royal
 SIGNIFICANT TREE SURVEY
 PRECINCTS 1-2 THOMAS ROAD, CASUARINA

pgv ENVIRONMENTAL

DATE: 2 May 2018
 DRAWN BY: [Name]

CONSTRUCTION PLAN SOURCE: Landmark Group 2017
 CONSTRUCTION PLAN SOURCE: [Name] 2017
 CONSTRUCTION PLAN SOURCE: [Name] 2017
 CONSTRUCTION PLAN SOURCE: [Name] 2017

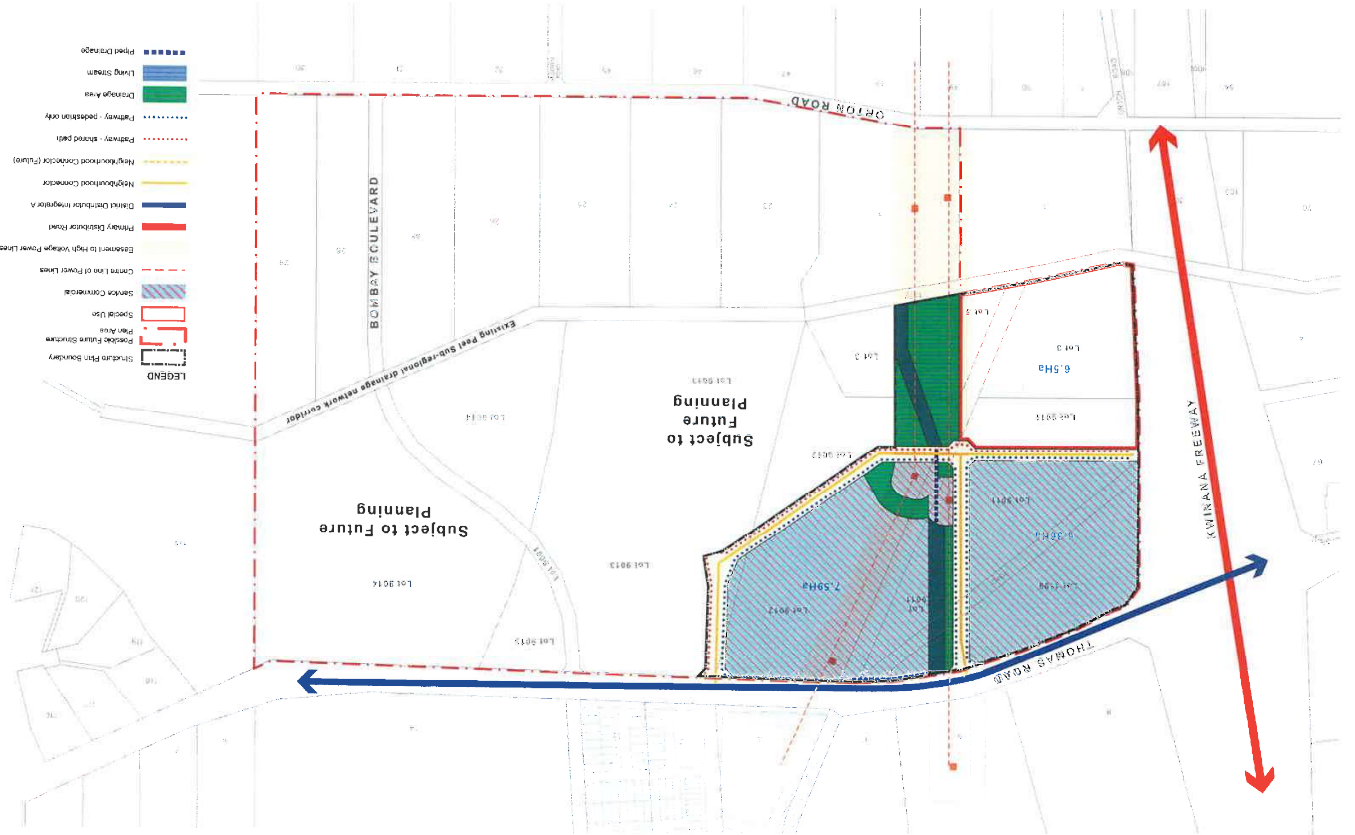
APPENDIX 1

Local Structure Plan

Plan 1: Local Structure Plan

Lots 9011, 9012, 9013, 1199 & 3 Thomas Road, Casuarina

Project Name: Local Structure Plan
 Date: 17/08/2011
 Scale: 1:1000
 Author: [Name]
 Checked: [Name]
 Approved: [Name]



APPENDIX 2
Tree Survey Results

Tree	Easting	Northing	Species	Height	DBH1	DBH2	DBH3	DBH4	Calculated	Notes
1	392375	6433350	Paperbark (Melaleuca preissiana)	8	80	6	40	30	80	Fair condition, sprouting after fire damage
2	392372	6433350	Flooded Gum (Eucalyptus rudis)	6	40	6	30	50	50	Fair condition, sprouting after fire damage
3	392350	6433348	Flooded Gum (Eucalyptus rudis)	7	70	5	35	76	82	Fair condition, sprouting after fire damage
4	392350	6433330	Flooded Gum (Eucalyptus rudis)	9	7	7	30	76	76	Fair condition, sprouting after fire damage
5	392318	6433352	Flooded Gum (Eucalyptus rudis)	12	110	10	30	110	110	Fair condition, dead parts and fire damage
6	392301	6433369	Flooded Gum (Eucalyptus rudis)	10	66	6	30	66	66	Fair condition, sprouting after fire damage
7	392270	6433387	Flooded Gum (Eucalyptus rudis)	9	40	40	29	58	58	Fair condition, white ants present
8	392266	6433397	Flooded Gum (Eucalyptus rudis)	11	42	39	39	57	57	Fair condition, sprouting after fire damage
9	392250	6433401	Flooded Gum (Eucalyptus rudis)	11	40	40	32	64	64	Fair condition, sprouting after fire damage
10	392188	6433460	Paperbark (Melaleuca preissiana)	6	45	28	50	70	70	Fair condition, sprouting after fire damage
11	392152	6433463	Paperbark (Melaleuca preissiana)	6	6	6	50	70	70	Fair condition, burnt
12	392097	6433333	Paperbark (Melaleuca preissiana)	8	40	39	38	78	78	Fair condition, burnt
13	392097	6433333	Paperbark (Melaleuca preissiana)	8	40	39	38	68	68	Fair condition, burnt
14	392094	6433336	Paperbark (Melaleuca preissiana)	8	65	26	26	70	70	Poor, burnt large dead portions
15	392106	6433344	Paperbark (Melaleuca preissiana)	9	40	40	40	57	57	Poor, burnt large dead portions
16	392111	6433351	Paperbark (Melaleuca preissiana)	9	35	35	35	55	55	Poor, burnt large dead portions
17	392011	6433356	Paperbark (Melaleuca preissiana)	11	89	89	43	89	89	Poor, burnt large dead portions
18	392124	6433337	Paperbark (Melaleuca preissiana)	9	38	38	43	57	57	Poor, burnt large dead portions
19	392128	6433335	Paperbark (Melaleuca preissiana)	9	70	70	70	70	70	Fair condition, burnt
20	392134	6433358	Paperbark (Melaleuca preissiana)	11	54	54	46	71	71	Good condition, minor fire damage
21	392147	6433356	Paperbark (Melaleuca preissiana)	9	65	65	46	65	65	Fair condition, burnt
22	392115	6433305	Paperbark (Melaleuca preissiana)	11	70	70	85	110	110	Good condition, large specimen, minor fire damage
23	392146	6433394	Paperbark (Melaleuca preissiana)	10	47	40	40	86	86	Good condition, minor fire damage
24	391919	6433109	Paperbark (Melaleuca preissiana)	8	45	49	35	76	76	Good condition, minor fire damage
25	391917	6433106	Paperbark (Melaleuca preissiana)	9	70	70	50	70	70	Good condition, minor fire damage
26	391931	6433087	Flooded Gum (Eucalyptus rudis)	8	74	74	50	89	89	Good condition, minor fire damage
27	391941	6433070	Flooded Gum (Eucalyptus rudis)	12	100	100	100	100	100	Good condition, large specimen
28	391945	6433065	Paperbark (Melaleuca preissiana)	10	53	53	53	53	53	Fair condition, impacted by fire
29	391946	6433063	Paperbark (Melaleuca preissiana)	10	65	30	30	72	72	Fair condition, impacted by fire
30	391941	6433023	Paperbark (Melaleuca preissiana)	7	58	41	41	73	73	Fair condition, impacted by fire
31	391939	6433018	Paperbark (Melaleuca preissiana)	8	43	36	38	78	78	Fair condition, impacted by fire
32	391940	6432948	Flooded Gum (Eucalyptus rudis)	10	61	45	45	76	76	Good condition, large specimen, minor fire damage
33	391921	6432936	Flooded Gum (Eucalyptus rudis)	12	70	70	70	70	70	Poor condition, fire damage
34	391920	6432930	Flooded Gum (Eucalyptus rudis)	12	73	73	73	73	73	Poor condition, fire damage
35	391841	6432068	Sheoak (Allocasuarina fraseriana)	9	63	63	63	63	63	Poor condition, fire damage
36	392005	6433403	Candlestick Banksia (Banksia attenuata)	9	37	37	38	53	53	Poor condition recently burnt and fire damage
37	391956	6433385	Jarrah (Eucalyptus marginata)	11	43	29	29	52	52	Poor condition recently burnt and fire damage
38	391935	6433429	Candlestick Banksia (Banksia attenuata)	10	40	32	32	51	51	Poor condition recently burnt and fire damage

APPENDIX 3

Tree Photos

Thomas Road Casaurina

Trees 1-4



Trees 5 and 6



Trees 7 and 8



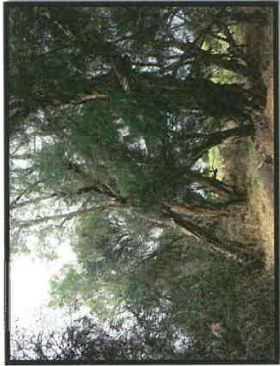
Tree 9



Trees 10 and 11



Trees 12, 13 and 14



Thomas Road Casaurina

Tree 15



Trees 16 and 17



Trees 18 and 19



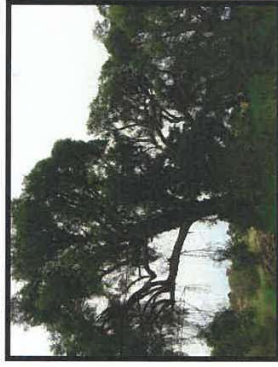
Tree 20



Tree 21



Tree 22



Thomas Road Casaurina

Tree 23



Trees 24 and 25



Tree 26



Tree 27



Trees 28 and 29



Trees 30 and 31



Thomas Road Casaurina

Tree 32



Trees 33 and 34



Tree 35



Tree 36

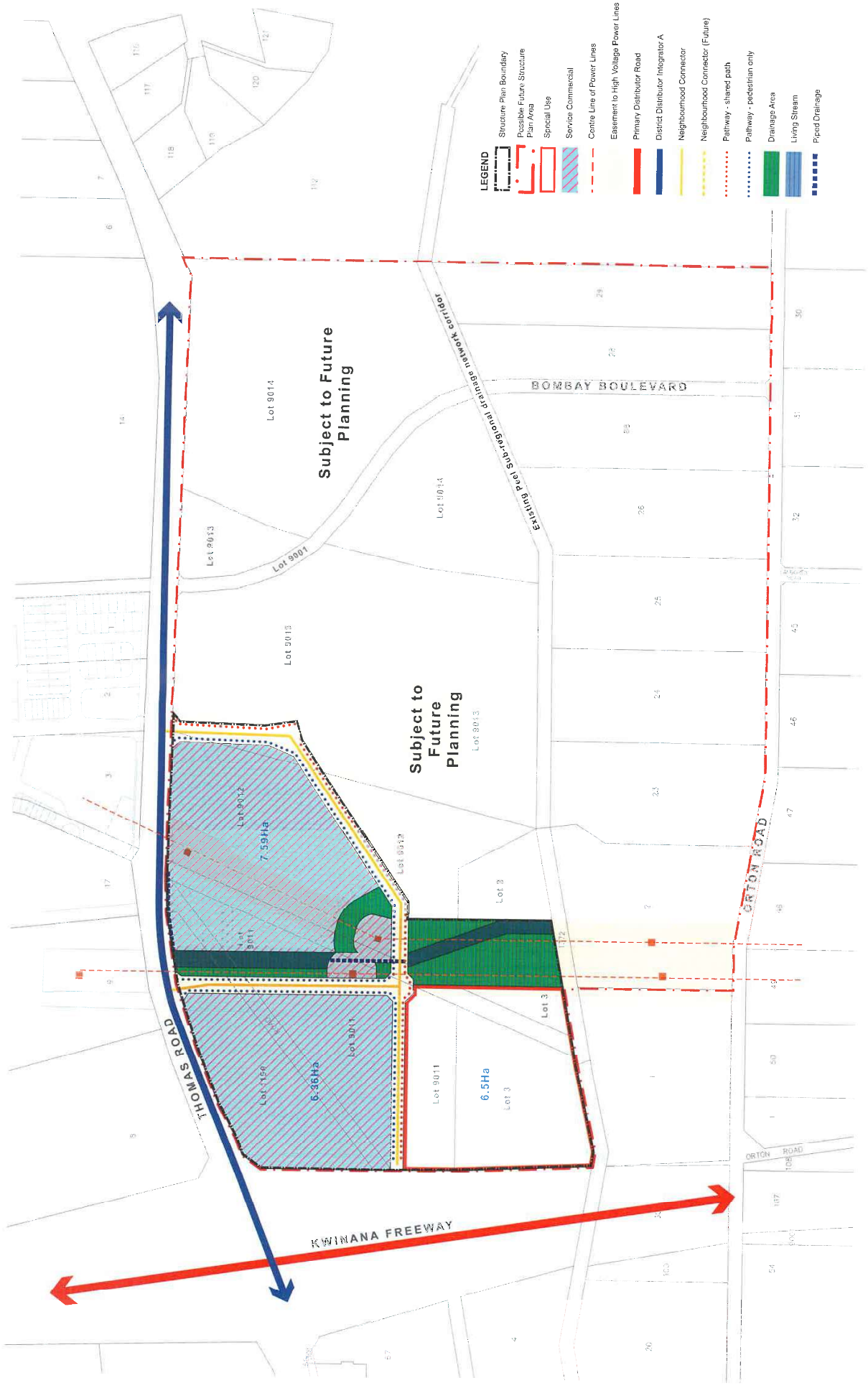


Tree 37



Tree 38





Plan 1: Local Structure Plan

Lots 9011, 9012, 9013, 1199 & 3 Thomas Road, Casuarina

0 50 100m
 Project Manager: MC Date: 14 Aug 2018
 Drawn: CF Scale: 1:5,000 @ A3
 Checked: MC Drawing No: 17-788 ST-1 A





