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# Bindaring Park

## Concept Plan Development

2<sup>nd</sup> August 2017

Presentation by  
Coterra Environment and  
EPCAD



# Background

- *TOB seek to improve ecological and recreational value of Bindaring Park*
- *Coterra and sub-consultants: technical studies and develop 3 concept designs*



# Technical Studies



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## *Previous Studies (by others)*

1. *Desktop Environmental Assessment*
2. *Weed Management Plan*
3. *Survey and flood modelling (northern zone)*
4. *Preliminary Acid Sulphate Soils*
5. *Drainage Network modelling*

## *This Study (Coterra and sub-consultants)*

1. *Survey and flood modelling (middle and southern zones)*
2. *UNDO (water quality) modelling*
3. *Targeted Acid Sulfate Soils Investigation*
4. *Geotechnical Investigation*
5. *Fauna Assessment*



# Objectives



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- 1. Improve water quality through improved treatment of urban stormwater runoff at stormwater discharge locations within the park.*
- 2. Improve ecological and habitat value through removal of weeds, and rehabilitation planting using local native species.*
- 3. Improve access, path connectivity, and underutilised space within the park for improved recreational amenity.*
- 4. Consider possible future options on the modification of hydraulic controls such as 'the causeway' and Hyland Street.*



# Concept Design - Option 1

Objective	Measures proposed
Improve quality of stormwater discharged to wetland	4 biofilters (major inflows) 3 swales (minor inflows) Floating wetland Gross pollutant trap
Improve ecological and habitat value	Extensive weed control Rehabilitation planting Retain 50 black cockatoo habitat trees Remove 5 feral beehives
Improve recreational amenity	Additional paths, boardwalks, bird hide Passive recreation areas including seating and lookouts <i>Optional: Use house on 27 Hyland St as environment/community house.</i>
Consider hydraulic controls	No changes proposed







# Concept Design - Option 2

Objective	Measures proposed
Improve quality of stormwater discharged to wetland	2 biofilters (main inflows) 6 swales (minor inflows) Gross pollutant trap
Improve ecological and habitat value	Extensive weed control Rehabilitation planting Retain 50 black cockatoo habitat trees Remove 5 feral beehives
Improve recreational amenity	Additional paths, boardwalks, passive recreation areas including seating and lookouts <i>Optional: Remove causeway and replace with pedestrian boardwalk</i>
Consider hydraulic controls	<i>Optional: Removal of the causeway</i>



# 2



## 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 (SQFT)
A1	BIOFILTER	471.3
A2	BIOFILTER	24.2
A3	BIOFILTER	84.6
B	SWALE	73
C	SWALE	673
D	SWALE	113
E	SWALE	75
F	SWALE	86
G	SWALE	
H	SWALE	

### CALLOUT: PROPOSED FUTURE SCENARIO



DISCLAIMER: THE FLOOD MODELING AND FLOOD RISK ANALYSIS SHOWN ON THIS PLAN ARE BASED ON THE EXISTING SITE TOPOGRAPHY AND CONDITIONS AS TAKEN INTO ACCOUNT. THEREFORE, NOT TAKEN INTO ACCOUNT THE REMOVAL OF THE CAUSEWAY AS SHOWN. FURTHER MODELING WOULD BE REQUIRED TO REFINE THE FLOOD LEVELS AND AREAS SHOULD THIS OPTION BE PROGRESSED.

## 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 SUNK TREES IDENTIFIED AS POTENTIAL CARRADAY'S BLACK COCKATOO BREEDING HABITAT
- REMOVAL OF SUNK PERAL BEEVES
- WAFENDING SIGNAGE
- INTERPRETIVE SIGNAGE CONTAINING INFORMATION ABOUT THE LANDSCAPE AND HERITAGE OF THE NATURAL ENVIRONMENT AND FLOOD AWARENESS

## 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 CARRIEGE 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 WATERBED HABITAT AND REDUCE WEED DENSITY

## OPTION 2 SPECIFIC FEATURES:

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



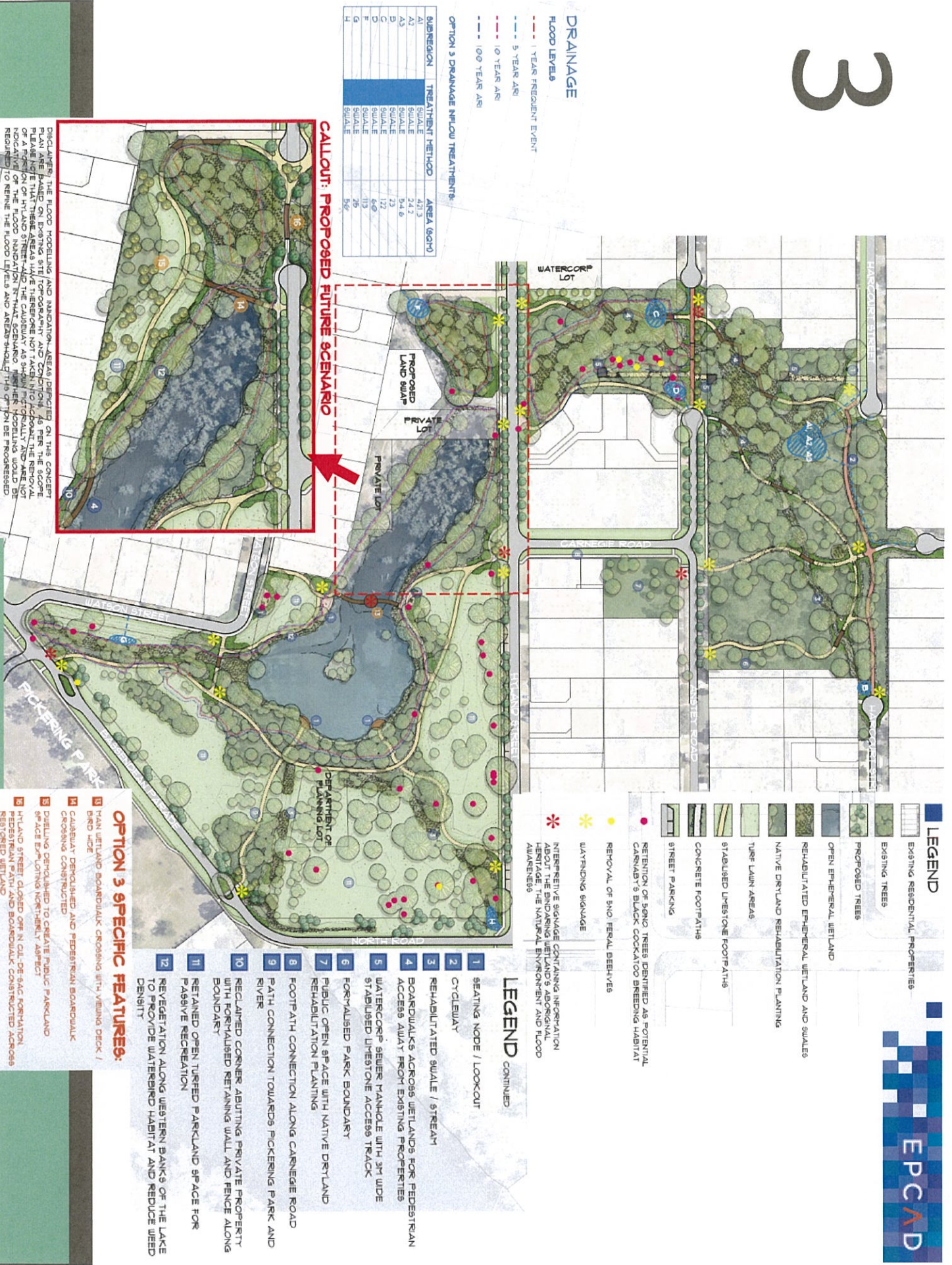


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# Concept Design - Option 3

Objective	Measures proposed
Improve quality of stormwater discharged to wetland	7 swales (all inflows) Gross pollutant trap
Improve ecological and habitat value	Extensive weed control Rehabilitation planting Retain 50 black cockatoo habitat trees Remove 5 feral beehives
Improve recreational amenity	Additional paths, boardwalks, bird hide Passive recreation areas including seating and lookouts <i>Optional: Remove house on 27 Hyland St and reclaim land as POS</i>
Consider hydraulic controls	<i>Optional: Removal of the causeway and Hyland Street</i>





### DRAINAGE

- FLOOD LEVELS**
- 1 YEAR FREQUENT EVENT
  - 5 YEAR ARI
  - 10 YEAR ARI
  - 100 YEAR ARI

### OPTION 3 DRAINAGE WETLAND TREATMENT:

SUBREGION	TREATMENT METHOD	AREA (SQM)
A1	SUWALE	43.3
A2	SUWALE	24.2
A3	SUWALE	54.6
B	SUWALE	23
C	SUWALE	127
D	SUWALE	60
E	SUWALE	113
F	SUWALE	20
H	SUWALE	50

### CALLOUT: PROPOSED FUTURE SCENARIO

DISCLAIMER: THE FLOOD MODELLING AND INDICATION AREAS DEPICTED ON THIS CONCEPT PLAN ARE BASED ON EXISTING SITE TOPOGRAPHY AND CONDITIONS. AS PER THE GEOTECHNICAL REPORT, THE FLOOD MODELLING AND INDICATION AREAS DEPICTED ON THIS CONCEPT PLAN ARE NOT INDICATIVE OF THE FLOOD INDICATION THAT WOULD BE REQUIRED TO REFINE THE FLOOD LEVELS AND AREAS SHOULD THIS OPTION BE PROGRESSED.

### LEGEND

- EXISTING RESIDENTIAL PROPERTIES
- EXISTING TREES
- PROPOSED TREES
- OPEN EPHEMERAL WETLAND
- REHABILITATED EPHEMERAL WETLAND AND SWALES
- NATIVE DRYLAND REHABILITATION PLANTING
- TURF LAWN AREAS
- STABILISED LITESTONE FOOTPATHS
- CONCRETE FOOTPATHS
- STREET PARKING
- RETENTION OF BOND TREES IDENTIFIED AS POTENTIAL CANARYB'S BLACK COCKATOO BREEDING HABITAT
- REMOVAL OF BOND FERAL BEEHIVES
- WATERING SIGNAGE
- INTERPRETIVE SIGNAGE CONTAINING INFORMATION ABOUT THE ENDANGERED WETLAND'S ABORIGINAL HERITAGE, THE NATURAL ENVIRONMENT AND FLOOD ADVISORIES

### 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 LITESTONE ACCESS TRACK
- 6 FORMALISED PARK BOUNDARY
- 7 PUBLIC OPEN SPACE WITH NATIVE DRYLAND REHABILITATION PLANTING
- 8 FOOTPATH CONNECTION ALONG CARNegie ROAD RIVER
- 9 PATH CONNECTION TOWARDS PICKERING PARK AND RIVER
- 10 RECLAIMED CORNER ADJUTING 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 3 SPECIFIC FEATURES:

- 13 MAIN WETLAND BOARDWALK CROSSING WITH VIEWING DECK / BIRD HIDE
- 14 CASHEMAT DECKED AND PEDESTRIAN BOARDWALK CROSSING CONSTRUCTED
- 15 DWELLING DEMOLISHED TO CREATE PUBLIC PARKLAND SPACE EXPLOITING NORTHERLY ASPECT
- 16 HIGHLAND STREET CLOSED OFF N. END OF 95% REMOVAL AND BOARDWALK CONSTRUCTED ACROSS RESTORED WETLAND





# Water Quality Treatment Effectiveness

Option	Treatment method	Nutrient export (kg/ha/yr)		
		N	P	
Existing	No treatment	1.70	0.19	
Option	Treatment method	Total nutrient removed (kg/ha/yr)		Rank (most effective to least)
		N	P	
1	4 biofilters 3 swales Floating wetland, GPT	0.86	0.08	1
2	2 biofilters 6 swales, GPT	0.56	0.05	2
3	7 swales, GPT	0.27	0.01	3





# Indicative Cost

Option	Indicative cost (millions) (Incl.GST)
1	1.64
2	1.40
3	1.45

**Exclusions:**

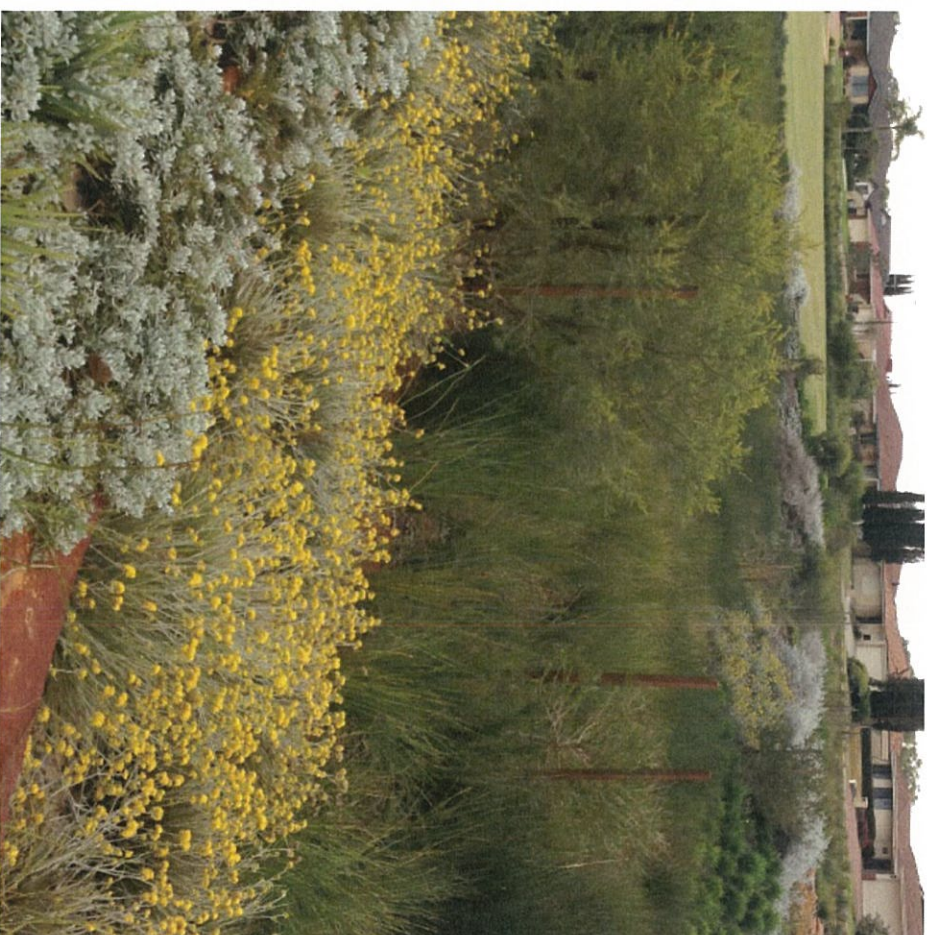
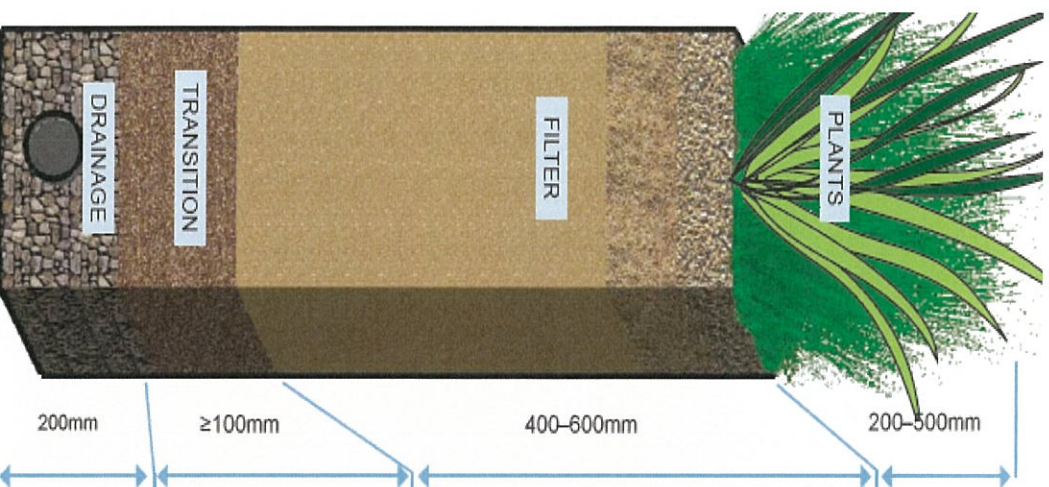
- Removal of causeway or dwellings
- Modification of Hyland Street
- Civil services/drainage other than water quality treatment
- Maintenance
- Pest Control
- Design and consultancy fees including further approvals and investigations

*See report for full list of exclusions*



# Biofilter

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# Swale



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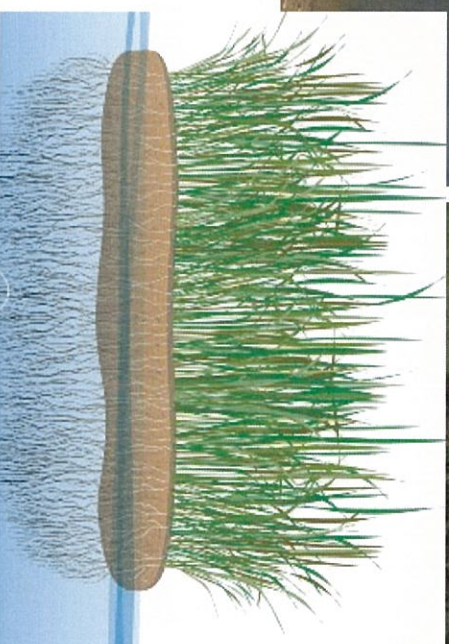
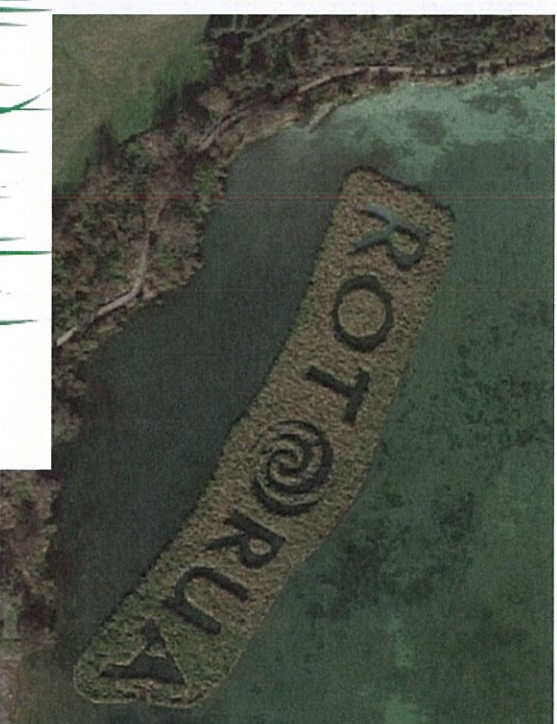






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# Floating Wetland





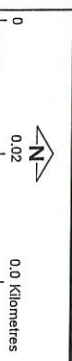
- Legend**
- Local Government Area
  - Cadastre (View 1)



# PlanViewWMA Map

**INTERNAL USE ONLY**

Internal Spatial Viewer  
[Link to website](#)



1 : 978  
 at A3

Projection: MGS 1994 Web Mercator Auxiliary Sphere

**Notes:**

The data that appears on the map may be out of date. It is the user's responsibility to ensure the scale, display, or subject to the relevant layers metadata. For these reasons the map should not be distributed outside of the Department.  
 Map was produced using DPLH's PlanViewWMA.

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 Date produced: 31-Jul-2017