

FIGURES



LOCALITY MAP

Legend

- Survey Area (49.71 ha)
- Geomorphic Wetlands**
 - Conservation
 - Resource Enhancement
 - Multiple Use
 - Not Assessed

DATA SOURCES

- CADASTRAL BOUNDARY SOURCED FROM LANDGATE 2009
- LOCALITY MAP SOURCED LANDGATE 2006, WETLANDS SOURCED DPAW JAN 2016
- AERIAL PHOTOGRAPHY SOURCED LANDGATE FEB 2016
- © Western Australian Land Information Authority 2015

360 environmental
a10 Bernonsey St, West Leederville, 6007 WA
t (08) 9388 8360 f (08) 9381 2360
www.360environmental.com.au

people planet professional

WATER CORPORATION

CREATED JJ	CHECKED NW/RF	APPROVED MRh	REVISION 0	DATE 15/06/2016
HORIZONTAL DATUM GDA 1994 MGA Zone 50			PROJECT NO 1663	

0 100 200 400 600 800 1,000
Meters
1:25,000 @ A3

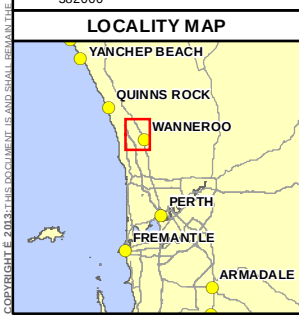
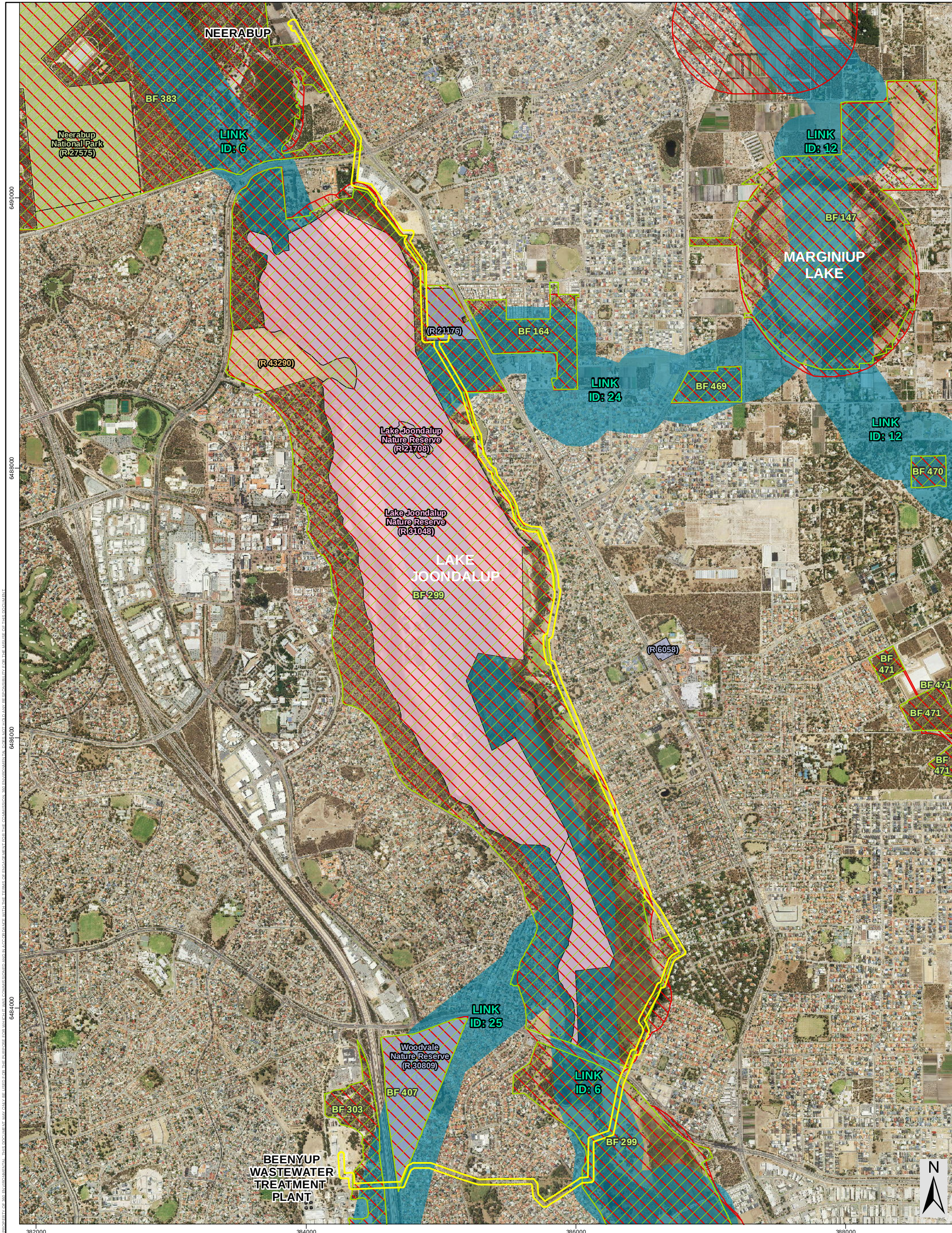
SLIP ENABLER

Water Corporation
Groundwater Replenishment Scheme
Beenyp Stage 3 Pipeline

Flora and Fauna Survey

Figure 3
Geomorphic Wetlands

COPYRIGHT © 2016 THIS DOCUMENT IS AND SHALL REMAIN THE PROPERTY OF 360 ENVIRONMENTAL. THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE COMMISSION. 360 ENVIRONMENTAL DOES NOT HOLD ANY RESPONSIBILITY FOR THE MISUSE OF THIS DOCUMENT.



Legend

- Survey Area (49.71 ha)
- Bush Forever Sites
- Environmentally Sensitive Areas
- Perth Regional Ecological Linkages

DPaW Managed Lands and Waters

- Conservation Park
- Miscellaneous Reserve
- National Park
- Nature Reserve

DATA SOURCES

- CADASTRAL BOUNDARY SOURCED FROM LANDGATE 2009
- DPaW LANDS SOURCED DPAW 2016, BF SITES SOURCED DOP 2014, ECOLOGICAL LINKAGES SOURCED PBP (WALGA 2008), ESAS SOURCED DPAW 2015
- LOCALITY MAP SOURCED LANDGATE 2009, AERIAL PHOTOGRAPHY SOURCED LANDGATE FEB 2016
- (© Western Australian Land Information Authority 2015)

SLIP ENABLER

NOTE THAT POSITIONAL ERRORS MAY BE >5M IN SOME AREAS

360 environmental

a10 Bernondsey St, West Leederville, 6007 WA
t(08) 9388 8360 f(08) 9381 2360
www.360environmental.com.au

people planet professional

WATER CORPORATION

CREATED JJ	CHECKED NW/RF	APPROVED MRh	REVISION 0	DATE 15/06/2016
HORIZONTAL DATUM GDA 1994 MGA Zone 50			PROJECT NO 1663	

0 100 200 400 600 800 1,000

Meters

1:25,000 @ A3

Water Corporation

Groundwater Replenishment Scheme

Beenyup Stage 3 Pipeline

Flora and Fauna Survey

Figure 4

Conservation Areas

COPYRIGHT © 2016 THIS DOCUMENT IS AND SHALL REMAIN THE PROPERTY OF 360 ENVIRONMENTAL. THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE MISUSE OF THIS DOCUMENT.



Legend

Survey Area

- Priority 4
- Priority 3
- Priority 2
- Priority 1
- Declared Rare

Threatened/Priority Ecological Communities

- PEC - Priority 4
- PEC - Priority 3
- PEC - Priority 2
- PEC - Priority 1
- TEC - Vulnerable
- TEC - Endangered
- TEC - Critically Endangered

TEC/PEC DESCRIPTIONS

- SCP24 (P3): Northern Spearwood shrublands and woodlands
- SCP25 (P3): Banksia attenuata woodlands over species rich dense shrublands
- SCP20a (En): Southern Eucalyptus gomphocephala-Agonis flexuosa woodlands

DATA SOURCES

- CADASTRAL BOUNDARY SOURCED FROM LANDGATE 2009
- TEC/PEC DATA PURCHASED DPW 12 MAY 2016, FLORA DATA PURCHASED DPW 16 MAY 2016 (REF 15-0516FL)
- LOCALITY MAP SOURCED LANDGATE 2009, AERIAL PHOTOGRAPHY SOURCED LANDGATE FEB 2016
- © Western Australian Land Information Authority 2015

SLIP ENABLER

360 environmental

a10 Bernonsey St, West Leederville, 6007 WA
t (08) 9388 8360 f (08) 9381 2360
www.360environmental.com.au

people planet professional

WATER CORPORATION

CREATED JJ	CHECKED NW/RF	APPROVED MRh	REVISION 0	DATE 15/06/2016
HORIZONTAL DATUM GDA 1994 MGA Zone 50			PROJECT NO 1663	

0 100 200 400 600 800 1,000 Meters
1:25,000 @ A3

Water Corporation

Groundwater Replenishment Scheme

Beenyup Stage 3 Pipeline

Flora and Fauna Survey

Figure 5

DPaW Database Search Records

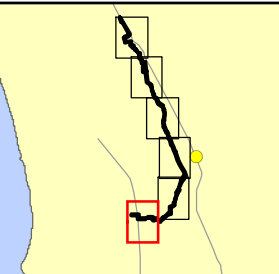
COPYRIGHT © 2016 THIS DOCUMENT IS AND SHALL REMAIN THE PROPERTY OF 360 ENVIRONMENTAL. THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE PURPOSE OF THIS DOCUMENT.



Vegetation Unit Descriptions

- | | |
|--------|---|
| Af | <i>Allocasuarina fraseriana</i> |
| AFBa | <i>Allocasuarina fraseriana</i> over <i>Banksia attenuata</i> |
| As | <i>Acacia saligna</i> |
| Ba | <i>Banksia attenuata</i> |
| BaBg | Low open woodland of <i>Banksia attenuata</i> , <i>Banksia grandis</i> , <i>Eucalyptus marginata</i> over <i>Xanthorrhoea preissii</i> , <i>Hakea laevis</i> and <i>Hakea prostrata</i> |
| BmJf | <i>Banksia menziesii</i> over <i>Jacksonia furellata</i> and <i>Thysanotus dichotomus</i> |
| Cc | <i>Corymbia calophylla</i> |
| CcEmBa | Woodland of <i>Corymbia calophylla</i> , <i>Eucalyptus marginata</i> , <i>Banksia attenuata</i> , <i>Banksia menziesii</i> and <i>Allocasuarina fraseriana</i> over <i>Hibbertia hypericoides</i> , <i>Xanthorrhoea preissii</i> , <i>Macrozamia nederi</i> , <i>Mesomelaena pseudostygia</i> , <i>Jacksonia scarnbergiana</i> , <i>Jacksonia furellata</i> , <i>Hibbertia racemosa</i> and <i>Desmodium illinoense</i> |
| Ea | <i>Eucalyptus accedens</i> |
| Eg | <i>Eucalyptus gomphocephala</i> |
| EgEt | Woodland of <i>Eucalyptus gomphocephala</i> , <i>Eucalyptus totiana</i> , <i>Eucalyptus calophylla</i> , Non-endemic <i>Eucalyptus</i> sp. and <i>Banksia</i> over <i>Hardenbergia comptoniae</i> and introduced species |
| EgLi | <i>Eucalyptus gomphocephala</i> over <i>Lepidosperma longistylis</i> |
| EgPe | <i>Eucalyptus gomphocephala</i> over <i>Pteridium esculentum</i> |
| Em | <i>Eucalyptus marginata</i> |
| EmAf | Low Woodland of <i>Eucalyptus marginata</i> , <i>Allocasuarina fraseriana</i> , <i>Banksia attenuata</i> , <i>Banksia menziesii</i> over <i>Xanthorrhoea preissii</i> , <i>Macrozamia nederi</i> , <i>Hibbertia hypericoides</i> and <i>*Eriofora corymbosa</i> |
| EmJf | <i>Eucalyptus marginata</i> over <i>Jacksonia furellata</i> and <i>Macrozamia nederi</i> |
| Er | <i>Eucalyptus rudis</i> |
| ErG | <i>Eucalyptus rudis</i> over Garden/non-endemic species |
| Jf | <i>Jacksonia furellata</i> |
| Ma | <i>Melaleuca azedarach</i> |
| Mr | <i>Melaleuca raphiophylla</i> isolated trees |
| MrEr | <i>Melaleuca raphiophylla</i> and <i>Eucalyptus rudis</i> |
| MrLi | Low woodland of <i>Melaleuca raphiophylla</i> and <i>Eucalyptus rudis</i> over <i>Bauhinia articulata</i> and <i>Lepidosperma longistylis</i> |
| Mrpe | Low Woodland of <i>Melaleuca raphiophylla</i> over <i>Pteridium esculentum</i> , <i>Acacia saligna</i> and <i>Acacia rostellifera</i> |
| To | <i>Typha orientalis</i> |
| CcEg | <i>Corymbia calophylla</i> / <i>Eucalyptus gomphocephala</i> |
| CcEmEr | <i>Corymbia calophylla</i> / <i>Eucalyptus marginata</i> / <i>Eucalyptus rudis</i> |
| EgCc | <i>Eucalyptus gomphocephala</i> / <i>Corymbia calophylla</i> |
| EgEm | <i>Eucalyptus gomphocephala</i> / <i>Eucalyptus marginata</i> |
| EgG | <i>Eucalyptus gomphocephala</i> / <i>Garden/non-endemic species</i> |
| ErAs | <i>Eucalyptus rudis</i> / <i>Acacia saligna</i> |
| ErG | <i>Eucalyptus rudis</i> / <i>Garden/non-endemic species</i> |
| ErJf | <i>Eucalyptus rudis</i> / <i>Jacksonia furellata</i> |
| GfAf | <i>Garden/non-endemic species</i> / <i>Allocasuarina fraseriana</i> |
| ToEr | <i>Typha orientalis</i> / <i>Eucalyptus rudis</i> |
| G | <i>Garden/non-endemic species</i> |
| PP | * <i>Pinus pinaster</i> |
| | Rehabilitation Area |
| | Completely Degraded |
| | Built Environment |
| | Road |
| | Not Surveyed |

LOCALITY MAP



Legend

- Development Envelope
 - Survey Area
 - Rehabilitation Area
 - Not Surveyed
- Vegetation Units
- Af
 - AFBa
 - As

DATA SOURCES

- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2014
- © Western Australian Land Information Authority 2015

Ba

BaBg

BmJf

Cc

CcEmBa

Ea

Eg

EgEt

EgLi

EgPe

Em

EmAf

EmJf

Er

ErG

Jf

M

Ma

Mr

MrEr

MrLi

Mrpe

Ne

To

Cc/Em/Er

Eg/Cc

Eg/Em

Eg/G

Er/As

Er/G

Er/Jf

G/Af

To/Er

G

PP

Completely Degraded

Built Environment

Road

Priority 3 Species

Quadrat

Releve

SLIP ENABLER

NOTE THAT POSITIONAL ERRORS MAY BE >5M IN SOME AREAS

360 environmental

a10 Berrymore St, West Leederville, 6007 WA
t (08) 9388 8360 f (08) 9381 2360
www.360environmental.com.au

people

planet

professional



CREATED

MH

CHECKED

NW

APPROVED

RF

REVISION

0

DATE

14/10/2016

HORIZONTAL DATUM

GDA 1994 MGA Zone 50

PROJECT NO

1663

0

25

50

100

150

200

250

Meters

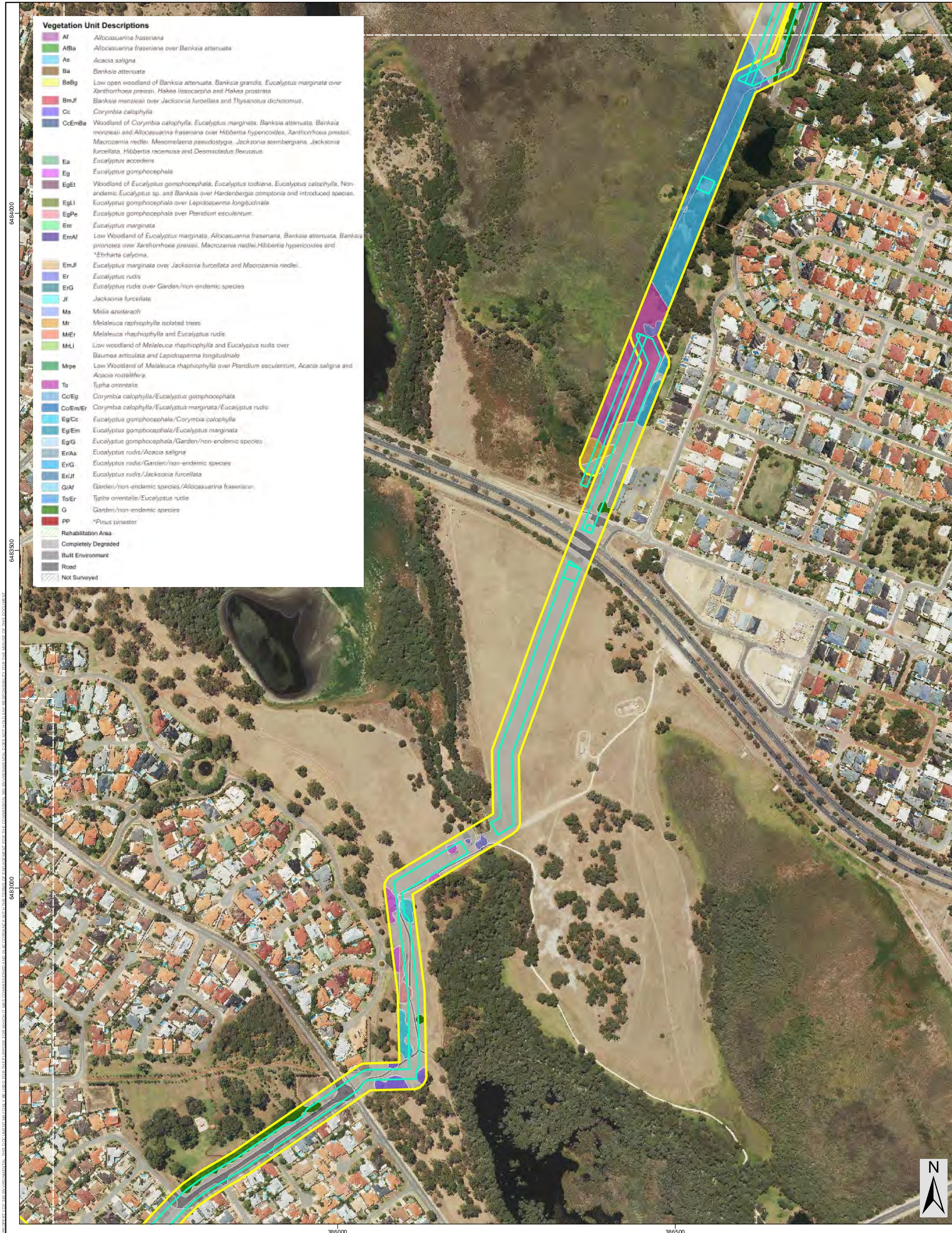
1:5,000 @ A3

Water Corporation
Groundwater Replenishment Scheme
Beenyup Stage 3 Pipeline

Level 2 Flora Survey

Figure 6a
Vegetation Units

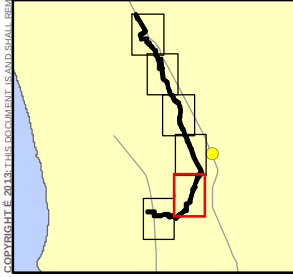
K:\Projects\1.0 EBS\1663 Beenyup Stage 3 Pipeline Surveys\Figures\September Flora Survey\1663 - Figure X Vegetation Units A.mxd



Vegetation Unit Descriptions

- Af** *Allocasuarina fraseriana*
- AfBa** *Allocasuarina fraseriana* over *Banksia attenuata*
- As** *Acacia saligna*
- Ba** *Banksia attenuata*
- BaBg** Low open woodland of *Banksia attenuata*, *Banksia grandis*, *Eucalyptus marginata* over *Xanthorrhoea preissii*, *Hakea leucocarpa* and *Hakea prostrata*
- BmJf** *Banksia menziesii* over *Jacksonia furcellata* and *Thysanotus dichotomus*
- Cc** *Corymbia calophylla*
- CcEmBa** Woodland of *Corymbia calophylla*, *Eucalyptus marginata*, *Banksia attenuata*, *Banksia menziesii* and *Allocasuarina fraseriana* over *Hibbertia hypericoides*, *Xanthorrhoea preissii*, *Macrozamia neldi*, *Masomelaena pseudostygia*, *Jacksonia saarnbergiana*, *Jacksonia furcellata*, *Hibbertia racemosa* and *Desmodium illinoense*
- Ea** *Eucalyptus accedens*
- Eg** *Eucalyptus gomphocephala*
- EgEt** Woodland of *Eucalyptus gomphocephala*, *Eucalyptus tottiana*, *Eucalyptus calophylla*, Non-endemic *Eucalyptus* sp. and *Banksia* over *Hardenbergia comptoniae* and introduced species, *Eucalyptus gomphocephala* over *Leptosperma longidula*
- EgLi** *Eucalyptus gomphocephala* over *Pteridium esculentum*
- EgPe** *Eucalyptus gomphocephala* over *Pteridium esculentum*
- Em** *Eucalyptus marginata*
- EmAf** Low Woodland of *Eucalyptus marginata*, *Allocasuarina fraseriana*, *Banksia attenuata*, *Banksia prostrata* over *Xanthorrhoea preissii*, *Macrozamia neldi*, *Hibbertia hypericoides* and **Ehrharta calyons*
- EmJf** *Eucalyptus marginata* over *Jacksonia furcellata* and *Macrozamia neldi*
- Er** *Eucalyptus rudis*
- ErG** *Eucalyptus rudis* over Garden/non-endemic species
- Jf** *Jacksonia furcellata*
- Ma** *Melia azedarach*
- Mr** *Melaleuca raphiophylla* isolated trees
- MrEr** *Melaleuca raphiophylla* and *Eucalyptus rudis*
- MrLi** Low woodland of *Melaleuca raphiophylla* and *Eucalyptus rudis* over *Baumea articulata* and *Leptosperma longidula*
- Mrpe** Low Woodland of *Melaleuca raphiophylla* over *Pteridium esculentum*, *Acacia saligna* and *Acacia rostellifera*
- To** *Typha orientalis*
- Cc/Eg** *Corymbia calophylla*/*Eucalyptus gomphocephala*
- CcEm/Er** *Corymbia calophylla*/*Eucalyptus marginata*/*Eucalyptus rudis*
- Eg/Cc** *Eucalyptus gomphocephala*/*Corymbia calophylla*
- Eg/Em** *Eucalyptus gomphocephala*/*Eucalyptus marginata*
- Eg/G** *Eucalyptus gomphocephala*/Garden/non-endemic species
- Er/As** *Eucalyptus rudis*/*Acacia saligna*
- Er/G** *Eucalyptus rudis*/Garden/non-endemic species
- Er/Jf** *Eucalyptus rudis*/*Jacksonia furcellata*
- G/Af** Garden/non-endemic species/*Allocasuarina fraseriana*
- To/Er** *Typha orientalis*/*Eucalyptus rudis*
- G** Garden/non-endemic species
- PP** **Pinus pinaster*
- Rehabilitation Area**
- Completely Degraded**
- Built Environment**
- Road**
- Not Surveyed**

LOCALITY MAP



Legend

- Development Envelope**
- Survey Area**
- Rehabilitation Area**
- Not Surveyed**
- Vegetation Units**
- Af**
- AfBa**
- As**
- Ba**
- BaBg**
- BmJf**
- Cc**
- CcEmBa**
- Ea**
- Eg**
- EgEt**
- EgLi**
- EgPe**
- Em**
- EmAf**
- EmJf**
- Er**
- ErG**
- Jf**
- Ma**
- Mr**
- MrEr**
- MrLi**
- Mrpe**
- Ne**
- To**
- Cc/Eg**
- CcEm/Er**
- Eg/Cc**
- Eg/Em**
- Eg/G**
- Er/As**
- Er/G**
- Er/Jf**
- G/Af**
- To/Er**
- G**
- PP**
- Completely Degraded**
- Built Environment**
- Road**
- Priority 3 Species**
- Quadrat**
- Releve**
- Note** Priority 3 species refers to *Conostylis bracteata*

DATA SOURCES

- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2014
- (© Western Australian Land Information Authority 2015)

360
environmental

Water Corporation

10 Berrymore St, West Leederville, 6007 WA
t (08) 9388 8360 f (08) 9381 2360
www.360environmental.com.au

WATER
CORPORATION

CREATED MH
CHECKED NW
APPROVED RF
REVISION 0
DATE 14/10/2016

HORIZONTAL DATUM
GDA 1994 MGA Zone 50

PROJECT NO
1663

0 25 50 100 150 200 250

Meters

1:5,000 @ A3

Water Corporation
Groundwater Replenishment Scheme

Level 2 Flora Survey

Figure 6b
Vegetation Associations

COPYRIGHT © 2015 THIS DOCUMENT IS THE PROPERTY OF 360 ENVIRONMENTAL. THIS DOCUMENT MAY NOT BE USED FOR THE PURPOSES OF THE PROJECT FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE COMMISSION. 360 ENVIRONMENTAL DOES NOT HOLD ANY RESPONSIBILITY FOR THE MISUSE OF THIS DOCUMENT.



LOCALITY MAP

Legend

Development Envelope	Ba	EgLi	M	Cc/Em/Er	G
Survey Area	BaBg	EgPe	Ma	Eg/Cc	PP
Rehabilitation Area	BmJf	Em	Mr	Eg/Em	Completely Degraded
Not Surveyed	Cc	EmAf	MrEr	Eg/G	Built Environment

Vegetation Units

Af	Ea	Er	Mrpe	Er/As
AfBa	Eg	ErG	Ne	Er/Jf
As	EgEt	Jf	To	G/Af
			Cc/Eg	To/Er

DATA SOURCES

- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2014
- (© Western Australian Land Information Authority 2015)

360
environmental

people planet professional

WATER
CORPORATION

CREATED MH CHECKED NW APPROVED RF REVISION 0 DATE 14/10/2016

HORIZONTAL DATUM GDA 1994 MGA Zone 50 PROJECT NO 1663

0 25 50 100 150 200 250 Meters

1:5,000 @ A3

Water Corporation
Groundwater Replenishment Scheme

Level 2 Flora Survey

Figure 6c
Vegetation Associations

COPYRIGHT © 2015 THIS DOCUMENT IS AND SHALL REMAIN THE PROPERTY OF 360 ENVIRONMENTAL. THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSES FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE COMMISSION. NO ENVIRONMENTAL DOES NOT HOLD ANY RESPONSIBILITY FOR THE MISUSE OF THIS DOCUMENT.



LOCALITY MAP

Legend

Development Envelope	Ba	EgLi	M	Cc/Em/Er	G
Survey Area	BaBg	EgPe	Ma	Eg/Cc	PP
Rehabilitation Area	BmJf	Em	Mr	Eg/Em	Completely Degraded
Not Surveyed	Cc	EmAf	MrEr	Eg/G	Built Environment

Vegetation Units

Af	Ea	Er	Mrpe	To
AfBa	Eg	Er	Mrpe	To
As	EgEt	Jf	To	To

DATA SOURCES

- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2014
- (© Western Australian Land Information Authority 2015)

360 environmental

a10 Berrymore St, West Leederville, 6007 WA
t (08) 9388 8360 f (08) 9381 2360
www.360environmental.com.au

people planet professional

WATER CORPORATION

CREATED	CHECKED	APPROVED	REVISION	DATE
MH	NW	RF	0	14/10/2016

HORIZONTAL DATUM: GDA 1994 MGA Zone 50
PROJECT NO: 1663

0 25 50 100 150 200 250 Meters
1:5,000 @ A3

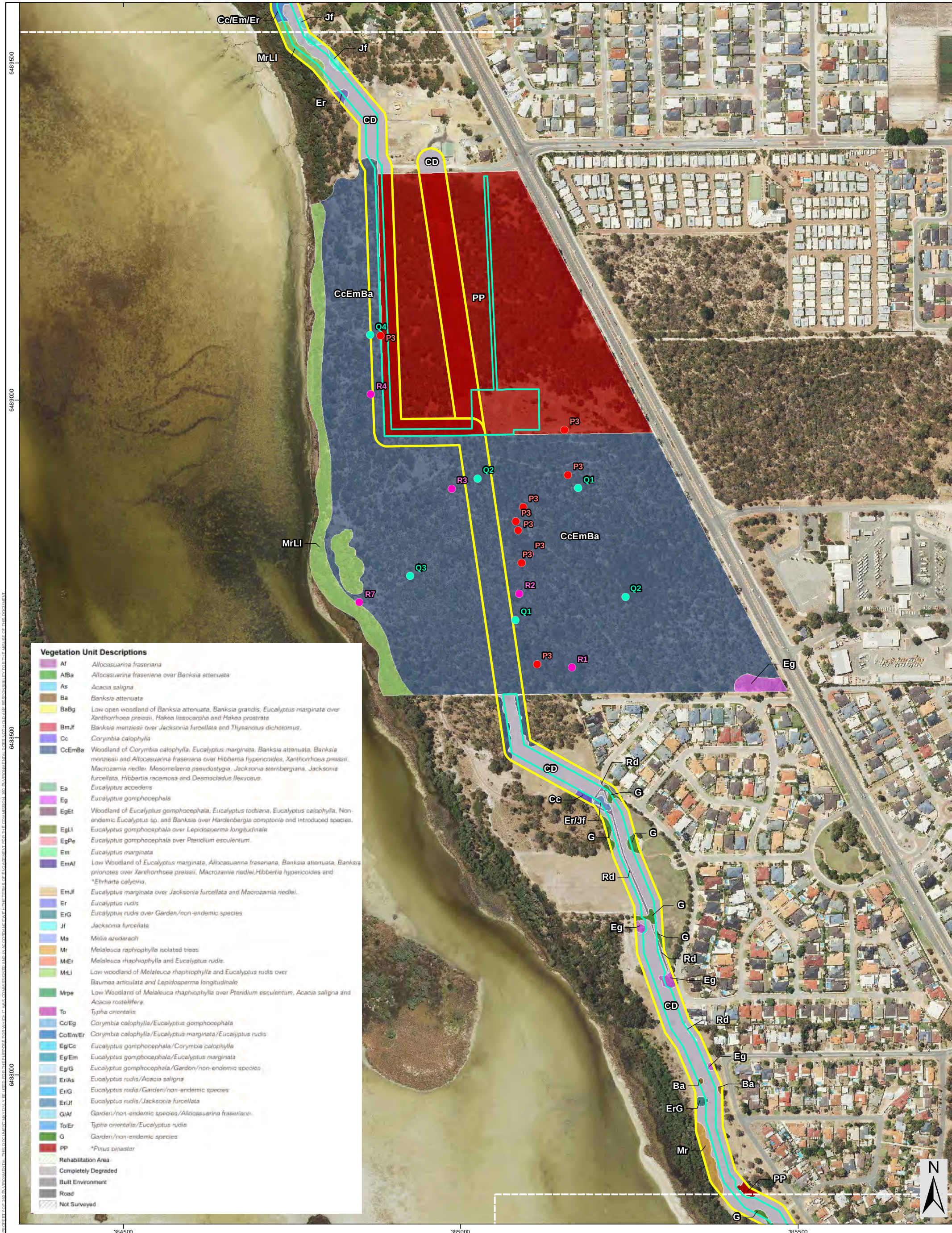
Water Corporation Groundwater Replenishment Scheme

Level 2 Flora Survey

Figure 6d

Vegetation Associations

Copyright © 2016. This document is the property of 360 Environmental. It is to be used for the purpose of the project only and is not to be reproduced or distributed without the written consent of 360 Environmental. This document may only be used for the purpose of the project only and is not to be reproduced or distributed without the written consent of 360 Environmental.



LOCALITY MAP

Legend

Development Envelope	Ba	EgLI	M	Cc/Em/Er	G
Survey Area	BaBg	EgPe	Ma	Eg/Cc	PP
Rehabilitation Area	BmJf	Em	Mr	Eg/Em	Completely Degraded
Not Surveyed	Cc	EmAf	MrEr	Eg/G	Built Environment

Vegetation Units

Af	Ea	Er	Mrpe	To	Cc/Eg
AfBa	EgLI	ErG	Ne	Cc/Eg	
As	EgEt	Jf	To		

DATA SOURCES

- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2014
- © Western Australian Land Information Authority 2015

360
environmental

a10 Berrymore St, West Leederville, 6007 WA
t (08) 9388 8360 f (08) 9381 2360
www.360environmental.com.au

people planet professional

WATER
CORPORATION

CREATED	CHECKED	APPROVED	REVISION	DATE
MH	NW	RF	0	14/10/2016

HORIZONTAL DATUM
GDA 1994 MGA Zone 50

PROJECT NO
1663

0 25 50 100 150 200 250
Meters

1:5,000 @ A3

Water Corporation Groundwater Replenishment Scheme

Level 2 Flora Survey

Figure 6e Vegetation Associations

COPYRIGHT © 2016 BY 360 ENVIRONMENTAL. THIS DOCUMENT IS THE PROPERTY OF 360 ENVIRONMENTAL. NO ENVIRONMENTAL DOES NOT HOLD ANY RESPONSIBILITY FOR THE USE OF THIS DOCUMENT.