

# Urban Wetlands

## Riverhaven Estate, West Martin

Land use / development type	Scale
Residential development	Residential lot
Public open space	Precinct
Foreshore rehabilitation	Precinct

Stormwater controls	Scale
Soakwells	Lot
Rain gardens	Street
Dry detention basins	Precinct
Living Stream	Precinct
Waterwise landscaping	Structure Plan
Retention of native vegetation	Structure Plan

Efficient use of water	Scale
Water efficient fixtures and fittings	Lot
Water efficient fixtures and fittings	Lot
Waterwise front yard landscaping packages	Lot
Bore to irrigate POS	Precinct
Self-sustaining foreshore rehabilitation	Precinct
Waterwise landscaping	Structure Plan

Water reuse	Scale
n/a	

Site conditions	
Soils	Sandy clay
Groundwater	At surface to <5m
Slope	<10% with steep drop off to Canning River

Local government	Location
City of Gosnells	Martin

The Riverhaven Estate is a unique housing development located beside the Canning River in Martin. The development was project managed by Primewest and has been designed in accord with the site's natural surrounds. The 10.5 ha development includes 108 residential lots ranging in size from 390 m<sup>2</sup> to 803 m<sup>2</sup>.

The site has historically been used as an equestrian training and agistment facility and was predominately cleared of native vegetation. Three drainage lines existed within the site and a larger drainage channel was

located outside the sites south eastern boundary. The Canning River is located along the southern boundary and an unnamed tributary of the Canning River is located along the north western boundary.

All drainage channels conveyed untreated stormwater from the upstream road and semi-rural catchment directly to the Canning River.

In developing the Local Structure Plan for Riverhaven, the Swan River Trust agreed to consider the proposal to allow stormwater infrastructure being located outside the development boundary and in the publically owned Canning River foreshore reserve, if an improvement in water quality entering the Canning River from inside and outside the development could be demonstrated.

The drainage system design therefore included removing the drainage lines within the site discharging to the Canning River, streamlining the drainage channel located outside the site to the south-east into a living stream and revegetating the Canning River foreshore and Canning River tributary.

In addition, the stormwater management strategy for the Estate was required to incorporate urban water best practice throughout, including the use of bio-filtration swales and the use of native vegetation and soil amendments in drainage basins to encourage at-source infiltration of stormwater and water quality treatment.

Providing drainage infrastructure in the foreshore reserve not only presented an opportunity to improve water quality but also the ecological health of the foreshore area.

The net result is an improvement to the overall ecological value of the surrounding foreshore areas relative to the previously degraded status and improved treatment of stormwater prior to entering the Canning River.

### Key Project Features

- Stormwater treatment has been incorporated into the landscaped environment through the use of large bio-filtration basins, vegetated swales and rain gardens.
- Road run-off during the 1 year Average Recurrence Interval (ARI) event is infiltrated through the use of rain gardens in the road reserve.
- Rainfall events greater than the 5 year ARI to 100 year ARI events are conveyed and retained through the road network within each catchment to the bio-retention basins located in the foreshore.
- Waterwise landscaping in all front yards of private dwellings and public open spaces.
- 0.9 ha of the Canning River foreshore and unnamed tributary have been revegetated with local native plant species to improve the vegetation condition, diversity, habitat value, erosion control and aesthetics of the area.
- Streamlining of the existing drainage channel located outside the south eastern boundary to improve the quality of stormwater entering the Canning River
- Reduced impact of degrading processes on the foreshore reserve including significant erosion, weed invasion, loss of vegetation and human disturbance.
- Provision of suitable areas for passive and active recreational activities and controlled public access adjacent to the river's foreshore.
- Monitoring of the success of revegetation measures within the foreshore reserve.



### Development Costs<sup>1</sup>

	Civil costs	Landscaping costs
Rain garden - located in road reserve	\$140/m <sup>2</sup>	\$19.80 per m <sup>2</sup>
Revegetation of foreshore & drainage basins	\$20 per m <sup>2</sup>	\$9.90 per m <sup>2</sup>
Bio retention Basin	\$81 per m <sup>2</sup>	\$11.55 per m <sup>2</sup>
Rock Pitched Swale	\$90 per m <sup>2</sup>	\$16.00 per m <sup>2</sup>
Vegetated Swale	\$65 per m <sup>2</sup>	\$12.40 per m <sup>2</sup>
Sub soil drainage	Approx \$105/m <sup>2</sup>	--

### Maintenance Costs<sup>1</sup>

Foreshore & Drainage maintenance (total area: 20,570m <sup>2</sup> )	\$58,500 for two years
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<sup>1</sup>All Costs are site specific and are an approximation given for guidance purposes only

### Issues & challenges

As the drainage design of the development included the installation of drainage infrastructure and revegetation works within the Swan Canning Development Control Area (DCA), the developer was required to seek planning approval as required under Part 5 of the Swan and Canning Rivers Management Act 2006. The Minister for Environment is responsible for approving development and works undertaken within the DCA,

which includes all public lands adjoining the rivers. The foreshore land is owned by the Western Australian Planning Commission (WAPC) and mapped as a Bush Forever site adding to the sensitivity of the area.

An Urban Water Management Plan (UWMP) and an Acid Sulfate Soils and Dewatering Management Plan (ASDMP) needed to be completed and endorsed by the relevant authorities including the City of Gosnells, Department of Water

and the Swan River Trust (SRT). These plans were submitted along with an early version of a Foreshore Management Plan with the Part 5 application which was lodged with the SRT. Conditional approval to complete the proposed foreshore rehabilitation and drainage design works was provided with the final approval received in 2014.

The sensitivities of the site and the fact that it was public lands meant that detailed information

had to be provided earlier in the process than is usually required for projects which contain all infrastructure on site. This added risk and costs to the land development project. Proponents are advised to seek early advice on any proposed works within public reserves or the DCA well in advance to ensure appropriate planning can occur. The approvals process for the Minister is now administered by the Department of Parks and Wildlife rather than the Trust.



### Outcomes

The Riverhaven Estate is a prime example of the benefits which can be achieved when residential development considers the total water cycle early in the development of the Local Structure Plan. The improvements in water quality

and ecological benefits at the site are significant.

The Riverhaven Estate is an excellent example of the works which can be achieved if water sensitive drainage design options are considered and regulators and developers work

in partnership. Allowing the drainage basins to be located in the foreshore of the Canning River has significantly improved the ecological value of the area, prevented untreated stormwater from being discharged to the Canning River and provided residents with

fantastic useable active public open space within the Estate and further passive recreational options along the Canning River foreshore.

March 2017

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