ATTACHMENT NO. 3

Friends of Bindaring Park Bassendean

Response to Town of Bassendean on the Bindaring Wetland Concept Plan Development report compiled by COTERRA Environment (Revision 1 July 2017).

General overview

It is encouraging that concept planning has commenced, but we consider that this plan by COTERRA Environment does not go far enough to address core issues and provide a plan for the holistic repair of our degraded wetland system. Bindaring Park Wetland once received water from a greater catchment but has lost much of this fresh water source since water was diverted into the river via the Brook Street Drain. We understand there is less water flowing through the system and that the park has been filled and silted up. Given this, we would like to see an environmentally sensitive hydraulic design that allows the available water flow to support a wetland system that can function well within its urban setting, whilst being accessible to the community that manages and enjoys it, with minimal risk from the impacts of that use.

We would like a greater emphasis on the 'Living Stream'. Our comments are based on that premise.

The Friends would like to see

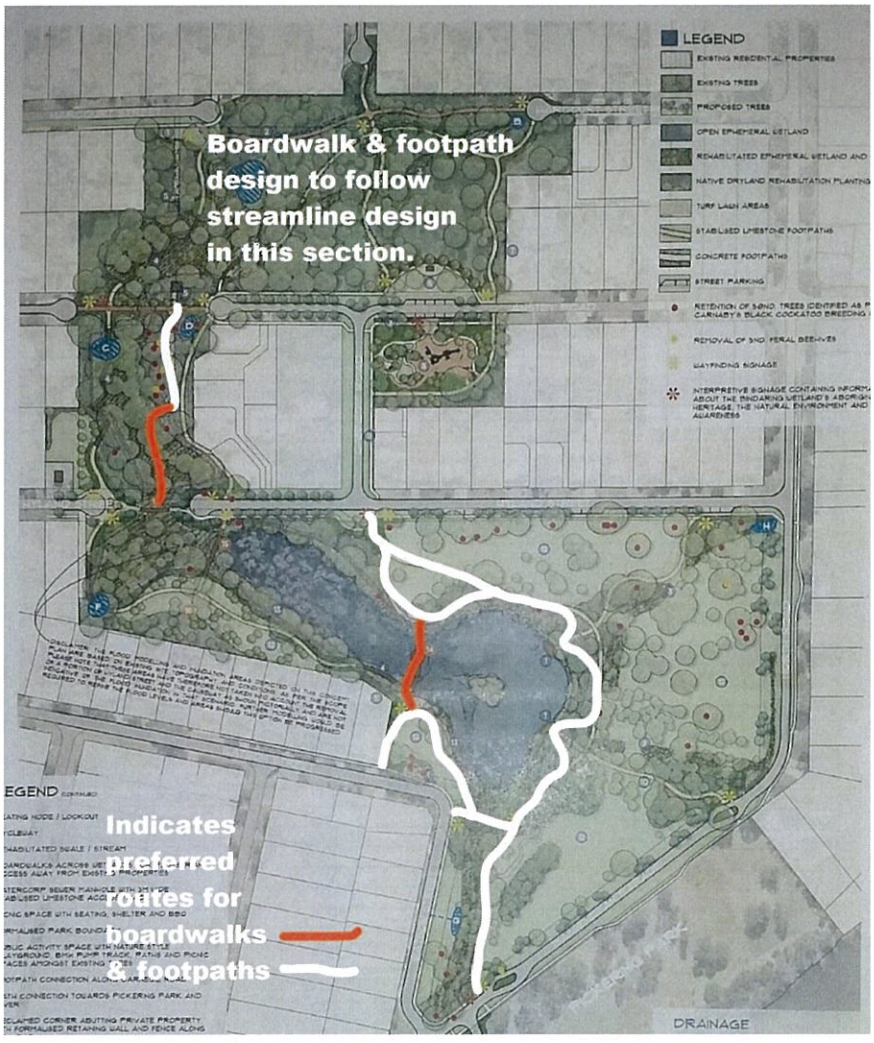
- **Hydrological/hydraulic assessments to identify the best designs to**
  - enable good water flow,
  - strip nutrients, control pollution and increase water quality in general for the benefit of the local habitat and the Swan River,
  - address the effects of saltwater incursion, and
  - facilitate management of mosquito populations by linking deeper water bodies.
  - A contour plan that shows where fill and silt will be selectively removed, with an expert explanation of how the hydraulics will work, is requested as a next step in this concept plan.

- **Greater priority given to habitat design.**
  - **Northern section** mixes people with natural areas in a way that seems to give little protective advantage to wetland fauna. We think some fill and silt removal is necessary before pathways are located and constructed. We would like to see a streamlining design for how the flow is to be directed from the inlet points, through the site to the Lovelock crossing, to eliminate isolated shallow pools that breed mosquitoes and that instead create protected areas (islands) for water birds such as Swamp Hens to return.
  - **Middle section** between Lovelock crossing and Hyland St.
    To maximise conservation opportunities and for the benefit of adjacent residents we recommend that neither of the proposed pathways be built.
    Access through this area would be better served by the construction of a boardwalk along the centre of the reserve from Hyland St as far as the sewer inspection point, then follow the proposed Water Authority access track to the end of Anstey Road.
  - **Southern Lake**
    We like the proposed boardwalk with bird hide for the access it provides to lake views and birdlife as well as creating a satisfying and functional walking circuit through this section of the park. We think this is the likely best location for a weir,

as was proposed in our earlier design and request this to be assessed in a hydrology/hydraulic report.
The weir design needs to include an adjustable gate to allow variable control of the water level as has been installed in Bayswater at the main drain adjacent to the Eric Singleton Bird Sanctuary.

- The area behind the Watson St residences that back onto the park should be set aside for conservation rather than invite public use through pathways.
- We do not favour cul-de-sac paths to points on the waters edge and prefer paths that loop in and away as being more comfortable for people to share the park, provide clearer vista, passive surveillance and deter 'antisocial' activity.
- The limestone path under the Watson St bend needs to be back as far as practical from the waters edge to maximise conservation values.
- The streamline from the southern end of the lake to Bassendean Parade seems to propose some welcome minor amendments but we are disappointed that COTERRA is silent on the environmental value of the existing weir which functions well as a footpath but has uncertain impact on management of water quality.

This map indicates the preferred routes for pathways and footpaths described above:



- **Ongoing management**
  We would like ongoing management issues to be built into the concept plan as it is developed. Fox eradication is a first step towards the return of breeding water birds and needs to be included. Weed control is also an integral part of a revegetation plan and should not be treated as a separate issue. Ideally weed and pest management should be planned to phase out the repeat application of biocides.

- **Questions for a hydraulic study**
  With respect to rising sea/river levels and the likelihood that many melaleucas are likely to have been killed by salt incursion, we were disappointed that there was no serious hydrological aspect to this report and we have questions that we think need to be answered in a subsequent study:
  - Is our existing weir in the best place and should it be higher?
  - How far up from the river should we attempt to prevent tidal inundation?
  - How can we design a way to release the salty water after tidal inundation has occurred?
  - If the melaleucas upstream of the driveway culvert are in better condition than those on the downstream side of the culvert can we improve the prospects of the downstream trees by design of a more effective and manageable weir ...
  - ...or should we let the whole lake adapt to brackish water as far as Hyland St?
  - What would the hydraulic impact of removal of a section of Hyland St and the removal of the causeway to the former private residence? These question need to be answered in tandem with questions about an effective weir design.

- **Nutrient pollution reduction**
  - Has any water monitoring been done to tell us what we are working with? The algal bloom in 2017 is the worst seen by members of the Friends group but this may have as much to do with tidal incursion of summer flooding bringing excess silt and nutrient downstream, and turf/weed management as drain inlets.
  - Design to trap and retain pollutants at the main inlet points is valuable work but we are disappointed that the report has done little to recommend how these design elements will also work to increase conservation values and habitat capacity.
  - The Floating Wetland proposal seems like a superficial gimmick as unless it is accompanied by silt removal works the structure will sit on the lake bed and the aquatic plants die off in summer.
  - Addressing behavioural education, (such as using a catcher when mowing) would be cheaper and may be more effective than the swales and floating island proposed.

We look forward to further planning and consultation that will lead to a park which is owned, embraced and protected by the community.

We request that in future staff consult with us, our Councillors and community committees before shaping future briefs for consultants and contractors to work on Bindaring Park.

Friends of Bindaring Park, Bassendean
12 January 2018

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

PARKS AND WILDLIFE SERVICE

Your ref:
Our ref: 2017/004690
Enquiries: Kate Bushby
Phone: 9278 0908
Email: kate.bushby@dbca.wa.gov.au

Mr Jeremy Walker
Senior Environmental Officer
Town of Bassendean
PO Box 87
BASSENDEAN WA 6934

Dear Mr Walker

BINDARING WETLAND CONCEPT DESIGN REVIEW

Thank you for the opportunity to review the Bindaring Wetland Concept Plan Development – Revision 1 (Coterra Environment, July 2017).

The Department of Biodiversity, Conservation and Attractions offer the following comments. Please note this advice provides the requested review of the aforementioned concept plan, but does not consider any statutory planning requirements of this proposed development. This advice can be provided if requested once a concept has been decided upon.

We are supportive of the plans to improve water quality within Bindaring Wetland through the improved treatment of urban stormwater runoff at discharge locations within the Park; improved ecological and habitat value through removal of weed vegetation, retention of high value trees and rehabilitation planting using with local native species; improved access, path connectivity and underutilised space within the park for improved recreational amenity and consider modification of hydraulic controls (e.g. removal of 'the causeway' and Hyland Street).

It is recommended that providing the space, access and fall to construct biofilters to the Adoption Guidelines for Stormwater Biofiltration Systems (CRC for WSC, 2015) specifications is sufficient and the depth below the floating wetlands is sufficient to prevent plant root growth into the base of the wetland that option 1 be preferred as it offers the greatest nutrient treatment for the least cost ($/TN and TP removal).

The possibility of constructing additional wetland areas within the public open space north of Bassendean parade if desired in future should be noted.

It is recommended that further information regarding the inputs used by Coterra in the UNDO model be obtained so the estimated treatment reduction can be verified.

If the land swap of Lot 271 Hamilton Street for Lot 27 (Lot 100) Hyland Street proceeds it is recommended that the Town of Bassendean notify the land owner of the potential for a future constructed wetland which may be built on the parkland to the west of Lot 271 Hamilton Street.

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Phone: (08) 9278 0908 Email: kate.bushby@dbca.wa.gov.au
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I trust these comments are of use. Should you require further information please contact Kate Bushby, A/Drainage and Nutrient Intervention Program Manager, on 08 9278 0908.

Yours sincerely

Peter Adkins
A/ Manager River Systems Management

13 November 2017

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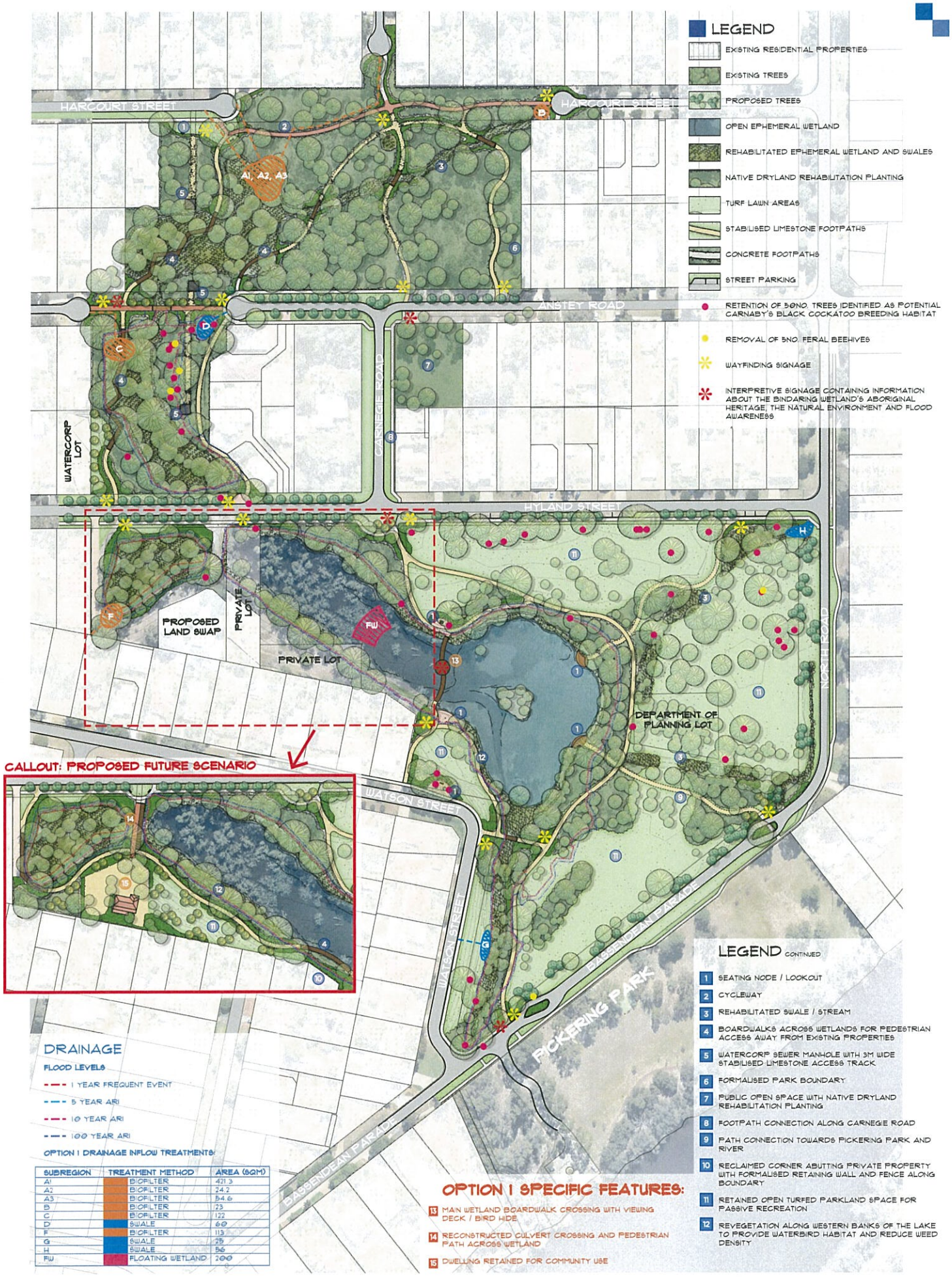

SUBREGION	TREATMENT METHOD	AREA (SQM)
A1	BIOFILTER	421.3
A2	BIOFILTER	24.2
A3	BIOFILTER	54.6
B	BIOFILTER	23
C	BIOFILTER	122
D	SWALE	60
F	BIOFILTER	113
G	SWALE	25
H	SWALE	56
FW	FLOATING WETLAND	200

LANDSCAPE CONCEPT MASTERPLAN

BINDARING WETLAND

SHEET 1 - OPTION 1 REV C

SCALE: 1:1000 @ A1 DATE: 26TH JULY 2017

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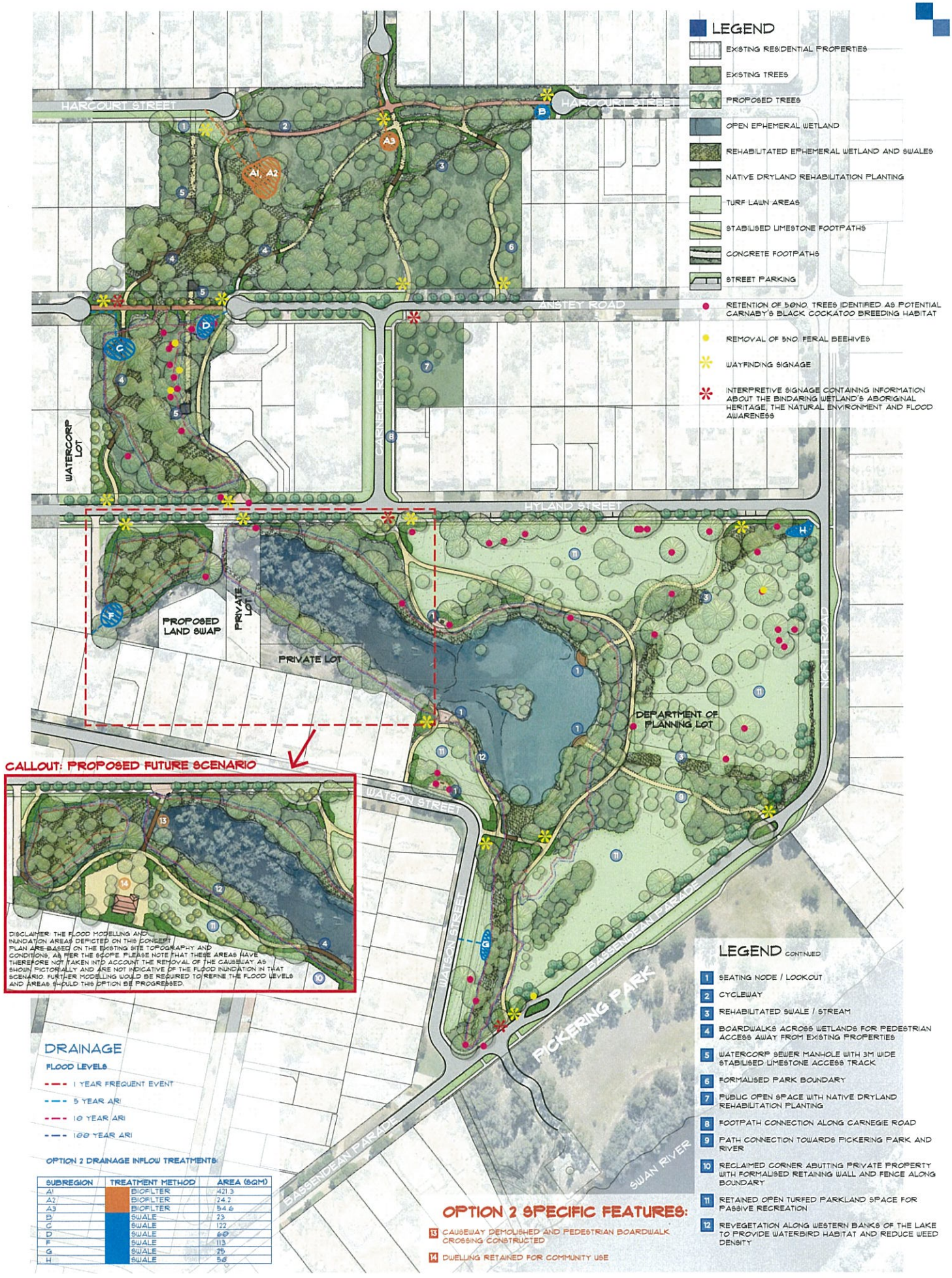

LEGEND

- EXISTING RESIDENTIAL PROPERTIES
- EXISTING TREES
- PROPOSED TREES
- OPEN EPHEMERAL WETLAND
- REHABILITATED EPHEMERAL WETLAND AND SWALES
- NATIVE DRYLAND REHABILITATION PLANTING
- TURF LAWN AREAS
- STABILISED LIMESTONE FOOTPATHS
- CONCRETE FOOTPATHS
- STREET PARKING
- RETENTION OF 5NO. TREES IDENTIFIED AS POTENTIAL CARNABY'S BLACK COCKATOO BREEDING HABITAT
- REMOVAL OF 5NO. FERAL BEEHIVES
- WAYFINDING SIGNAGE
- INTERPRETIVE SIGNAGE CONTAINING INFORMATION ABOUT THE BINDARING WETLAND'S ABORIGINAL HERITAGE, THE NATURAL ENVIRONMENT AND FLOOD AWARENESS

DRAINAGE

FLOOD LEVELS

- 1 YEAR FREQUENT EVENT
- 5 YEAR ARI
- 10 YEAR ARI
- 100 YEAR ARI

OPTION 2 DRAINAGE INFLOW TREATMENTS

SUBREGION	TREATMENT METHOD	AREA (SQM)
A1	BIOFILTER	421.3
A2	BIOFILTER	24.2
A3	BIOFILTER	54.6
B	SWALE	23
C	SWALE	122
D	SWALE	60
F	SWALE	113
G	SWALE	25
H	SWALE	58

LEGEND CONTINUED

1. SEATING NODE / LOOKOUT
2. CYCLEWAY
3. REHABILITATED SWALE / STREAM
4. BOARDWALKS ACROSS WETLANDS FOR PEDESTRIAN ACCESS AWAY FROM EXISTING PROPERTIES
5. WATERCORP SEWER MANHOLE WITH 3M WIDE STABILISED LIMESTONE ACCESS TRACK
6. FORMALISED PARK BOUNDARY
7. PUBLIC OPEN SPACE WITH NATIVE DRYLAND REHABILITATION PLANTING
8. FOOTPATH CONNECTION ALONG CARNEGIE ROAD
9. PATH CONNECTION TOWARDS PICKERING PARK AND RIVER
10. RECLAIMED CORNER ABUTTING PRIVATE PROPERTY WITH FORMALISED RETAINING WALL AND FENCE ALONG BOUNDARY
11. RETAINED OPEN TURFED PARKLAND SPACE FOR PASSIVE RECREATION
12. REVEGETATION ALONG WESTERN BANKS OF THE LAKE TO PROVIDE WATERBIRD HABITAT AND REDUCE WEED DENSITY

OPTION 2 SPECIFIC FEATURES:

13. CAUSEWAY DEMOLISHED AND PEDESTRIAN BOARDWALK CROSSING CONSTRUCTED
14. DWELLING RETAINED FOR COMMUNITY USE

LANDSCAPE CONCEPT MASTERPLAN

BINDARING WETLAND

SHEET 1 - OPTION 2 REV C

SCALE: 1:1000 @ A1 DATE: 26TH JULY 2017

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DISCLAIMER: THE FLOOD MODELLING AND INUNDATION AREAS DEPICTED ON THIS CONCEPT PLAN ARE BASED ON EXISTING SITE TOPOGRAPHY AND CONDITIONS. AS PER THE SCOPE PLEASE NOTE THAT THESE AREAS HAVE THEREFORE NOT TAKEN INTO ACCOUNT THE REMOVAL OF A PORTION OF HYLAND STREET AND THE CAUSEWAY AS SHOWN PICTORIALLY AND ARE NOT INDICATIVE OF THE FLOOD INUNDATION IN THAT SCENARIO. FURTHER MODELLING WOULD BE REQUIRED TO REFINE THE FLOOD LEVELS AND AREAS SHOULD THIS OPTION BE PROGRESSED.

DRAINAGE

FLOOD LEVELS

- 1 YEAR FREQUENT EVENT
- 5 YEAR ARI
- 10 YEAR ARI
- 100 YEAR ARI

OPTION 3 DRAINAGE INFLOW TREATMENTS:

SUBREGION	TREATMENT METHOD	AREA (SQM)
A1	SWALE	421.3
A2	SWALE	24.2
A3	SWALE	54.6
B	SWALE	23
C	SWALE	122
D	SWALE	60
F	SWALE	113
G	SWALE	25
H	SWALE	56

OPTION 3 SPECIFIC FEATURES:

13. MAIN WETLAND BOARDWALK CROSSING WITH VIEWING DECK / BIRD HIDE
14. CAUSEWAY DEMOLISHED AND PEDESTRIAN BOARDWALK CROSSING CONSTRUCTED
15. DWELLING DEMOLISHED TO CREATE PUBLIC PARKLAND SPACE EXPLOITING NORTHERLY ASPECT
16. HYLAND STREET CLOSED OFF IN CUL-DE-SAC FORMATION. PEDESTRIAN PATH AND BOARDWALK CONSTRUCTED ACROSS RESTORED WETLAND

LEGEND CONTINUED

1. SEATING NODE / LOOKOUT
2. CYCLEWAY
3. REHABILITATED SWALE / STREAM
4. BOARDWALKS ACROSS WETLANDS FOR PEDESTRIAN ACCESS AWAY FROM EXISTING PROPERTIES
5. WATERCORP SEWER MANHOLE WITH 3M WIDE STABILISED LIMESTONE ACCESS TRACK
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LANDSCAPE CONCEPT MASTERPLAN

BINDARING WETLAND

SHEET 1 - OPTION 3 REV C

SCALE: 1:1000 @ A1 DATE: 26TH JULY 2017

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