

Echuca Aquatic Reserve Infrastructure and Service Plan

Produced for

the Shire of Campaspe

by

Liesl Malan Landscape Architects

in collaboration with

Heil Engineering Consultants

August 2015

Project Team

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Liesl Malan

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Liesl Malan Landscape Architects were the lead consultants providing strategic direction for the project

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> Acknowledgement of Country We acknowledge the Elders both past, present and future and the peoples of the Yorta Yorta Nations and the Wollithica people whose traditional lands include the Echuca Aquatic Reserve.



Heil Engineering Consultants provided Engineering input and led the team on proposed water quality improvements

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The Shire of Campaspe set the brief, provided project direction, undertook internal and external liaison and contributed to the spreadsheet data and service limits

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Shire of Campaspe Project Reference Group:



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Executive Summary

The Echuca Aquatic Reserve Infrastructure and Service Plan provides the vision, principles and project outcomes to maximise the potential of the site and its impact environmentally, economically and socially. The project outcomes align with the Campaspe Open Space Strategy (prepared by Spiire and Public Place in December 2014) and more specifically, the following strategic direction set by that document:

- **Developing Effective Policy and Planning Mechanisms**
 - Develop an internal Open Space Planning Mechanism
- Improving the Quality of and Access to Open Space
 - **Equitable Access** ٠
- Supporting walking and cycling in open space
- Developing a Sustainable Open Space System
 - **Economically Sustainable Open Space**
 - **Environmentally Sustainable Open Space**
- Promoting Open Space and Activity Within Open Space
 - Improved social connection through creating meeting spaces.
- Improved economic outcomes through improving liveability and creating spaces for outdoor activities and events.
- Protection of natural environment, with positive impacts on pollution abatement, global warming, flora and fauna diversity and protection.

The Echuca Moama Recreation Plan (prepared for Campaspe Shire Council & Murray Shire Council by Stratcorp Consulting • Pty Ltd, 2006) provides an excellent summary of the use of Public Open Space in the Echuca Moama region. Half of all people surveyed (51%) regularly visit a park. The most common reason for visiting was a family outing (51%), followed by playground use (or supervising) (44%), BBQ/picnic (33%), and walking/jogging for exercise (28%). Walking (56%) was the most popular activity recreation activity found by the survey. The report further speculated that due to the aging population trends, there will be an increase in "demand for unstructured and passive leisure and recreation pursuits." The Echuca Aquatic Reserve, despite it close proximity to the CBD and key attractions, was found to be visited by a low percentage (3%) of the surveyed population.

This data shows that the surveyed population has an existing culture of using Public Open Space for passive recreational pursuits, however, the Aquatic Reserve is not being used to its full potential. Identified key deterrents to the use of the site include access and facilities. The recommendations in this report seek to address these key issues and increase casual user numbers.

The Echuca Aquatic Reserve (Aquatic Reserve) is well loved. It is cherished for its manicured nature, where infrastructure is unobtrusive and the qualities of passive open space can be enjoyed without distraction. During consultation with Council officers and stakeholders the repeated theme was 'don't change it, keep it natural, we love it the way it is.' Core issues such as low water quality, high maintenance requirements, inadequate Access for All Abilities and event requirements could have resulted in a proposal for large infrastructure or significant site changes. This Infrastructure and Service Plan however, addresses the issues by providing low key, subtle and at times invisible, interventions to ensure the key site qualities remain and are enhanced.

This report recommends the following: Short Term

- Undertake a Levee Study to determine the future of the levee
- Regrade the top of levee and install a new path to limit risks to the public
- Design, document and construct grassed ramps to provide two points of access to the base of the site
- Rebuild swale crossings. Address the middle crossing as a priority to limit the risk to the public
- Design and construct an irrigation system to reduce the ongoing maintenance hours
- **Develop a Tree Management Masterplan**
- Undertake a review of the existing drainage system and the prepare a Storm Water Management Plan to improve the water quality and wetland function
- Provide pools and instream meanders in the existing swales and ensure a diverse range of indigenous riverine plants are installed and maintained
- Provide improved access over the replica Railway lines by installing paved crossings between the lines at key points.
- Invest in facilities which support events for locals and visitors and increase event viability by reducing the running costs for event managers
- Install additional town water taps and three phase electricity points. Review the size of the existing diameter of the water connection to ensure adequate water pressure
- Provide a plan locating all services (water, irrigation, power and drainage) for all events.
- Establish marquee points to cater for different sized marquees
- Install a toilet, drinking fountain and bike parking
- Design and construct low level site lighting Medium Term
- Develop a landscape plan for the Council and Court House forecourt area
- Explore the opportunities to develop a contemporary interactive trail of Wollithica history and culture which provides a dynamic visitor experience.
- Develop a play space concept which includes some water play element(s) Long term opportunities have been identified in the future for
- The Visitor Information Centre / Pump House could have the principles of 'Geotourism' applied to support an integrated tourism response in conjunction with the Discovery Centre
- The Replica Railway could benefit from a business plan



Introduction

Echuca Aquatic Reserve is a treasured and dynamic space in the heart of the Echuca CBD on the Murray River.

As it exists today, the space is almost completely man made. In the 1970's a levee was created to protect the site from flood. It provides protection against the 10% flood level from the Murray River. The levee makes a significant contribution to the site and provides a unique 'natural' amphitheatre in the context of the Murray River. Historically the site was swamp land, now there is a water body which is connected to the stormwater drain of a significant portion of Echuca's roads. The water body was designed as a wetland but this is not functioning and the water quality is low with regular algae blooms. Even with these significant changes to the landform and environmental function, the Echuca Aquatic Reserve is prized for its natural feeling and successfully provides a curated river environment.

The Council Works Team are managing and maintaining the site to promote a manicured natural feeling. The high quality of maintenance has lead to this amphitheatre being home to major events including the Riverboats Music Festival and Carols by Candlelight. The man hours being invested into the site are high and the events are currently not charged a venue fee.

Access down the steep and grassy slopes to the heart of the site does not provide for All Abilities Access and after rain events these slopes are hazardous to even the most able bodies. The natural ambience of the site means both Council and the community oppose large and intrusive site interventions.

To inform all of the proposals for Aquatic Reserve the project Team and the Project Reference Group developed the following guiding principles:



Guiding Principles



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Support the dynamic nature of this site Support the site as a space for events of as a high profile Passive Open Space, a varying scales high profile open space for tourism, Community event space and minor Active Open Space

Funding of Works

Due to the potential positive impacts of works to stimulate additional visitation to Echuca through more events, there is expected to be a reasonably positive flow on effect to the regional economy. It therefore probable that State and Federal funding may be sourced to assist with the funding of proposed works. A more detailed business case and analysis of the economic benefit of the works would be required if a suitable funding program is identified.

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Guiding principles



All proposals must consider the impact on available maintenance resources





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Note

Echuca Aquatic Reserve Site Analysis Plan Shire of Campaspe

Legend

Access Hazards

Slip hazard which could result in serious injury

Direct access to deep water hazard which could result in serious injury

Localised grading causing difficult access

Trip hazard which could result in serious injury

Areas blocking or causing difficult access

Areas blocking or causing difficult access which may result in injury

Wetland

"The Lake" Open water body has frequent blue green algae blooms

Wetland swale Water is not flowing through these as intended in the original concept

Water flow over weir

Water movement in wetland swale

Pipe to next wetland cell Water is currently not flowing

Pipe from town storm water system to wetland

Open swale over flow to Murray River operates during storm events

General Pedestrian / cyclist path or access over grass

Views

Existing trees

Visitor information Centre (Outside of project brief)

Underwater viewing platform Disused due to Confined Space not meeting regulations

RBMF = River boats Music Festival

Wetland Function Analysis is based on the Parsons Brinckerhoff Functional Design Layout Plans 2005



Riverboats Music Festival

Main entry during events

Festival boundary

Festival fence

Stage

The pit Standing viewing of artists, dancing and moshing

Seating area Plastic chairs supplied by organiser The green tent - artist / performer private space

Picnic space Flatter ground with some tables supplied, but mostly patrons on picnic rugs

Levee slope sitting Patrons with picnic rugs using the slope as a natural amphitheatre

Top of levee sitting with patrons own deck chairs. Provides easy access if patron doesn't want to / can't walk down the slope Food Merchandise and Alcohol

Bins and skips

Car parking

First Aide

Drinking water station

Scale: 1:750 @ A1 Date : 20.07.2015

Liesl Malan





Echuca Aquatic Reserve Infrastructure and Service Concept Diagram Shire of Campaspe

Legend

Water improvements

Proposed circulation pump to ensure water circulation and improve water quality Proposed improved water flow in wetland

Existing connecting pipes to be cleaned to ensure water flow Existing weirs to be modified to ensure water flow and provide additional hydraulic head within sediment pond

Area to be utilised for water aeration

Proposed riparian planting to swale and safety batter to improve safety by limiting direct access water by children and provide improved habitat for wild life

10% flood level

Note Holistic overall Stormwater Management Plan required.

Access improvements

Proposed grassed ramp to provide improved pedestrian and approved vehicular access at a manageable and safer grade

provide safer use of ramps at night

Proposed new bridge crossing to improve access to the site and engagement with the wetland

Proposed path connection

Proposed public toilets located above the 10% flood level. To meet the needs of the bike path users, and potentially extend the length of stay by the general public. In addition it will support events located near the grassed ramps. A discharge point for the sewerage from a toilet trucks could be included to support larger events.

Proposed bike rack

Maintenance and Management

A Tree Management Masterplan is needed and it should view the trees both as individual trees with specific issues and also take a holistic view of their contribution and impact on this site and to the environment generally.

Existing pump for irrigation. Provide a permanent irrigation system to use wetland water body as a water source. Consider the life span of the existing pump and capacity.







Proposed potable water connection to support catering during events

Proposed phase 3 electrical connection to support catering during events Proposed anchor points for small marquees to limit potential damage to proposed irrigation system

Proposed anchor points for large marquees to limit potential damage to proposed irrigation system

Proposed fitting for temporary lighting associated with events eg paper lanterns to limit potential damage to proposed irrigation system. Fitting is likely to be similar to removable bollards.

Proposed location of temporary event box office

Locals and tourist activities



Proposed Wollithica Trail The proposed trail is to be developed as a contemporary interactive trail which provides a dynamic visitor experience for locals and visitors. The concept of the trail is to promote, preserve and reveal, the largely untold story of the local Wollithica people.

The concept development will need to connect to the site context and the existing tourism support system. Note exact alignment subject to future concept



Proposed children's play space for locals and tourists. If is intended that this play space is a bookend to the Foreshore development. The concept develop a "river experience" accessible for children as an iconic play attraction in the region. It is proposed that the form and execution should reflect the natural environment and provide a nature based play opportunity with a water component

This area has a rich Yorta Yorta Nation History. Water is central to traditional life and there is the opportunity to showcase the river based culture. Scale: Not To Scale

Date : 20.07.2015







Proposed bollard style lighting to



Issues & recommendations table

	Issue	Affect	General recommendation	De
	Wetland is not functioning as intended	Causes increased maintenance hours to address issues	Undertake a Storm Water Management Plan with a wetland functional layout	Site
	Water quality is low	Blue green algae blooms are frequent		A c dise
		Deters events due to public safety concerns and unpleasant smell		Rai
Wetland	There is unsafe access to open water			The
	Limited diversity of habitat	Wetland could make a better contribution to the site and the ecology		Saf
	There is no outlet for the water from the site			Pro div
				Wa
				A le
	The trees are River Red Gums and are prone to limb drop	Increased safety risk due to species		
Maintenance	There is no irrigation system	Causes increased maintenance hours to address issues	Develop a Tree Management Masterplan	
	There are spaces next to the wetland which won't establish lawn and are hard to maintain	Erosion issues and aesthetically unappealing	Design and construct an irrigation system	
	The undulating landform is highly valued but is a difficult environment to provide All Abilities Access	Large and obtrusive infrastructure solutions will not be accepted by the community or Council	Utilise these spaces to improve the wetland health	
	There are no paths to the centre of the site and pedestrians utilise steep grades which pose safety risks	Limits the use of the reserve, even as passive open space		De of a
A 00000	There is limited lighting for pedestrians	Night access is limited and this can impact on safety	Improve access without large and obtrusive infrastructure	De
Access	Replica railway is a trip hazard			Pro
	There is an existing pedestrian / cycle network on top of the levee and on the old upper bank, however there are limited reasons to stop at the Aquatic Reserve			Hu
	Existing swale crossings are narrow and the grades around them are steep	These are limiting site access		Rel
The	It is considered to block views to the river	Protects from flood	Undertake a Levee Study to determine the future of the levee	Det low
Levee	There is a trip hazard on top of the levee	Safety risk	Regrade the top of levee and install a new path to limit risks to the public	
	The number of events per year and type of events is dropping			
Events	Available services and infrastructure is limiting the events	Councils feels they do not have a venue that can be charged a hire fee due to site conditions	Invest in infrastructure to support events	Ins
	The location of existing underground services is unknown	Services are getting damaged	Develop a calendar of events	Pro
	The Riverboats Music Festival requires significant increase in maintenance before and after the event			Est fitt
Un -				Inc
programmed space	This site is generally a flexible un-programmed space with some picnic facilities and nearby BBQs			Un dor
•	There is no playground for any age group	Limits site use by a range of age groups		De
				Exp Wo
Tourism	The Visitor Information Centre is likely to not be housed at this location and to dramatically change form			'Ge
	The Replica Railway is not able to run currently			The

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etailed recommendation

, drainage system and treatment targets
rculation pump to provide continuous flow and a stormwater harge
se existing weir levels
existing pipes are to be cleaned of any sediment
ety batters with dense planting around the wetland
vide pools and instream meanders in the existing swales with a erse range of indigenous plants
er from the existing water right used to top up water
gal point of discharge for the site is to be established
ign, document and construct grassed ramps to provide two points ccess to the base of the site
ign and construct low level site lighting
vide paved crossings between the lines at key points.
o of facilities including a toilet, drinking fountain and hike parking
· · · · · · · · · · · · · · · · · · ·
uild swale crossings and relocate to limit grading problems
ailed investigation will be needed to determine whether removal / ering of the levee will actually open viewlines to the river
all additional town water taps and three phase electricity points.
vide an 'As Built' Services Plan to all event managers
ablish marquee points to cater for different sized marquees and ng for temporary lighting
ude a sewer discharge at the proposed toilets
programmed open space is highly valued and should remain as the ninate space type
elop a play space concept
lore the opportunities to develop a contemporary interactive trail of llithica history and culture
otourism' applied to support an integrated response
Replica Railway could benefit from a business plan

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Short Term Recommendations

The following table outlines the short term recommendations:

	Bisiness Blair	NIA SIL SIL SIL SIL	Comminities	Constillat	RUITE SUI SUI	Cijonal 13) Cevelopine	Design Do	Doc.	HIR CHIAL	AS DIL SURVEY	AR AN ANT	väintenau sset rest	ACE PTOST	1911
	Recommendation	L	Plann	ing		Desig	gn and	d docu	iment	ation	Co	nstru	ction a	nd
	Levee removal study													
		\vdash										sub	total	
	Levee top reshaping	\vdash		_										
	Site design and documentation	\vdash		_										
	Grassed Ramps	\vdash		_										
	Wetland modifications	\vdash		_										
	Swale Bridges reconstruction	\vdash												
	Irrigation	\vdash												
В	Tree Management Masterplan Actions	\vdash												
ter	Railway line pedestrian access	\vdash		_										
ort	Post and Bollard fencing	┝──┢		_										
Shc	Toilet and facilities hub with sewerage													
• • •	discharge for events	├─── ┣		_										
	Two x town water taps	┟───╊												
	I wo x three phase electricity points	┟───╊												
	Marquee Anchor Points	├───╊												
	Frinting comises plan	┟───╊				$\left \right $								
	Existing services plan Bollard lighting to grassed ramps	┼──┢												
	Bonaru ngnung to grasseu ramps													

Why this order of priority?

The Levee study is a high priority because a change to the levee will have significant implications for the management and use of this site. The levee is the difference between this site remaining 'dry' during a 10% flood event and returning to part of the flood zone. If the levee is removed all recommendations will need to consider and respond to the flood potential. To limit unnecessary spending the levee study should be undertaken first. This will limit the impact of a large infrastructural change to the site and it's facilities.

The short term staging of recommendations is based on the need to address pressures on maintenance and public safety issues first. The wetland is an example of both a maintenance issue and a public safety risk which has made it a high priority.

The facilities supporting events have been included because they will also help with maintenance and will protect the new infrastructure. For example: currently during an event "bump in and out" it is common for a service to be punctured by a star picket or tent peg. The event infrastructure suggested eliminates many of the current situations star pickets and tent pegs will be needed and reduce the risk of damage to new investment.

While further staging could be done, detailed consideration of the cost implicatons and likely disruption of multiple projects would be required. For example the landform works in the wetland will require the same machinery as the grassed ramps. Not only will there be additional cost, but the site recovery afterwards will be affected and therefore Council Works Team resources.

Support Eve

Address public safety issues



Access and connectivity

The site is contained within the old upper bank of the Murray River and a levee (protecting the site from the 10% flood from the Murray River). This landform has created a natural amphitheatre within the river environment and it is unique to the Murray region. The site is undulating and the only formal access is on the levee and the old upper bank.

The levee

The levee was constructed in the 1970's to protect this site from flood. During the course of this project a proposal to remove the levee grew in momentum. The levee is a core feature of the current site and its removal would create a dramatically different set of site conditions, constraints and opportunities. Some members of the community have suggested that the levee should be removed or lowered to provide a visual connection to the Murray Rives. This was not included in the original brief for this project however, the issues have been considered and the adjacent table summarises the preliminary findings of the impact of altering the levee:



Impact of altering the levee Positives Options Existing levee with The site is protected from the 10% flood. This has allowed for minor sculpting to the the grass to be established and maintained. There is also a h top as recommended level of reassurance for event managers that the site will be in this report The levee creates a natural amphitheatre atmosphere which attracts event hire of the site The levee creates a space which is unique to the entire Murr **River Experience** Levee top shared path provides a level path with great views into the tree tops and down into both the river and the site. This path provides a dry connection during flood times. Complete removal of Open to the river providing views through existing establish the levee River Red Gum forest from the existing upper bank/ the Vis Information Centre Removal of sections Partial river views through existing established River Red G of the levee forest Areas of a natural amphitheatre atmosphere which attracts event hire of the site Reduce the Partial river views through existing established River Red G levee height by forest approximately half Smaller amphitheatre which may still provide a site asset Discharge of flood water will require a pump

Existing conditions Section B - The bridge to the wetland

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	No river views which are seen as Echuca's most significant
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	negotiate the upper bank batter.
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	No amphitheatre to support events
	Lack of flood protection will impact significantly on the
	maintenance requirements, may impact on tree health and the
	ability to hire the site for events
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•••••	
	No levee top path experience. Realignment will need to
	negotiate the upper bank batter.
	Lack of flood protection will impact significantly on the
	maintenance requirements, may impact on tree health and the
	ability to hire the site for events
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	Reduced protection from flood may impact significantly on
	the maintenance requirements and ability to hire the site for
	events.
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	no rever top path experience. Realignment will need to
	negotiate the upper balls batter.
	No levee top path experience. Realignment will need to

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The levee continued

Our current findings suggest that the levee makes a significant positive impact on the Aquatic Reserve site and the greater Echuca region by ensuring it can be maintained and can provide flood protection that allows large events to be held here. We estimate that approximately 170 trees may require removal if the entire levee is decommissioned. The study of the levee was a minor part of this project and further investigation is warranted.

Recommendation: thoroughly investigate the levee removal including:

- A Visual Assessment Study to establish the quality of the view to the river eg. How much of the wharf can be seen and where from? Can the riverboats be seen and where from?
- A site analysis to compare the current conditions and the opportunities with the hypothetical levee removal. The focus area of this analysis will need to stretch from the Moama Bridge to the Wharf.
- Flood modelling to the satisfaction of the authorities to identify the flood implications of removing the levee both on this site and within the catchment.
- A business case to outline what contribution the views will provide to Echuca for visitors and locals alike. It should also assess the economic impact on Aquatic Reserve and the Echuca Moama region by not being able to provide large events with the security of flood protection.
- While this is not a Ports of the Murray project, the principles set out should guide elements which impact on tourism. The proposal should undergo Authenticity Testing and be reviewed against the Prioritisation Key Criteria.
- A consultation program to ensure the findings of the study are supported by the community. All findings will need to be transparent and evidence based.
- A Masterplan from the Moama Bridge to the Wharf is required.

At this stage, this project assumes the retention of the levee. The levee top path, however, has areas where the slope to either side presents a safety risk.

Recommendation: Regrade the top of levee and install a new path to limit this risk.

Access to the viewing platform and the base of the site

The viewing platform is at the lowest area of the site and is a key destination. The facility is used as the stage during Carols by Candlelight and during the Riverboats Music Festival. To access this area the public walk down slopes ranging from 1:7 (main access during Riverboats Music Festival) to 1:15 (near the back of library). While there is no formal path, these grades are difficult to undertake and significant assistance is required for wheelchairs and walking frames. Improved access will support local and visitor use of the site. In line with the Guiding Principles, formalised infrastructure such as stairs paved paths and ramps with handrails are not acceptable.

Recommendation: design, document and construct grassed ramps to provide two points of access to the base of the site. These ramps should be no steeper that 1:22 and should provide a meandering journey that limits the impact on the existing trees. The exact location of the ramps is subject to detailed design. The location of the start of one ramp will need to align with the proposed box office site. This will need to be discussed with the Riverboats Music Festival Manager as preliminary investigations suggest a minor relocation of the box office would be required. Please note however, that the box office would be still within the key view lines on Heygrath Street.





Existing condition photo - taken at the Riverboats Music Festival 2015





Legend

Water improvements

Proposed circulation pump to ensure water circulation and improve water quality Proposed improved water flow in wetland

Existing connecting pipes to be cleaned to ensure water flow Existing weirs to be modified to ensure water flow and provide additional hydraulic head within sediment pond Area to be utilised for water

aeration Proposed riparian planting to swale and safety batter to improve safety by limiting direct access water by children and provide improved habitat for wild life

10% flood level

Note Holistic overall Stormwater Management Plan required.

> Scale: Not To Scale Date : 20.07.2015

Liesl Malan





Existing

Catchment storm water from Echuca streets is currently entering the wetland system via pipes from the corner of Heygrath St and the Cobb Hwy

Storm event water flows are diverted via a pipe to the Murray River

Please refer to Wetland Site Analysis for detailed analysis of wetland issues.



Stage 1

To address issues raised in the site analysis;

Water drawn via the water right from the Murray River will be required. (Location TBD)

By introducing a pump and improving infrastructure (eg weirs and pipes) water will continuously flow through the wetland / swale system

A system to discharge water to the Murray is required (location TBD)

Planted safety batters will improve aesthetics, habitat value and safety for park users.

Habitat

Quality

Safety



With the introduction of a pump there are new opportunities to consider;





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Retardation

Interaction

Social



Stage 2

Cleaned water from the wetland pumped to a splash deck, then cleaned again to remove litter and sediment prior to discharge into the river





Water Quality

The wetland has regular blooms of blue green algae. The ongoing blooms impact on maintenance resources, as the Works Team repeatedly address the smelly and unattractive, health risk. Heil Engineering Consultants have undertaken a study of the wetland to determine why there are ongoing blooms and how to improve the wetland function. The key findings are:

- The site is a key storm water retention and treatment feature and services 21 Ha of Industrial and Residential Land.
- A Strategy prepared in 2005 was implemented however, system deficiencies remain.
- Stormwater retardation is uncontrolled as there is no formal discharge point.
- Flood waters are back flowing into the site via the drainage system flooding the site.
- The storm water treatment system is not functioning as intended.
- There is no water body circulation, resulting in poor water quality.
- Water edge has the potential to be unsafe

These findings, at this stage, are conceptual only and will require further development including functional layout design MUSIC modelling and integration with flood modelling.

Recommendation: Undertake a review of the existing drainage system and then prepare a Storm Water Management Plan for the site to consider the following:

- Catchment analysis including a hydrologic assessment to investigate the sites role as a retention basin and the effect that this may have on maintaining reliable access to this site for planned events.
- Consider the EAR's ongoing role as a stormwater retention basin in conjunction anticipated ongoing use of the site.
- Investigate the internal and external drainage system and determine performance targets.
- A circulation pump to provide continuous flow through the wetland and provide a means of discharging stormwater from the site.
- Raise existing weir levels to generate fl ow through the treatment system
- The existing pipes are to be cleaned to remove any sediment
- Safety batters are established and densely planted around the wetland water body
- Water from the existing water right is utilised to top up water body where and when required.
- A legal point of discharge for the site is to be established through liaison with the receiving authority
- Improve the aeration of the water by reshaping the swales to provide pools and instream meanders as well as developing an aeration area near the VIC

Ecological habitat values in the wetland

The water's edge is currently accessible to the public without any barriers. This risk is limiting both general use and the type of events which can be held on the site. Planted safety batters are an industry standard - details can be found in Melbourne Water's "Design, Construction and Establishment of Constructed Wetlands: Design Manual" (at the time of this report this document was in final draft form, expected to adopted in the next 6 months.)

Recommendation: Install planted safety batters to address safety risks. Council could consider temporary fencing to limit risk in the interim.

The Site Analysis process revealed that a diverse range of threatened fauna sightings have been made in this area. The existing wetland body provides limited habitat at this stage, but has the potential to be significantly improved with increased diversity of environments and plant species.

Recommendation: Provide pools and instream meanders in the existing swales and ensure a diverse range of indigenous riverine plants are planted and maintained.

Access to deel water is a safety ris Algae bloom 🎌 •











Access over one of the swale crossings

One of existing swales has three low boardwalk crossings. To address the current drop into the deep water below there are hand rails which create a strong enclosed feeling. The crossings are too narrow to pass a pram. The recommended reshaping of the swales means that the location of the crossing can take advantage of shallow areas where handrails are not required. Note kick boards will still be required to limit wheelchairs and prams accidents. In addition the slight reshaping around the crossings will improve the access to the crossings.

The middle crossing is a safety risk due to the steep localised grades around it. This risk is increased during the Riverboats Music Festival when the bar area is adjacent and the site is crowded. Please note this crossing is highly valued during the Festival for the access it provides to the central stage area.

Recommendation: Rebuild swale crossings. The new design should address adjacent grades, provide good views and be of a generous width.



Existing crossing - typical width



Existing crossing Steep gradient at middle crossing

Recommendation: Address the middle crossing as a priority to limit the risk to the public. An interim solution such as relocation could be considered to provide a timely response to this issue before the next Riverboats Festival Event. Decommissioning the crossing without replacing is not recommended.





Precedent image - Victoria Park

Simplify the maintenance requirements

The Aquatic Reserve site currently requires high man hours to combat the many site issues, with low levels of infrastructural support to deliver a high standard of manicured landscape. Continuing to provide the high quality space is important to the general everyday use of the site, to the running of events and the ability to attract more tourism opportunities to this space. In general all proposals in this project, and in future proposals, will need to consider their impact on the available maintenance resources and budget.

Irrigation

The number one time-hungry element to the site is the lawn. The lawn area is also the site's biggest asset as surrounding areas are subject to flood inundation and establishment of grass has not been as successful. To achieve the green picnic lawn and keep the dust to a minimum, the Works Team is currently pumping water out of the wetland and hand watering the site with hoses. This lawn is key in providing an event space. A pump is installed next to the viewing platform, however no irrigation system currently exists.

Recommendation: Design and construct an irrigation system to reduce the ongoing maintenance hours. The irrigation system should provide the same or better irrigation to the grass areas. It should be developed in close consultation with the Council Works Team and in particular Graham Kissell who has an excellent understanding of this site's needs and constraints. The irrigation design will need to carefully consider the existing tree roots to minimise damage during installation. The extent of irrigated lawn may need to be reduced.

Note an 'As Built' Irrigation System Plan will need to be included on an Existing Services Plan to ensure this asset is protected during events (marquee set up etc).

Existing Trees

Several reports have been commissioned to assess the health of the trees and provide advice on risk management. The sizable River Red Gums are well loved by the community and provide the setting for the site. The trees provide:

- A strong connection to the riverine environment
- Excellent summer shade
- A habitat for wildlife

The trees are all roughly the same age and are located in 'random locations' on the site. It has been speculated that they have grown from seed during flood inundation. Management of the trees has been reactive to issues and relies heavily on pruning and tree removal. Due to their height a tower is required to prune them. At this stage, no overall Tree Management Masterplan exists for the site.

A Tree Management Masterplan would provide the direction to move from the current reactive program to a long term strategic plan with recurrent funding in the works budget.

Recommendation: Develop a Tree Management Masterplan. The Masterplan should view the trees both as individual trees with specific issues and also take a holistic view of their contribution and impact on this site and to the greater environment. It will need to consider them during general use as well as during weddings and events. The Masterplan should include a tree audit and a register of all trees. It should map and document issues and requirements of each tree to manage the tree population. Ensure available resources and budgets are a key consideration. The Masterplan recommendations will need to take a balanced approach to existing / proposed uses and tree management. Refer to the diagram for preliminary actions identified by arborist Ben Kenyon, Director of Homewood Consulting.



Existing site conditions - irrigation hose

Develop a Tree Management Masterplan

• Move from a reactive program to recurrent funding and more long term strategic plan

•Audit and create a register of all trees

• Map and document issues and requirements of each tree to manage the tree population

• Ensure available resources and budgets are a key consideration

•Recommendations to take a balanced approach to existing a proposed uses and tree management

2

location of infrastructure and facilities to limit impact on tree health and risk to public







The Replica Railway Line

On the historic Railway land a replica railway links the Port of Echuca with the Echuca Train Station. Significant investment was made to build this project. Due to changing regulations that control pedestrian access to railways, the train has reportedly only run once. The infrastructure is beginning to age and is affected by disuse, with some warping and distortion of the rails.

The disused railway line itself, presents a trip hazard down the length of the Aquatic Reserve site which is difficult to address. The project team has been instructed to retain the facility. Methods to address the trip hazard have been discussed including: burying and grassing over the top and paving similar to a mall. These suggestions will impact on the usability of the train line. It is not the intention for outcomes of this project to limit its future.

Recommendation: In the short term, install paved crossings between the lines at key points. In the long term, the Replica Railway Line requires a business plan and purpose to be developed. Outcomes of the long term plan should consider safe access for the length of the Aquatic Reserve site.



Existing conditions - replica railway



Precedent images - Bourke Street Mall and other paving between rail line examples - All images from the web



Fencing

The existing fencing is of a mixed style and many areas are approaching the end of their useful life span. The fence on top of the levee is used to support the site fencing for the Riverboats Music Festival.

Recommendation: Install a new fence as required. Consider a design which supports event requirements and reflects the modern palette being used in the street and park furniture of Echuca. Fencing should ensure restricted car access but should be limited to only where it is strictly necessary.



Events

Many events are held on this site including Riverboats Music Festival, Carols by Candlelight, weddings, funerals and christenings. There has been a drop in the events that can be held on this site due to dust, access to the water's edge, access down steep slopes, lack of toilets, limited services and risk issues. Due to the current site issues, there is no charge to use Aquatic Reserve for events, even for large events like Riverboats Music Festival. To understand the site elements which make the running of events difficult the project team attended the 2015 Riverboats Music Festival and met with the Executive Producer, David Fraser. The large complex multiday event revealed issues which were relevant for smaller events such as weddings. The Project Reference Group directed that the site needs to be attractive as both a passive recreation space and as an event space.

The Riverboats Music Festival is considered a good model for future events. While David Fraser noted that they aim to be low impact, a multiday event still has a large impact on the park. Significant site clean up is undertaken by the Festival Staff and further maintenance and repairs are undertaken by the Council free of charge.

Recommendation: Invest in facilities which support events and reduce the running costs for event managers. This model intends to create a venue that can be charged for, have service limits set and create a calendar of events to promote local and visitor use of the site.



Passive Open

Liesl Malan Landscape Architects in collaboration with Heil Engineering Consultants

Toilets

There are some older toilets located in the VIC building however they are outside of the event area. Large events bring in port-a-loos or semi trailer toilet trucks. During multiday events there is no access to pump out sewerage. A larger vehicle is therefore required and there are additional costs associated with this.

Recommendation: Install a toilet adjacent to the event area. A permanent toilet below the 10% flood level is not appropriate, however a toilet above the flood level could be achieved near the back of the library. This facility could be used to support small events such as weddings. On the plan it has been positioned to meet up with a grassed access ramp to provide All Abilities Access from the event space to the toilet. To support larger events a discharge point for the sewerage from toilet trucks could be included and the toilet trucks located to provide night time servicing. In addition to supporting organised events, a public toilet in this area would meet the needs of the bike path users. It is further recommended that a drinking fountain and bike parking be included to potentially extend the length of stay by the general public at the Aquatic Reserve.

Services

Large events with food vans currently, are unable to get enough power from the existing site power. Diesel generators are used to power these vans and the cost impacts on the event profits. In addition to the power issue, there is limited town water tapping points. Catering staff carry water to the vans for food preparation and cleaning.

Recommendation: Install additional town water taps and three phase electricity points. Review of the size of the existing diameter of the water connection is required to ensure it meets the needs of a large event.

It is common for the unknown location of services to cause accidental damage to services such as water pipes. **Recommendation:**

- Provide a plan locating all services (water, irrigation, power and drainage) for all events. This will also place the responsibility to ensure the services are not damaged on any event manager.
- To further limit these issues marguee points should be established to cater for different sized marguees.
- Provide fittings for the temporary paper ball lights such as a removable bollard fitting

Lighting

There is currently limited lighting to the Reserve. Concern over public safety as people leave events in the dark has prompted the need for low level lighting to the grassed ramps.

Recommendation: Design and construct low level site lighting. The lighting should light the ground plane and there should be limited light pollution to the trees and other habitat areas. Consider the use of a bollard light and ensure the materials are unobtrusive in the natural setting.

Please also see

- Access down steep slopes is covered in the 'Access' section of this report
- Access to the water edge is covered under 'Water Quality' in this report
- Dust and the maintenance costs are covered in 'Simplify the maintenance requirements' section of this report
- Risk issues are covered in the 'Existing Tree' section of this report

Toilets at the Riverboats Music Festival

















ground plane



Proposed low level lighting on grassed access ramp



Medium Term Recommendations The following table outlines the medium term recommendations:



Why this order of priority?

The short term works focus on improving fundamental issues with maintenance, access and public safety. Once this has been achieved there are opportunities to increase the reasons for visiting the Echuca Aquatic Reserve. In the medium term this report identifies and recommends opportunities to increase play for all ages and integrate the site collaboratively with the adjacent tourism areas.

To preserve the un-programmed open space, the medium term recommendations are proposed on the edges of the site, reserving the centre for public open space. These recommendations will balance the needs of events around the edges of the site and provide passive recreation at the core of the site.





Live and Play

The needs of both visitors and local community members overlap on the Aquatic Reserve site. It is important that the site continues to caters for both locals and visitors in a balanced manner.

Forecourt to the Council / Courthouse on the reserve side While the Council and Court House buildings currently have significant frontage on to the Reserve, little has been done on the outside of the building to promote this frontage and improve the connections. The space is under utilised and feels exposed in contrast to the established trees in the Aquatic Reserve. This area has the potential to provide facilities to both users of the path and occupants of the buildings.

Recommendation: Develop a landscape plan for the forecourt area to provide a "frontage" to the river and Aquatic Reserve site. This should include new tree planting to provide shade from the north to building. The existing windows take in a view of Aquatic Reserve and should be a key design consideration. The new facilities should provide for quiet outdoor activities. It will be a valuable outdoor space for lunches, reading and support a healthy lifestyle for workers within the office building.



Existing conditions Council / court house interface



Existing conditions section





University of Adelaide

All images from www.tcl.net.au



University of Adelaide



Mobara Park



University of Adelaide

Arizona State Polytechnic University Image care of Christine Ten Eyck

Proposed Forecourt section





Aboriginal history, culture and input

Echuca is part of the Yorta Vorta Nation and the local community are known as the Wollithica people. Wollithica means "water-meeting". During the early stages of this project we meet with a representative, Ray Ahmat, from the Yorta Yorta Nation Aboriginal Corporation (YYNAC). Ray provided a general cultural background to the site however he noted it was not his country and therefore could not provide a specific insight into the history of the Aquatic Reserve site. Rick Ronnan of the Wollithica people was contacted and he provided the following history of the site:

Before there was a levee this site was part of a swampland. Rick played on this site as a child while his mother was cleaning a house opposite owned by a dentist. He had a raft which he used to move through the swamp. The original owners of the American Hotel noted that the land where the library and Council buildings area was used for corroborees and was a meeting place for the area.

Rick's Elders lived on the Aquatic Reserve site when Echuca's economy was based on rice, rail and ball bearings. He noted that many middens were lost already due to cattle being kept on them. The shell grit stopped cattle from slipping so middens were sought after locations for cattle pens. As the economy turned to tourism, the police were sent to move the Wollithica people from this area. To move them on the police burnt their huts.

Opportunities to showcase the Wollithica Culture and History

A key outcome of the stakeholder consultation was support for including an Indigenous 'theme' to this site. Rick Ronnan has suggested a trail to exhibit the culture and history of the Wollithica. He has suggested starting the trail at the bridge and following the levee to the library. The following is a summary of his suggestions:

On the riverside of the levee he has suggested a mock camp with clay oven and fibreglass replicas of artefacts. This area would need to be able to be secured at night. The screens he has drawn are to create this fence. He has suggested laser cut steel to incorporate graphics. There are no scar trees on this site however, he has drawn one to be relocated when they are threatened by development. Rick notes the scar trees are already dead, making relocation easier. He has suggested a formalised amphitheatre with a space for shows and dances. We discussed that there are young people who dance and could be involved. While the content of the drawing sent only covers traditional life, Rick has noted that there are issues which are the truth and would need to be covered, including the history of displacement and institutionalised fringe dwelling.

Judy Atkinson was also contacted in the course of this project. She and Clive Atkinson have been key designers in the development of Dreamtime Gardens in Echuca and Ballarat. They have developed a concept for an Indigenous Garden in 2008 for the area near the Shire of Campaspe Council offices.

The trail concept and possible Indigenous Gardens have the potential to provide a new and unique experience which could attract locals and visitors alike. This is a largely untold story in rural and regional Victoria, it warrants further exploration and development.

Recommendation: Explore the opportunities to develop a contemporary interactive trail which provides a dynamic visitor experience. The concept development will need to connect to the site context and the existing tourism support system. We note that this project requires strong input and direction from the local Aboriginal Community. The content of the trail will have some confronting themes, it will cover 'sorry business' and need to confront difficult issues. It has also been noted that there are some divisions within the Wollithica people. For these reasons we recommend that mediation be included as part of the development of the trail to ensure that the outcomes are owned by the entire Wollithica community and the issues are respectfully covered.









Ballarat Cemetery Dreamtime Garden Image from The Courier March 6 2013





Indigenous dancers in Echuca image from www.visitvictoria,com



Childs Play

There is the opportunity to develop a "river experience" accessible for children as an iconic play attraction in the region. A public splash park model has been discussed. The Bright Splash Park has been used as a precedent, however the form and execution should reflect the River Red Gum environment and provide a nature based play opportunity with a water component.

Themes to explore

There are opportunities to celebrate the unique environment of the Murray River and showcase the native fauna and flora. The form of the equipment should reflect the natural qualities of the rivers and creeks in the region. This area has a rich Yorta Yorta Nation history and more specifically of the Wollithica People. Water is central to traditional life and there is an opportunity to showcase the river based culture. To illustrate this we have included the work of a local Yorta Yorta Nation artist, Dixon Patten (Junior). Any graphic representations of local culture should be developed collaboratively with the local community with the involvement of a Yorta Yorta artist.

The Royal Life Saving National Drowning Report for 2014 shows that 39% of all drowning deaths occur in Inland Waterway locations. This is the highest percentage of all drowning deaths. River swimming requires knowledge and experience. A playspace with water elements provides the opportunity to educate children about safe inland swimming.

Site based design issues

The location makes use of the views to the river and passing river boats, it is visible from the pedestrian bridge above and makes use of the levee. The retention of the levee landform in this area will provide interest and diversity of experience. This area is above the 10% flood line could be used for the location of infrastructure such as 'water toys'.

Water source

The interface with the Murray River is a key consideration. There is an opportunity to investigate the developing technology of natural systems to clean water without the use of a plant room or chlorine. The playspace provides an opportunity to utilise water from the wetland via a pump for the water play element(s). Any water from the water play element would be filtered to remove litter and contaminants prior to re-entering the river system.

Recommendation: develop a play space concept with water elements.





mages sourced from the web and photos of the Ian Potter Foundation Children's Garden Echuca Aquatic Reserve - Infrastructure & Service Plan

Lake convertee to functioning Diagram of potential water movement for wetland and playspace



Dixon Patten (Junior)

Water play element to be integrated with the landform

below 10% flood level Water returned to Murray River

High cost infrastructure above

the 10% flood level

iesl Malan Landscape Architects in collaboration with Heil Engineering Consultants

Natural play elements

via natural filtration system



Long Term Opportunities

The following table outlines the long term opportunities:

	Business Listel Asses	An and rent	Conni, Conni, Sile Anal, Sile Anal,	munity Canal reh	Constillat	Rithe Still	itional la, excloping	Design D ant les	Doc. exclopin	HIPPETICAL SETT	AS BILL CONSTRUCT	AAC AC ACCOUNT	viintenat. sset real	rce Pros	1011
	Recommendation		Р	lannir	ng		Desi	gn and	d docu	imenta	ation	Co	nstru	ction a	ind
<u>⊃</u> 00′	The VIC building														
Lon tern	Railway line														



Further opportunities identified

Tourism

In 1997 the Shire was appointed as Committee of Management for this site. At this stage the Aquatic Reserve site was noted as an area to promote tourism.

Echuca has an economy strongly based on tourism. The Murray River and the largest fleet of functioning riverboats are seen as the jewel in Echuca's crown. The Ports of the Murray River Implementation Strategy October 2013 (PMRIS) put forward a vision for the entire Murray River based on contemporary idea of 'Geotourism'.

"Geotourism is defined as tourism that sustains or enhances the geographical character of a place—its environment, culture, aesthetics, heritage, and the well-being of its residents." One of the aims of the PMRIS is "to create an outstanding Murray River visitor experience inspired by diverse and unique narratives that are embedded within each of the ports." It is a collaborative strategy which aims to elevate the Murray River in the Australian psyche. The adjacent Port of Echuca development was part of implementation of PMRIS.

While the PMRIS represents a series of key projects at a regional scale, the strategy puts forward important principles which should influence any project with a tourism element on the Murray River. These include:

- Authenticity requires projects to be individual, unique and imbued with a sense of place with a specific connection to the people and culture of that location.
- Collaboration requires the project to take account of other initiatives along the Murray River and ensure that they have a point of difference.

Opportunity: These principles were developed with a regional approach in mind, but the thinking should be applied to the Aquatic Reserve as a tourism site within Echuca.

The Visitor Information Centre (The VIC)

The VIC and Carpark areas are currently part of a separate project to update them in the short term. It has been noted that it is not likely to be the long term site for the VIC and that the form and services are likely to change dramatically with increased digital expectations of visitors.

The VIC building includes the heritage listed Pump House. The Pump House has a valuable story to tell in the history of the development of Echuca. This story is not currently easy to read on the site. There is also an opportunity to further integrate the Aquatic Reserve site with the Pump House and the VIC. See the appendix for further information.

How is this different, and how does

Integration of the Aquatic Reserve site

What are the new opportunities

How can this building enrich

Echuca for locals and visitors? How can this building preserve

and reveal the history of the Pump

it collaborate, with the Discovery

that could happen here?

House and Echuca?

Centre?

and existing buildings





Visitor Information Centre and historic Pump House - preliminary analysis



Conclusion

The recommendations in this report can be measured against the strategies from the Campaspe Open Space Strategy

Developing Effective Policy and Planning Mechanisms

Develop an internal Open Space Planning Mechanism

The Project Reference Group consisted of officers from a broad range of areas of SoC. In a round table discussion Council officers developed a broad and diverse understanding of the site and the guiding principles. The outcomes of the Project Reference Group meeting set the course for the proposals which were presented to at the Stakeholder Group Presentation. These mechanism have ensured an integrated response and allowed the project to work across disciplines, integrate a whole of Council approach and provide for community input.

Improving the Quality of and Access to Open Space

Equitable access

Equitable access into the Aquatic Reserve was a core issue. The guiding principle "ensure infrastructure is unobtrusive" ruled out traditional proposals such as stairs and access ramps, however Access for All Abilities has been provided via grassed ramps.

Supporting walking and cycling in open space

A significant walking/cycle route exists on the site already. This project proposes increasing support through proposed infrastructure including drinking water fountain, bike parking and toilets.

Developing a Sustainable Open Space System

Economically Sustainable Open Space

The Aquatic Reserve is estimated to currently require \$30,700 in net running costs annually and require high man hours that could be spent on other reserves. Conversely, the site via the Riverboats Music Festival alone, is estimated by SoC Officers to have contributed \$1.6 million in 2015 to the Echuca Moama Region. The proposed works require a modest investment in infrastructure to reduce the maintenance costs. In return, they provide an opportunity to increase the economic contribution the site has to the entire region by supporting more events.

Investment in the setting, spaces and infrastructure of the Aquatic Reserve is expected to provide support for the ongoing hosting of existing events. It will also provide the basis for the growth of new events, adding to the overall economy of the region.

Environmentally Sustainable Open Space

The existing lake and swales were designed as a wetland in 2005 by Parsons Brinkerhoff, however the infrastructure is not operating as designed and the lake has been plagued by blue green algae blooms. The wetland is listed as a retardation facility, however it does not meet the requirements of a wetland as it has no outlet.

To improve the wetland function and maintenance requirements simple interventions have been proposed which would provide significant environmental and habitat improvements.

Promoting Open Space System and Activity Within Open Space Improved social connection through creating meeting spaces Many of the proposals in the project aim to improve the opportunity for social connection, furthermore, the proposed forecourt to the Council / Court House buildings is designed specifically to create a potential meeting place.

Improved economic outcomes through creating spaces for outdoor activities and events.

The proposed works have been designed to support and promote events of all sizes on the reserve including: wedding and funeral ceremonies, wedding receptions, ticketed event days (commercial and community), community events, car event days, exclusive car event days. Currently, Council does not apply any hire fees for the use of the Aquatic Reserve, as part of this project, tables exploring the relationship between maintenance costs, hire costs and service limits to estimate a potential net cost of the reserve, have been developed by SoC officer Brendan Gosstray.

Protection of natural environment

Protecting, supporting and enhancing the natural environment are key outcomes of the proposals. The following are some key examples:

- A core concept to the proposed wetland improvements is diversity of habitat achieved through the new swale form. The instream meanders and pools and riffles seek to provide not only improved water quality outcomes, but also increased diversity of plants and environments to attract a greater variety of animals to the site.
- The proposed Tree Management Masterplan seeks to manage the associated risks of River Red Gums, it also aims to protect the trees and provide for their ongoing presence through a succession planting program.
- Lighting recommendations have been tailored to consider methods of limiting light pollution and the potential impact on wildlife.

Appendix



Echuca Aquatic Reserve Client: Shire of Campaspe Project Number: 1484

Landscape Architecture: Liesl Malan Landscape Architects PO Box 78 Harcourt Victoria 3453

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Preliminary 'ball park' costings Engineering: HEIL ENGINEERING CONSULTANTS PO Box 2068 Swan Hill Victoria 3585

No	ITEM	UNIT	QTY
0.00	Pre works stage		
0.01	Levee removal study	1 x Item	\$40,000.00
1.00	Stage 1 - short term - Wetland	total	\$323,647.50
1.01	Site design development and documentation, (refer report). Quantity is based on total development cost for this stage.	10%	\$29,422.50
1.02	Review and prepare a Storm Water Management Plan	1 x Item	\$7,500.00
1.03	Provide outlet to Murray River	1 x Item	\$15,000.00
1.04	Provide pump to circulate wetland	1 x Item	\$40,000.00
1.05	Control Structures	1 x Item	\$15,000.00
1.06	Adjust weir heights	1 x Item	\$10,000.00
1.07	Clean out existing pipe infrastructure	1 x Item	\$3,000.00
1.08	Earthworks to create planted safety batters (approx 540 lm @ 5m wide @ 0.5m deep avg.)	1 x Item	\$10,125.00
1.09	Planting to safety batters including soil preparation and additives (approx 540 lm @ 5m wide= 2700 with planting density of 6 x plants per 1m2 = 16,200 plants)	1 x Item	\$13,500.00
1.10	Desilt & reshape the existing waterbody and wetland swales to form pools and instream meander system	1 x Item	\$117,600.00
1.11	Final grading and rock to adjust base of wetland swale to form pools and in stream meander	1 x Item	\$20,000.00
1.12	Planting of wetland swale to form pools and in stream meander including soil preparation and additives (assumes 275 lm x 4m = 1100m2 with planting density of 6 x plants per m2 = 8250)	1 x Item	\$27,500.00
1.13	Provision for further aeration utilising batter near VIC and wetland pump as required by detailed design development findings. A	1 x Item	\$15,000.00
2 00	Stage 1 - short term - basic		\$545 105 00
2.01	Site design development and documentation, (refer report). Quantity is based on total development cost for this stage.	10%	\$49,555.00
2.01	Import fill and construct grass ramps (each ramp approx 100 lm x 3m wide + batters vary allow 1.5m = 450m3.) Note complex working environment due to existing trees and slope.	1 x Item	\$35,000.00
2.02	Establish grass on ramps to be undertaken by SoC to include top dressing, soil additives and preparation, hydrosprigging or hydroseeding with cardboard mulch (each ramp approx 100 lm x 3m wide + batters vary allow 1.5m = 450m2)	1 x Item	\$9,000.00
2.03	Bollard lighting to ramps including electrical connection (assumes 1 bollard per 4m of grassed ramp = 50 approx)	1 x Item	\$60,000.00
2.04	New bridge crossings x 3	Item	\$30,000.00

	Total (excl. GST)		\$2,312,963.25
6.00	Contingency at 30%	30%	\$533,760.75
	Stage 1 and 2 total (excl. GST)	I	\$1,779,202.50
	Stage 2 Sub -total (excl. GST)		\$615,000.00
5.02	and water element(s)	Item	\$500,000.00
r. 00	report). Quantity is based on total site cost. Children's play space with with nature based play focus		\$50,000.00
5.01	Site design development and documentation, (refer	12%	\$60,000,00
5.00	Stage 2 - Children's play area		\$560.000.00
4.01	Council / Courthouse EAR forecourt including granitic sand, trees, understorey planting, steel edge and seating area	Item	\$50,000.00
4.01	Site design development and documentation, (refer report). Quantity is based on total site cost.	10%	\$5,000.00
4.00	Stage 2 - medium term		\$55.000.00
	Stage 1 Sub -total (excl. GST)	İ	\$1,164,202.50
3.08	Document the location of all services and produce a plan to assist event management and protect asets	Item	\$10,000.00
3.07	Supply and install prefabricated unisex toilet with all abilities access	Item	\$120,000.00
3.06	Supply and install sewer	Item	\$50,000.00
3.05	Supply and install marquee anchor points (final number	Item	\$5,000.00
3.04	Supply and install fittings for temporary lighting (final	Item	\$5,000.00
3.04	(assume 300 Im) High Voltage Substation (if required)	Item	\$30,000.00
3.03	Supply and install 2 x phase 3 electricity connections	Item	\$24,000.00
3.01 3.02	Supply and install 2 x potable water connections Upgrade size of existing water pipe infrastructure	Item Item	\$1,500.00 \$24,000.00
3.01	Site design development and documentation, (refer report).Quantity is based on total development cost for this stage.	10%	\$25,950.00
3.00	Stage 1 - short term support for events		\$295,450.00
2.11	Management Masterplan	1 x Item	TBD
2.10	Irrigation to grassed areas Design and Construct	1 x Item	\$75,000.00
2.09	Post and bollard fence upgrade to entire reserve perimeter (835 lm approx @ \$130 /lm)	1 x Item	\$108,550.00
2.08	lowering levee slightly to provide safety verge. Will require the demolition of existing path and reshape ~ 50k, this will also require the reconstruction of the asphalt path ~ \$100k	1 x Item	\$150,000.00
	Adjustments to Levee top path for safety including; demolition of existing path, earthworks to top of levee, reinstate sealed path in asphalt (approx 210 lm)		
2.07	Supply and install bike hoops x 3	1 x Item	\$3,000.00
2.06	Supply and install drinking fountain with dog bowl, including additional water connection	1 x Item	\$5,000.00
2.05	lm) including crossing to railway line		\$20,000.00



The Project Reference Group Diagram

A Project Reference Group was formed at the inception of this project. A meeting was held with all members to direct the project scope and outcomes. That meeting provided the consultant team with clear direction on key project issues. See diagrams on this page.



Echuca Aquatic Reserve - Infrastructure & Service Plan Liesl Malan Landscape Architects in collaboration with Heil Engineering Consultants

tion Centre nging the will need to use models	·····>	Consider the future of the facilities
people are it causing 1s	····· >	Needs a 100 year plan and design to respond to flood and the needs of river boats
uncil and nitment has ted.	·····>	Retain and consider way to provide safe pedestrian crossing
w hand rails installed	·····>	Retain
pace and is as intended	·····>	Remove
with a large out generally a successful odel	······································	Site should be planned to be the home to events and festivals. Facilities should be improved to limit maintenance, reduce costs
community ebrating life as seasonal ies.	**************************************	and create a space that can be charged for.

30

The corporation is currently developing a Memorandum of Understanding with the Shire of Campaspe.



any matters of significance to the Yorta Yorta peoples



The Yorta Yorta people occupy a unique stretch of forest-wetlands that are located in what is now known as the central Murray - Goulburn region.

Site Analysis - Yorta Yorta Nation History and Issues Information from site meeting with representative and http://www.yynac.com.au



2 YYNAC can provide a site induction prior to works commencing to allow for any artefacts or finds to be recorded and respectfully managed.

Image from

in collaboration with

Liesl Malan Landscape Architects

Heil Engineering Consultants

http://en.wikipedia.org/wiki/Histor y_of_Indigenous_Australians



EVC 56 Floodplain Riparian Woodland Description:

An open eucalypt woodland or open forest to 20 m tall over a medium to tall shrub layer with a ground layer consisting of amphibious and aquatic herbs and sedges. Occurs along the banks and floodplains of the larger meandering rivers and major creeks, often in conjunction with one or more floodplain wetland commu Elevation and rainfall are relatively low and soils are fertile alluviums subject to periodic flooding and inundation.



EVC 132: Plains Grassland

Description: Treeless vegetation dominated by largely grass and herb life forms. Shrubs and trees may be also occasionally present.



EVC 816: Sedgy Riverine Forest Description

Conservation Significance

Very High

High

Scattered Trees Very High High Medium Low

Medium

Low

Riverine Sedgy Forest occurs on the floodplain of major rivers in areas of frequent flooding. The overstorey is a tall forest of River Red Gum to 25 m tall. The groundlayer is dominated by flood-related grass and sedge species. Depending on time of year and flooding level, associated water plants may be present.

Site Analysis – Ecological Vegetation Classes – modelling of 1750's vegetation Data from the Department of Enviro ent, Land, Water and Planning Biodiversity Interactive Map







Site Analysis – Threatened Fauna sightings Data from the Department of Environment, Land, Water and Planning Biodiversity Interactive Map Liesl Malan Landscape Architects in collaboration with Heil Engineering Consultants

Site Analysis – Conservation Significance data Data from the Department of Environment, Land, Water and Planning Biodiversity Interactive Map Liesl Malan Landscape Architects in collaboration with Heil Engineering Consultants



Echuca Aquatic Reserve 1997 Foreshore Reserves Plan - overlay with present

Shire of Campaspe



Echuca Aquatic Reserve Context Shire of Campaspe

Legend
Retail / comemercial
Tourism / visitor retail
Office / commercial
Industrial
Accommodation
Church
Civic building
Residential area
Green space (high level maintenance)
Riparian green space
Beach
Levy bank
Upper river bank (some natural some modifided post white settlement - approximate location only)
Embankment assosiated with Cobb Hwy

N.T.S. Date : 19.03.2015 Liesl Malan



Echuca Aquatic Reserve

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Echuca Aquatic Reserve Context

Shire of Campaspe



N.T.S. Date : 19.03.2015 Liesl Malan





Echuca Aquatic Reserve Site Analysis Plan

Shire of Campaspe

Topography

Flat

1:100 - 1:50 Paved surfaces

1:21 AS path max grade with out hand rail

1:14 AS ramp with hand rail

1:14 and below doesn't meet AS for universal access

1:9 -1:7 AS boat ramp

1:4 Standard maximum mower v grade

Very steep

1 : 1250 at A3 Date : 10.02.2015

Liesl Malan



Echuca Aquatic Reserve Site Analysis Plan

Shire of Campaspe

Tree Management Strategy for Shire of Campaspe Prepared by Homewood Consulting May 2013

-,

Zone 1 - Paths, mown / turf and areas of congregation

Zone 2 - Non-turf areas in high use parks. Some infrastructure but more passive than Zone 1

Zone 3 - Natural or unmanaged landscape setting in high use park

1 : 1250 at A3 Date : 10.02.2015

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Echuca Aquatic Reserve Site Analysis Plan

Shire of Campaspe

Private function legend

Areas recommend for private functions in Tree Management Strategy for Shire of Campaspe Prepared by Homewood Consulting May 2013

> 1 : 1250 at A3 Date : 10.02.2015

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Echuca Aquatic Reserve Riverboats Music Festival - Site Analysis Plan

Shire of Campaspe

Constraint of Site

Access constraint Blocks river view

Strengths of Event

Amphitheatre creates distinct space with its own qualities Protects event site from river flood

Lawn

Levee

Access constraint **Resource hungry**

Appeal and comfort Pride in presentation Lawn is a luxury

Site topography

Limits event numbers Intimate high quality events

Swale

Access constraint Limits event numbers Not functioning as part of wetland

Creates natural pedestrian circulation Contributes to natural setting Could be modified to improve water quality

Safety Risks

Main Access Slope

Top of levy - path drop off

Lake and swale edge

Bridge approaches

Railway line - at Toilets and Entry

Trees - limb drop

Site Analysis - Riverboats Music Festival Risk Analysis





Echuca Aquatic Reserve Site Concept Plan - Stage 1 Shire of Campaspe



Echuca Aquatic Reserve Site Concept Plan - Stage 1 Shire of Campaspe



Echuca Aquatic Reserve Site Concept Plan - Stage 2 Shire of Campaspe



Echuca Aquatic Reserve Heritage Interpretation & Sustainable Building Design Research



Shire of Campaspe