Appendix H

Riverlea, Salt Water Lakes, Phase 3 Report.

RIVERLEA
Salt Water Lakes

Phase 3 Report

December 2022

vision to reality

walker

Table of Contents

1. Executive Summary

1.1. Overview

The original approved Master Plan for the Riverlea project incorporated a 3.5 Ha fresh water lake with a network of linear stormwater channels (*floodways*) across the project site for stormwater management and flood mitigation.

Walker Corporation (*Walker*) now proposes a 40 Ha salt water lake system (*SWL*) to be incorporated into the stormwater management and flood mitigation system, as well as providing significant positive contribution to the amenity of the Riverlea public realm. The SWL will be the centrepiece of Riverlea.

In order to gain approval from State Planning Authority (*PLUS*) and City of Playford (*Council*), a 3 Phase process has been agreed between Walker and Council, which is intended to culminate in securing Council's approval to ultimately own and operate the SWL in perpetuity.

The first two of the approval Phases - the 'endorsement' phases - have been completed, with Council formalizing their 'endorsement' to proceed to Phase 3 of the approval process via a letter to Walker dated 22 August 2022.

Through the 'endorsement' phases, Walker in conjunction with its various Consultants, presented a range of design documents and other research documents which dealt with the engineering aspects, construction methodology, operational and maintenance matters associated with the SWL.

This report constitutes Phase 3 of the process and provides additional information describing the merits of the Riverlea SWL, as well as a structure for the transfer to, and ongoing ownership by Council, including details relating to long term operation and maintenance of the system.

Upon approval of this Phase 3 report, Walker will prepare fully detailed engineering designs and specifications and seek formal engineering approval from Council to commence construction of the SWL.

To meet the current rate of sales and development of the project, the construction of Phase 1 of the SWL is expected to be started in October 2023.

1.2. Analysis of Costs

Walker appointed a team of highly experienced specialist Consultants who were briefed to prepare a summary of the capital costs for the SWL system including the lake bodies, edge treatments and circulation system and undertake a comparative cost analysis and to establish the ongoing operation and maintenance costs of the proposed SWL.

The Consultant Team compared the total annual operation and maintenance costs of the originally approved Riverlea floodways proposal with the current SWL proposal.

The findings of the analysis are summarised in the following sections.

1.3. Capital Expenditure for the SWL Proposal

The total capital cost of the complete SWL system is estimated to be **$36.25M**.

1.4. Total Annual Operation and Maintenance Costs at Full Development

The general operation and maintenance costs for the proposed SWL system incorporates both the lakes and associated channels and parkway links that comprise the stormwater and flood mitigation system.

The combination of water bodies, edge infrastructure and landscaped areas generate a range of operational and maintenance requirements to be considered, including the management of water quality.

The general operating and maintenance costs for the complete SWL system is estimated to be **$3.24M** per annum.

1.5. Annual Operating and Maintenance Costs for SWL Circulation System

Included in the above figures are the annual operation and maintenance costs of the 'circulation system' for the SWL totalling **$472K** per annum. These costs incrementally increase from commissioning of Phase 1 of the SWL through to commissioning of Phase 3 of the SWL.

With the introduction of alternative energy sources for the driving of the circulation system there are opportunities to reduce the operational costs further.

Alternative energy sources have been investigated and solar energy has been identified by both Enerven and Planet Ark as being the most suitable alternative energy source for the SWL circulation system application.

The cost savings through solar offsets are included in the *Table 1* figures below.

Annual Operating and Maintenance Cost for Circulation System						
Including Solar Offset						
Circulation system - Phase 3 (Lakes SWL 1, 2 and 3 Operational)						
Item		Description	Qty	Unit	Rate	Amount
Energy Costs						
	Pumps	2 x 170kW Pumps	1,008,520	kW-h	$ 0.37	$ 373,152
		Solar Offset per Enerven report at **Appendix Q**				-$ 208,000
					Sub-total	$ 165,152
Monitoring costs						
	Operator Attendance	Facility Inspections	416	Man-hrs	$ 120.00	$ 49,920
	Water Quality	Sampling and Testing	12	Mth	$ 1,500.00	$ 18,000
					Sub-total	$ 67,920
Maintenance Costs						
	Pumps	Maintenance and component replacement	2	Each	$ 60,000.00	$ 24,000
	Valves	Maintenance and component replacement		Item		$ 6,000
					Sub-total	$ 30,000.00
					Cost per Annum	**$ 263,072**

Table 1 – SWL Circulation System Costs

1.6. Comparative Operation and Maintenance Costs

Whilst the annual maintenance costs are predictably higher for the SWL given the larger lake surface area compared to the original smaller freshwater lake, the most notable difference is the cost of maintaining the originally proposed floodway channels.

The reduction in floodways and introduction of 'parkland links' in the proposed SWL option generally provides for more cost-effective maintenance.

The comparison of the ultimate annual operation and maintenance costs are summarised in *Table 2*.

	Original Floodways Proposal		Proposed Salt Water Lake	
Items	Components	Amount	Components	Amount
1	Floodway Areas	$ 6,071,987	Floodway and Parkland links	$ 2,293,893
2	Maintenance 3.5 Ha Freshwater Lake	$ 194,904	Maintenance 40.3 Ha Salt Water Lake	$ 507,356
3	Lake Management	$ 98,142	Lakes Management	$ 229,687
		$ 6,365,032		$ 3,030,936
			Cost Saving	$ 3,334,096

Table 2 – Comparison of Annual Operational and Maintenance Costs

1.7. Quantitative Research

Hudson Howells, Strategic Management Consultants, were engaged by Walker to undertake qualitative research to gain an understanding of the social impact of the SWL system on the local and broader communities as the potential future residents of, and visitors to, Riverlea.

The survey findings have demonstrated beyond doubt that the local and broader communities strongly prefer the SWL system option (93% preference) over the 'floodway' network option (7% preference).

1.8. BDO EconSearch Cost Benefit Analysis

BDO EconSearch were engaged by Walker to carry out financial modelling in order to establish the cost benefit to Council of the proposed SWL system compared with the originally proposed floodway stormwater and flood mitigation network.

The results of the financial modelling show a $38.4m (NPV) nett benefit to Council over a 25 year period of analysis as presented in *Table 3*.

	Expected Council Benefit		
	No lakes	With lakes	Net benefit of lakes
Rate income	147.46	198.96	51.50
Residual capital value	0.00	2.35	2.35
Provision of Council Services	-147.46	-178.69	-31.23
Capital replacement costs	0.00	-0.06	-0.06
Maintenance costs	-32.60	-16.77	15.84
Total	**-32.60**	**5.80**	**38.40**

Source: BDO EconSearch analysis

Table 3 – Summary Cost Benefit Analysis

1.9. Transfer of Ownership, Operation & Maintenance

The following model is proposed for transfer of Ownership, Operation & Maintenance of each Phase of the SWL system.

Upon reaching Practical Completion (PC) of the respective Phase 'Construction Scope' contract works, it is proposed that the SWL Phase be vested to Council as a 'reserve'.

The SWL 'reserve' would include the SWL Phase water body, edge treatment and an agreed curtilage width to designate the SWL extent, excluding larger lake side landscape reserves that would be managed under alternate arrangements.

Operation and maintenance of each SWL Phase will be carried out by Walker and their construction contractors until the end of the Construction Scope contract 12 month Defects Liability Period (DLP) when Final Completion (FC) is achieved.

The operation and maintenance of each SWL Phase is proposed to continue under Walker 'cost and control', on behalf of Council, for a further four (4) years, during which Walker would carry the liability for the performance of each respective Phase of the SWL system including the associated external infrastructure.

This would include the cost for any system failures and/or repairs to maintain the designed performance.

During this time Walker will also maintain the associated landscape within the SWL curtilage width.

After five (5) years from the date of the SWL Phase construction contract PC, and upon rectification of any known system defects (with the exception of normal wear and tear), Council would assume the operation and maintenance of the system from Walker, relieving Walker of any further liabilities.

Council will continue the established 'Walker standard' maintenance regime from this time forward.

1.10. Recommendation

The research and analysis detailed above favours the SWL proposal as the superior solution compared to the original freshwater lake and floodways proposal on the basis of the following:

- The SWL proposal results in provision of high-quality amenity for the benefit and wellbeing of both the local Riverlea residents and the broader community
- There is a nett financial benefit to Council through achieving higher rates for properties at Riverlea as a result of the increased amenity and value provided by the SWL
- The SWL proposal results in a more cost-effective solution for operation and maintenance of the stormwater and flood mitigation system for Council as the long term owner of the assets

It is therefore recommended that –

1. Council approve the proposal for the Salt Water Lakes (SWL) system to be incorporated into the Riverlea Master Plan
2. Support Walker to move to the development of detailed engineering design and approval of the SWL system for the staged construction of the system
3. Support Walker in the preparation of formal arrangements between Walker and Council for the long-term delivery, transfer, ownership and maintenance of the SWL system.

2. Background

2.1. History

Riverlea was declared by the Minister of Planning as a project of state significance on 5 June 2003.

The declaration was made on the basis that Riverlea was considered to be of economic, social and environmental importance to South Australia.

The declaration was subsequently varied on 2 occasions, 4 January 2007 and 12 June 2008, to reflect the expansion of the project size and scope.

The original approved Master Plan for the Riverlea project incorporated a 3.5 Ha freshwater lake with a network of linear stormwater channels (*floodways*) across the project site for stormwater management and flood mitigation. *(Refer Figure 1)*

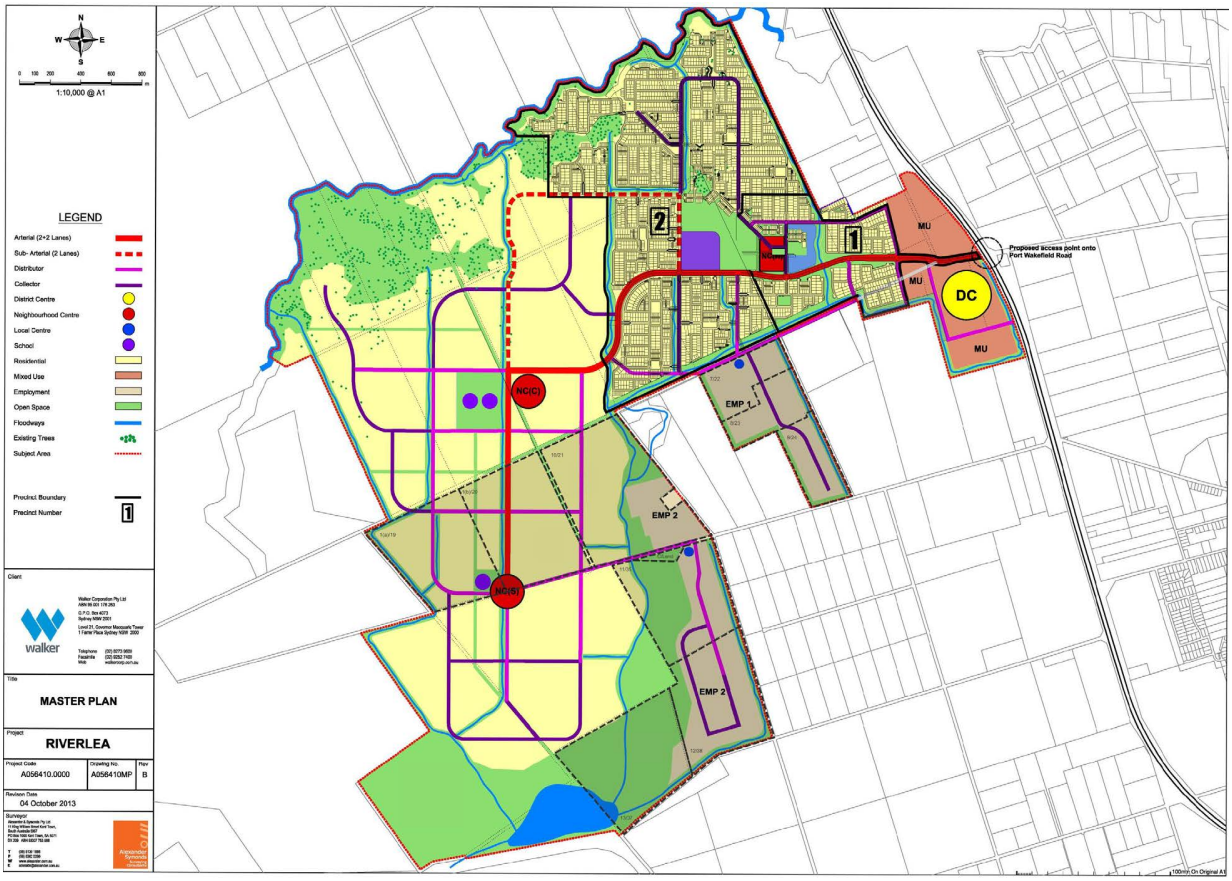


Figure 1 – Original Riverlea Master Plan (Appendix B)

2.2. Current Riverlea Master Plan

Walker Corporation (*Walker*) now proposes a 40 Ha salt water lake system (*SWL*) to be incorporated into the stormwater management and flood mitigation system, as well as providing significant positive contribution to the amenity of the Riverlea public realm. The SWL will be the centrepiece of Riverlea. *(Refer Figure 2)*

In order to gain approval from State Planning Authority (*PLUS*) and City of Playford (*Council*), a 3 Phase process has been agreed between Walker Corporation and Council, which is intended to culminate in securing Council's approval to ultimately own and operate the SWL in perpetuity.

The first two of the approval Phases - the 'endorsement' phases - have been completed, with Council formalizing their 'endorsement' to proceed to Phase 3 of the approval process via a letter to Walker Corporation dated 22 August 2022.

*Refer **Appendix A** – Council Endorsement of Phase 2 Report.*

Through the 'endorsement' phases, Walker in conjunction with its various Consultants, presented a range of design documents and other research documents which dealt with the engineering aspects, construction methodology, operational and maintenance matters associated with the SWL

This report constitutes Phase 3 of the process and provides additional information describing the merits of the Riverlea SWL, as well as a structure for the transfer to, and ongoing ownership by Council, including details relating to long term operation and maintenance of the system.

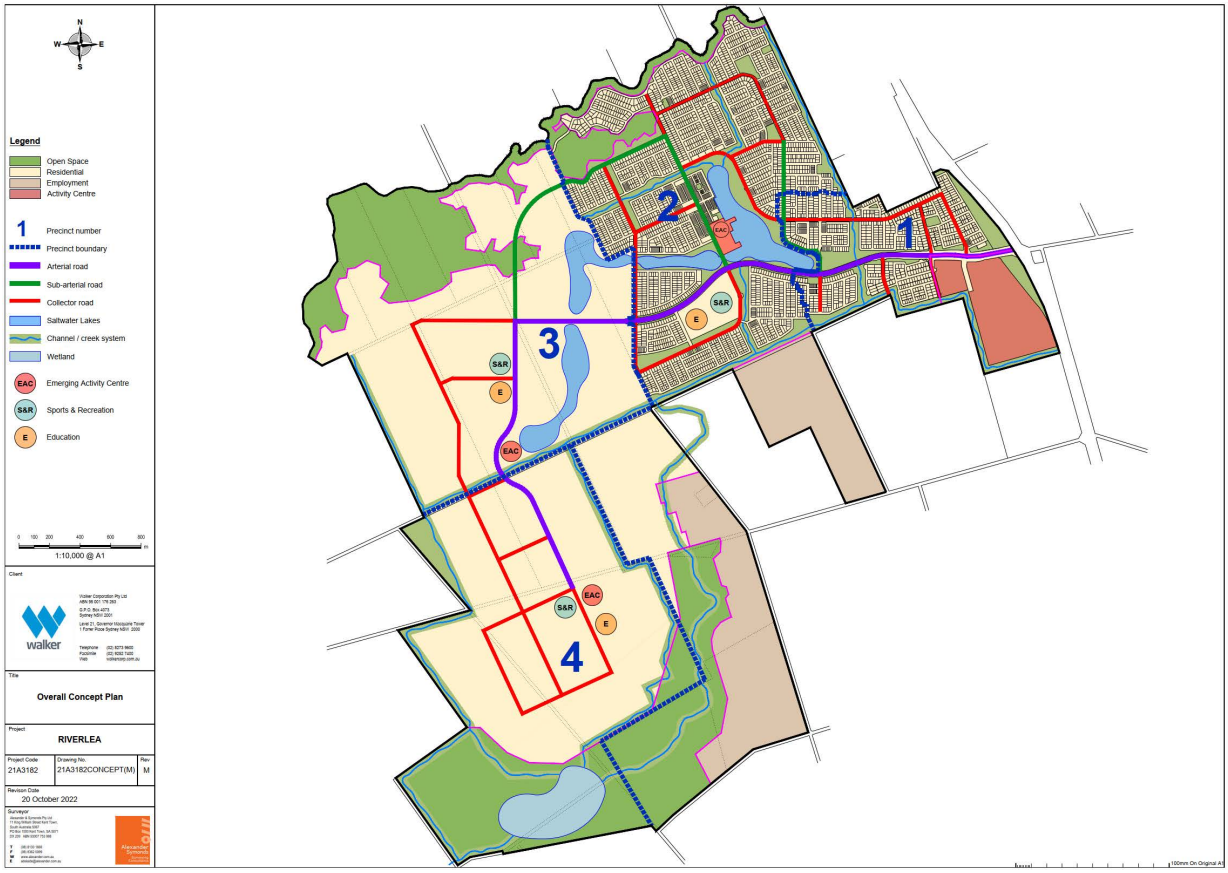


Figure 2 – Proposed Riverlea Master Plan (Appendix C)

Upon approval of this Phase 3 report, Walker will prepare fully detailed engineering designs and specifications and seek formal engineering approval from Council to commence construction of the SWL.

To meet the current rate of sales and development of the project, the construction of Phase 1 of the SWL is expected to be started in October 2023.

2.3. Riverlea Marketing Master Plan

Riverlea is a $3 billion project which will be delivered over a period of approximately 25 years.

The master planned community covers an area of some 1,340 Ha and will deliver up to 12,000 residential properties which will be home to approximately 33,000 residents, and is currently the largest residential master planned community in South Australia.

In terms of scale, Riverlea will have a population 18% greater than Mt Gambier.

It is anticipated Riverlea will create in the order of 10,000 jobs through various construction activities and through its various employment zones.

The project has sold over 950 lots since Jan 2021 and currently supply is not keeping pace with demand.

Riverlea will ultimately become a key centre supported by many social, community and commercial facilities including schools, retail precincts, sports precincts, a public transport system, health and community facilities, lifestyle precincts, employment zones and approximately 450 Ha of open space including the 40 Ha SWL system. *(Refer Figure 3)*

Figure 3 – Riverlea Marketing Master Plan (Appendix D)

Located approximately 30 kilometres north of the Adelaide CBD, Riverlea lies within the newly created suburb of Riverlea Park (formerly known as Buckland Park) and within the Local Government boundaries of the City of Playford.

Riverlea is bounded by the Port Wakefield Highway to the east, Gawler River to the north, Buckland Dry Creek Pty Ltd salt lakes and Windemere Homestead to the west and Thompson Road to the south.

3. Salt Water Lakes System

Walker delivers master planned communities which are designed to create positive social environments, enhance community culture, and promote healthy lifestyles. This is achieved in part by providing high quality public realm which has a real and tangible benefit to the whole community.

The Riverlea Master Plan now includes a 40 hectare 'activated' SWL system as part of the public realm and is the centrepiece and 'heart' of the project.

The SWL system is a major component of the project and plays a key role in the stormwater management and flood mitigation strategy as well as offering visual amenity and lifestyle and recreational opportunities.

3.1. Salt Water Lakes General Description

The SWL system comprises three (3) main lake water bodies *(Phases)* and a comprehensive pumped intake and outlet circulation system.

The circulation system allows for salt water to be pumped from Gulf St Vincent to the upper reaches of each of the SWL Phases via a pipe network. The salt water then flows through the respective SWL Phases and returns under gravity back to Gulf St Vincent via a network of pipes and open channels.

In conjunction with this, the shape of the perimeter of the lakes ensures that there are no 'trapped water' or 'still water' zones within the lakes. There is a complete changeover of salt water in the lakes over a period of 40 days through the active circulation system.

The depth of the lakes is 3m from standing water level to the lake floor level. The lakes floor consists of a 500 mm thick clay liner which will contain the salt water within the lakes and prevent seepage.

In times of major storm events, there is additional capacity above the standing water level to temporarily accommodate stormwater inflows to deal with the 1 in 100 year storm event. This is a key feature of the stormwater management system for Riverlea. The detained stormwater is then gradually released at a controlled rate through the outlets and channel / pipe system into Thompsons Creek and ultimately out to Gulf St Vincent. In a significant rain event the circulation system is designed to flush the influx of stormwater out of the lakes over a period of 10 to 15 days by temporarily increasing the inflow of salt water to displace the stormwater.

The rock lining over geotextile protects the lake edges from wind and wave action which mitigates 'fretting' of the lake edges. The rock lined edges also provide a safety zone for anyone entering and exiting the water either for maintenance purposes or recreational purposes.

3.2. Salt Water Lakes Phases

For the purpose of this report the designation of the water bodies is as follows:

SWL 1 - Phase 1

SWL 2 - Phase 2

SWL 3 - Phase 3

Designation of the SWL water bodies and key design attributes of the SWL system are described in Figures 4 and 5 below.

Figure 4 – Riverlea SWL Designation Plan (Appendix E)

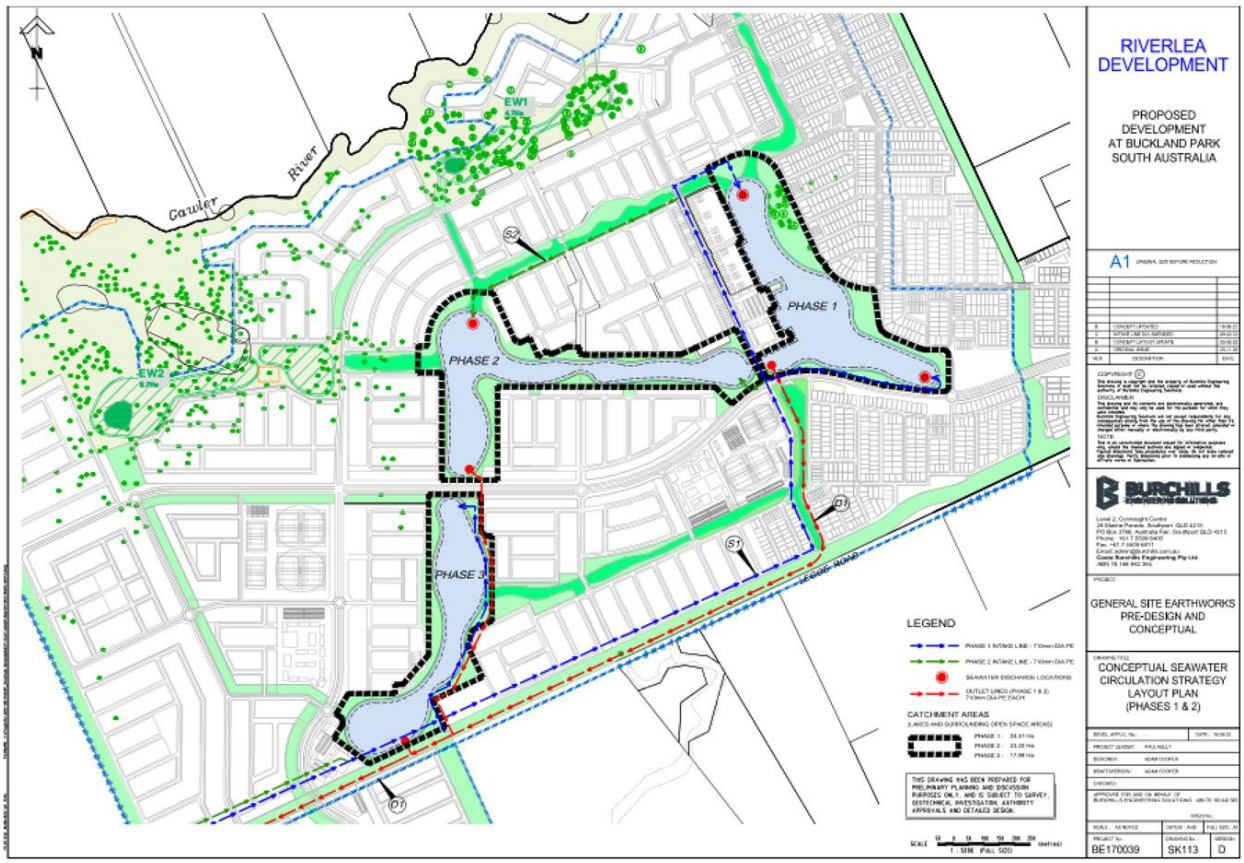


Figure 5 – Riverlea SWL Phases Plan (Appendix F)

3.3. Salt Water Lakes Phases

The source of salt water is via the tidal Chapman Creek which is located at Gulf St Vincent approximately 8.5 km to the west of the Riverlea project entrance on Port Wakefield Highway. *(Refer Figure 6)*

Walker proposes to establish an intake pump station at Chapmans Creek which will house an automated pumping system to draw sea water from Chapman Creek and pump it through a dual pipeline to the various SWL Phases.

The salt water will then flow under gravity essentially from northeast to southwest, ultimately discharging via a network of pipe systems and outfall channels into Thompsons Creek further to the south and ultimately returning the water to Gulf St Vincent approximately 2 km to the south of the Chapman Creek intake pump station.

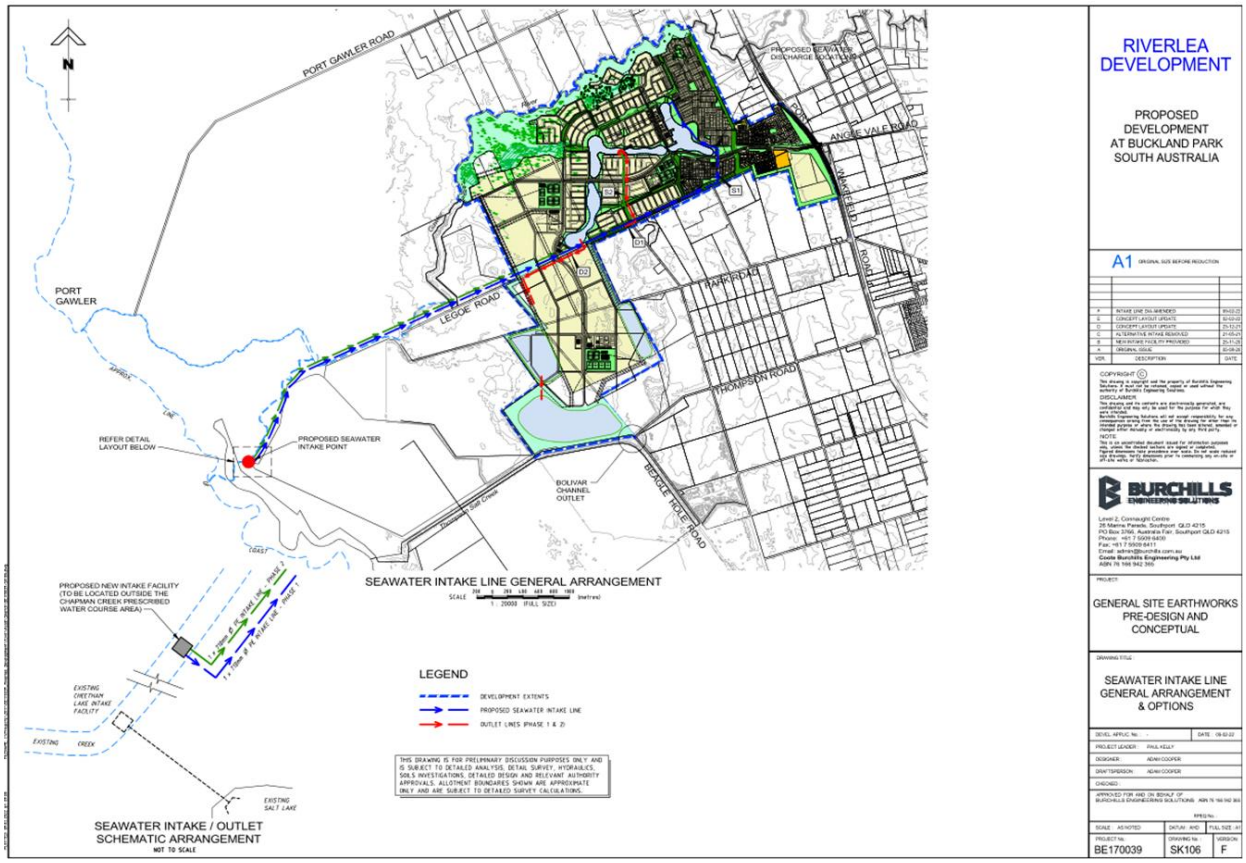


Figure 6 – Riverlea SWL Circulation System External Infrastructure Plan (Appendix G)

4. Delivery Sequence and Construction Scope

4.1. SWL - Construction Program

Given the scale of the project, it is intended to stage the construction of the SWL system over an approximate 15 year period, with each Phase being delivered at approximately 5 year intervals. This means the SWL Phases will be designed to operate independently of one another.

Phase 1 of the SWL system is currently scheduled to commence in October 2023 to take advantage of the drier and warmer months from October to April. Construction will commence upon receipt of Council approval of the detailed engineering design and specifications.

Although estimated to be at 5 year intervals, the final timing of construction for Phase 2 (SWL 2) and Phase 3 (SWL 3) will be determined based on the rate of development of the residential subdivision areas which is driven by marketplace sales rates.

*Refer **Appendix I** for proposed Program of SWL Construction Scope Works.*

4.2. SWL - Construction Scope

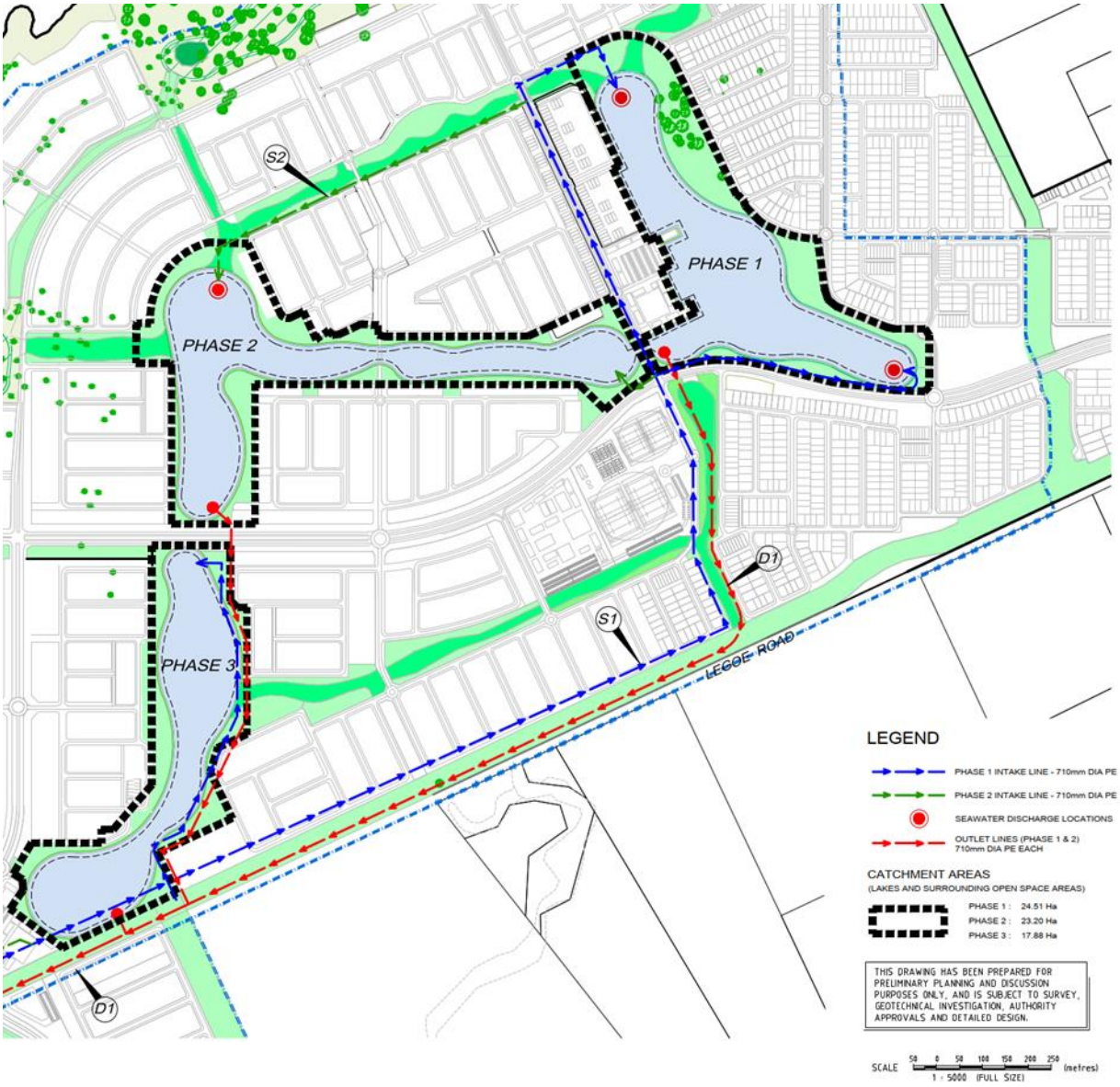


Figure 7 – Riverlea SWL Intake and Outlet Line Detail Plan (Appendix F)

The full scope of the SWL work includes the following components located within the project area *(Refer Figure 7 & Figure 8)*:

- Three (3) salt water lake bodies (Phases)
- Clay lining to floors of each lake Phase
- Intake structures at lake Phases for supply water including valves and weirs
- Outlet structures at lake Phases for outflow water including valves and weirs
- Edge treatments of various types to each lake Phase
- Peripheral passive stormwater treatment systems for treatment of stormwater prior to entering the lake Phases
- Public realm landscape to perimeter of the lakes within the defined SWL Phase curtilage

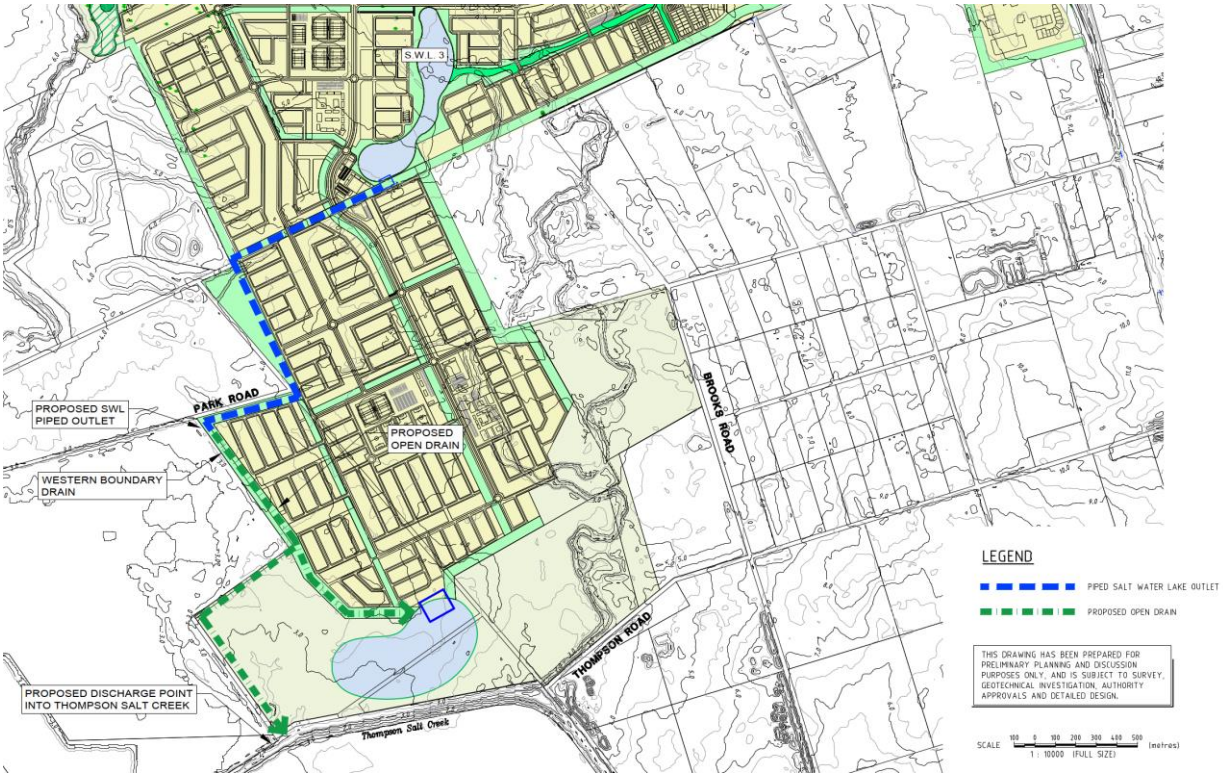


Figure 8 – Riverlea SWL Outlet Detail Plan (Appendix G)

The full scope of the SWL work also includes the following components located external to the project area *(Refer Figure 9)*:

- Chapman Creek intake pumping station incorporating two salt water delivery pumps including valves and pipework
- Energy supply including grid connected supply and a solar system (panels and inverter) and associated facilities for pumps
- Supply pipework system from Chapman Creek intake pumping station to each lake Phase
- Outflow pipework and outfall channels from the lake Phases to Thompsons Creek

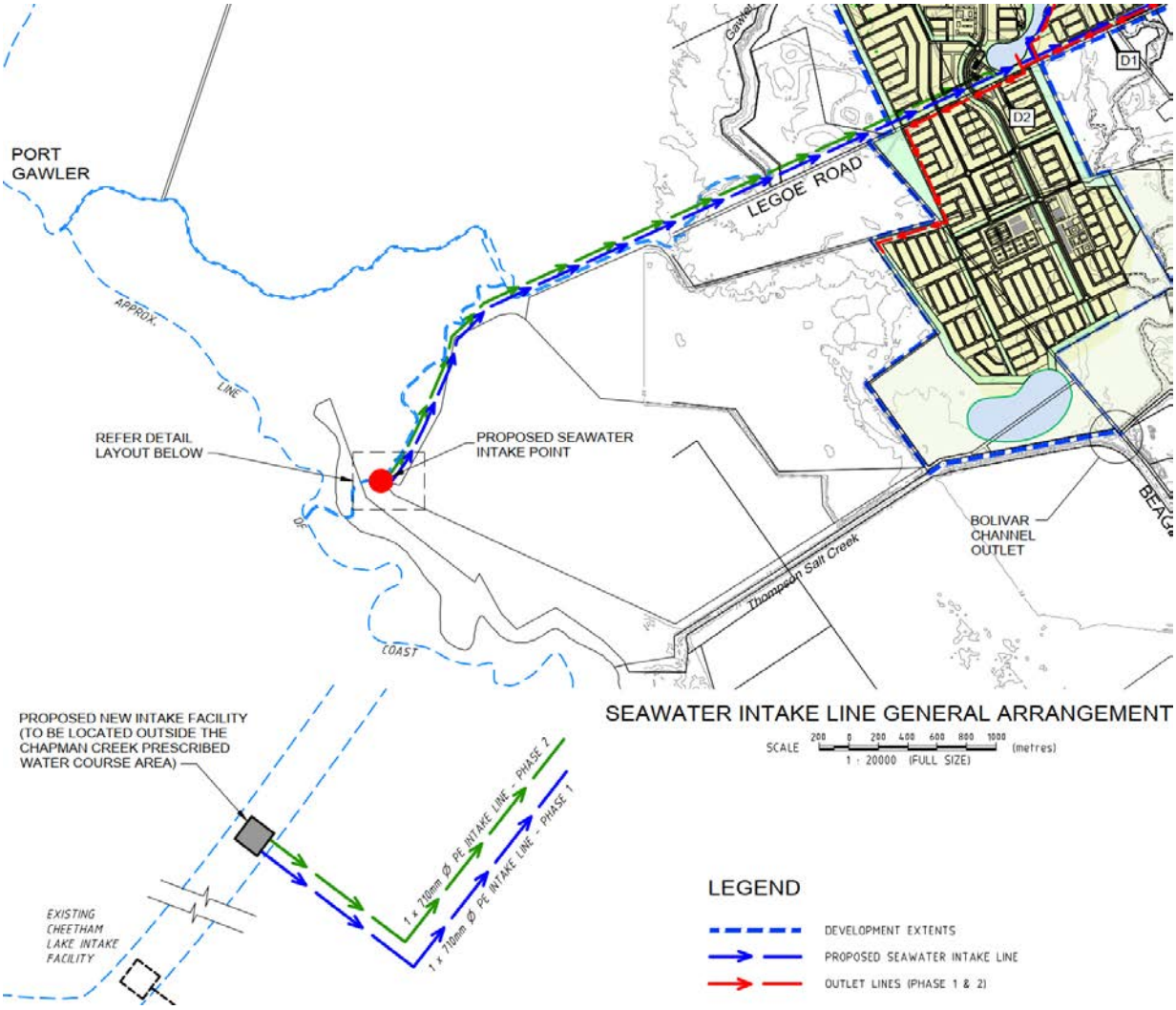


Figure 9 – Riverlea SWL Outlet Detail Plan (Appendix H)

4.3. Phase 1 (SWL 1) - Construction Scope

Phase 1 (SWL 1) is an integral component of the stormwater management and flood mitigation of residential subdivision stages constructed in Precinct 2.

Phase 1 is the largest phase (24.5 Ha) and most comprehensive in terms of delivery of key components for the ultimate SWL system. The Phase 1 lake includes the following:

- The largest lake water body
- Clay lining to floor
- Lake edge treatments of various types including Neighbourhood Centre precinct
- Intake structures for supply water including valves and weirs
- Outlet structures for outflow water including valves and weirs
- Peripheral passive stormwater treatment systems for treatment of stormwater prior to entering Phase 1 (SWL 1) from Precincts 1 and 2
- Public realm landscape to perimeter of the lakes within the defined SWL Phase 1 curtilage

Phase 1 works will also include the construction of external infrastructure as follows:

- Chapman Creek intake pumping station
- Two salt water delivery pumps including valves
- Energy supply (both grid supply and solar system) and associated facilities for pumps
- Supply pipework system from Chapman Creek intake pumping station through Crown Land and along the Legoe Road corridor to the Phase 1 lake.
- Outflow pipework and outfall channels to Thompsons Creek

Located entirely within Precinct 2, Phase 1 lake is the furthest from the Chapman Creek sea water source and has the highest standing water level to provide the necessary head for the gravity outflow to Thompsons Creek. *(Refer to Figure 10)*

The supply and outflow pipework and channel system constructed for Phase 1 will ultimately supply Phase 2 and 3 of the SWL system.

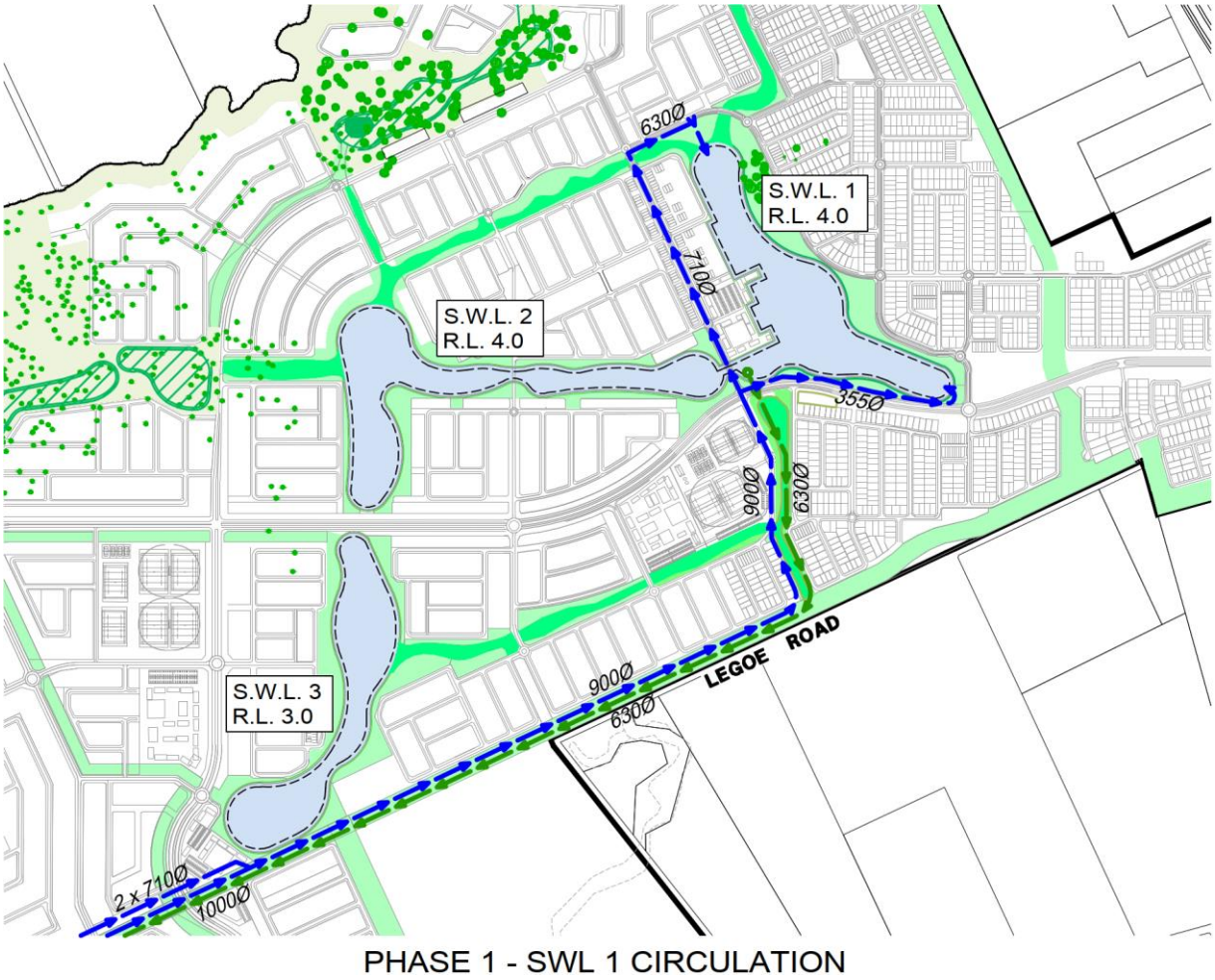


Figure 10 – Phase 1 Plan (Appendix J)

Circulation Pipe Inflow Lines:

a. Install the twin (2 of) 710mm dia. PE100 supply lines from Chapman Creek Intake to the western boundary of the site and cap one of these lines. Only one of the two (2) 710mm dia. Supply lines are operational during Phase 1.

b. Extend a single larger 900mm line within and parallel to the Legoe Road Channel parkland corridor to the north. Further extend the line north to the SWL1 /SWL 2 junction point. Note that this line may be a duplication of smaller line sizes.

c. Extend a 710mm single line along north to the western side of SWL 1 to the northern end, reduce the line size to 630mm to become the primary supply point for SWL 1 – Phase 1.

d. Install a smaller secondary 355mm line along the southern side of the lake to the eastern extent of SWL 1 to discharge into the isolated end of the lake to ensure whole of lake circulation.

Circulation Pipe Outflow Lines:

a. Construct an open channel parallel to the western property (zig-zag) boundary to the proposed piped single 1000mm dia. PE100 outlet.

b. Install a single 1000mm dia. PE100 outlet line from the proposed piped outlet into the western boundary channel to southern end of the future SWL 3 location.

c. Extend a single 630mm dia. line from this future SWL outlet location parallel to the Legoe Road Channel through the parkland corridor to the east. Extend the line north to SWL 1 east of the SWL 2 junction point to become the primary outlet for SWL 1 – Phase 1.

4.4. Phase 2 (SWL 2) – Construction Scope

Located across both Precinct 2 and Precinct 3, Phase 2 (23.2 Ha) links the two other SWL water bodies by flowing west from Phase 1 then south to the intersection with Riverlea Boulevard in Precinct 3. *(Refer to Figure 11)*

Phase 2 uses branch inlets from the Phase 1 pipework system to the northern most and eastern most reaches to provide its own supply from the Chapman Creek sea water source and has the same finished water level as Phase 1 to provide the necessary head for the gravity flow and discharge.

Phase 2 comprises primarily the lake body itself and the associated branch supply and discharge pipework connecting to the pipework system constructed in Phase 1, but includes the following:

- The lake water body
- Clay lining to the floor
- Lake edge treatments of various types
- The branch supply pipework system to Phase 2 lake intake structure from the Phase 1 lake pipework system including valves and weirs
- The branch outlet pipework from the Phase 2 lake outlet structure to the Phase 1 discharge pipework system, including valves and weirs
- Peripheral passive stormwater treatment systems for treatment of stormwater prior to entering Phase 2 (SWL 2) from Precincts 2 and 3
- Public realm landscape to perimeter of the lakes within the defined SWL Phase 2 curtilage

Circulation Pipe Inflow Lines:

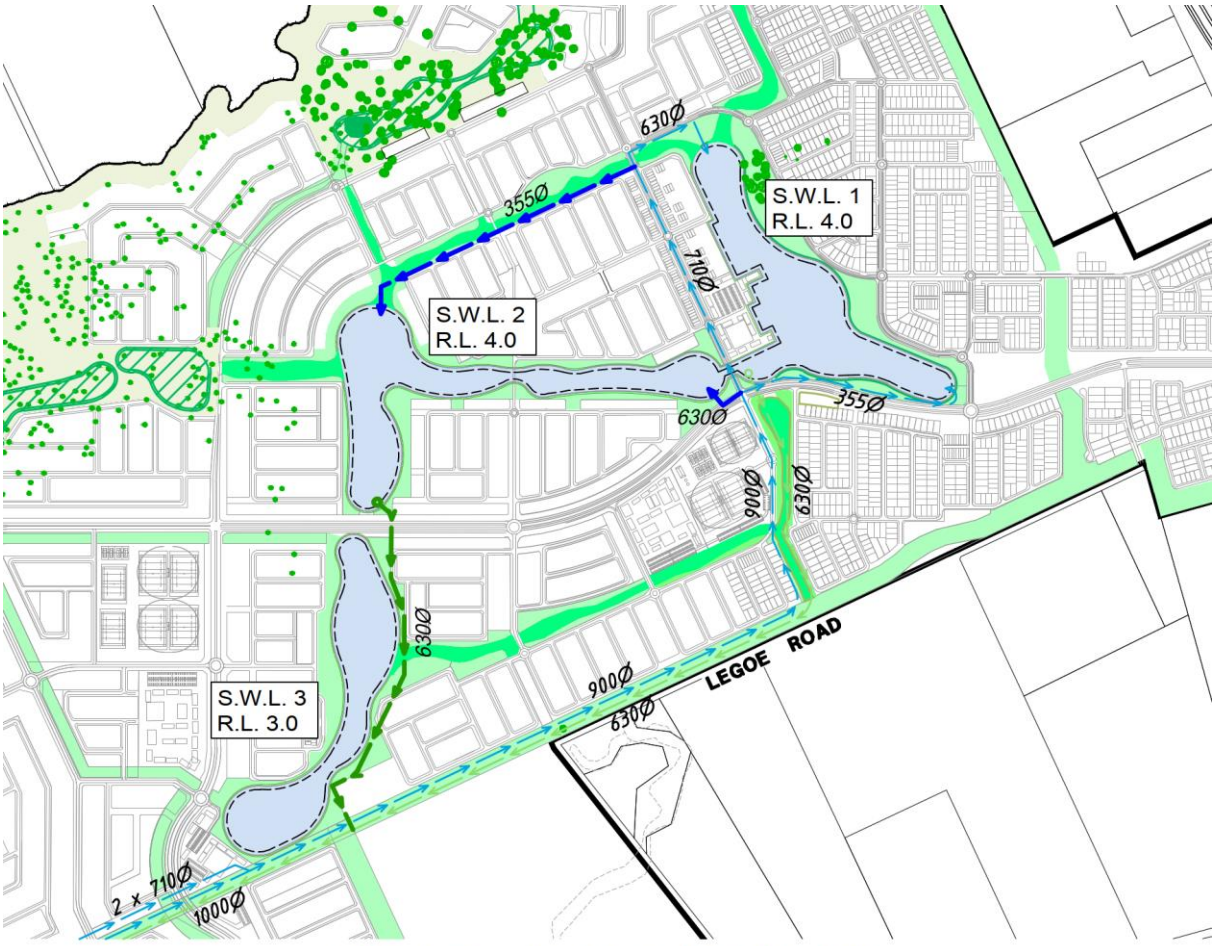
a. Link a 630mm dia. stub from the single 900mm line to the head of SWL 2 to become the primary supply point into the SWL 2 – Phase 2.

b. Extend a 355mm line west from the northern end of the SWL main supply line extending to the SWL 2 knuckle to the west to ensure whole of lake circulation.

c. Note that the two (2) 710mm dia. Supply lines become operational for the Phase 2 works.

Circulation Pipe Outflow Lines:

a. Link a 630mm dia. stub from the single 1000mm outlet line extending north to the bottom of SWL 2 as the primary outlet for SWL 2 – Phase 2.



PHASE 2 - SWL 1 & 2 CIRCULATION

Figure 11 – Phase 2 Plan (Appendix J)

4.5. Phase 3 (SWL 3) – Construction Scope

Located in Precinct 3, Phase 3 (17.88 Ha) completes the SWL system flowing south from Phase 2 at the intersection with Riverlea Boulevard to the Legoe Road alignment. *(Refer to Figure 11)*

Phase 3 uses a branch inlet from the Phase 1 pipework system to the northern most reaches to provide its own supply from the Chapman Creek source and has a finished water level 1.0m lower than Phase 1 & 2, but still has the necessary head for gravity flow and outlet to Thompsons Creek given the short outlet pipe branch length.

Phase 3 comprises primarily the lake body itself and the associated branch supply and discharge pipework connecting to the pipework system constructed in Phase 1, but includes the following:

- The lake water body
- Clay lining to the floor
- Lake edge treatments of various types
- The branch supply pipework system to Phase 3 lake intake structure from the Phase 1 lake pipework system including valves and weirs
- The branch outlet pipework from the Phase 3 lake outlet structure to the Phase 1 discharge pipework system, including valves and weirs
- Peripheral passive stormwater treatment systems for treatment of stormwater prior to entering Phase 3 (SWL 3) from Precincts 3

- Public realm landscape to perimeter of the lakes within the defined SWL Phase 3 curtilage

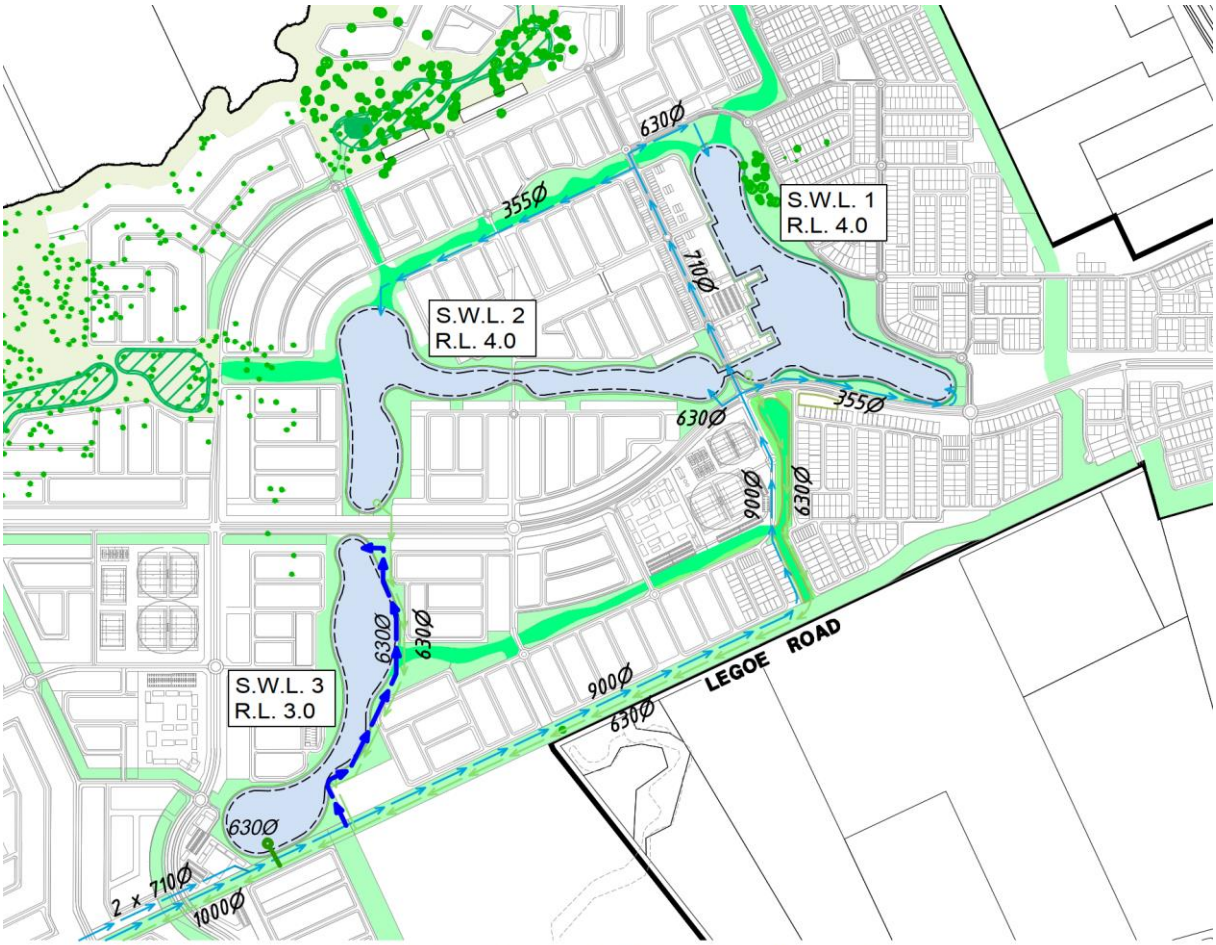


Figure 12 – Phase 3 Plan (Appendix J)

Circulation Pipe Inflow Lines:

d. Link a 630mm dia. stub from the single 900mm line (serving SWL 1 and SWL 2) to become the primary supply point for SWL 3 – Phase 3.

Circulation Pipe Outflow Lines:

b. Link a 630mm dia. stub from the single 1000mm outlet line to the bottom of SWL 3 as the primary outlet for SWL 3 – Phase 3.

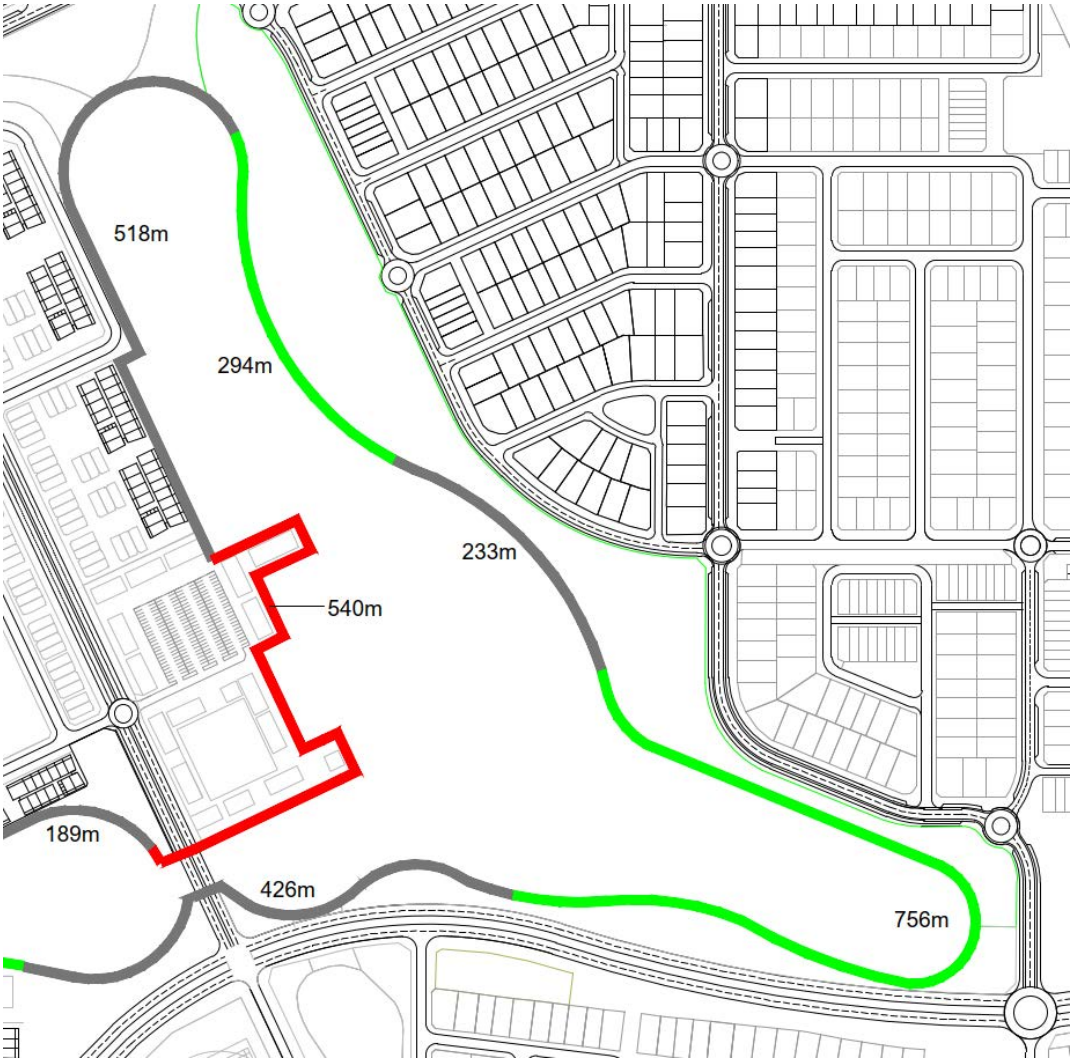
4.6. Lake Edge Treatments and Clay Liner

Lake Edge
A variety of low maintenance edge treatments are proposed for the lakes ranging from rock lining, natural plantings and localized formal structural edges.

The presented extent and configuration of the edge treatments are based on the intended end use of the lake curtilage and adjacent reserves etc., but will be subject to further design development. Estimated capital costs have been derived from the following layout. *(Refer Figure 12 & Figure 13)*

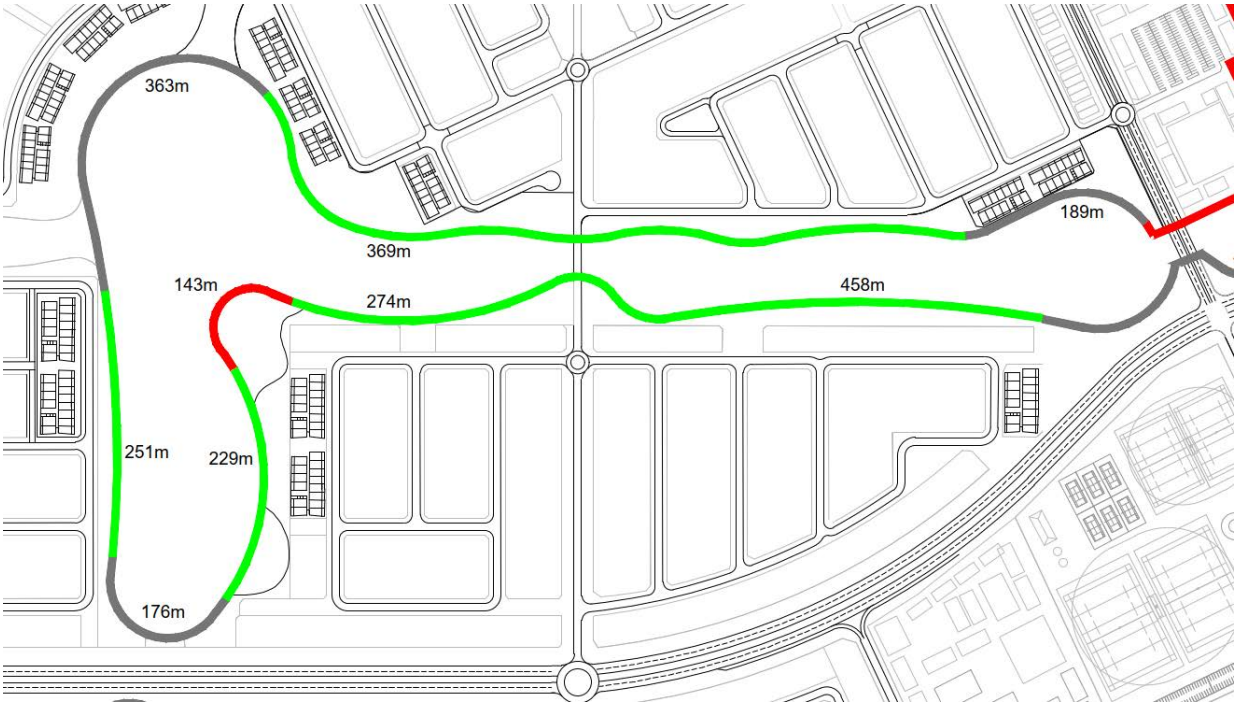
*Refer **Appendix K** – Proposed Lake Edge Treatments and Clay Liner*

The following represents the indictive distribution of the various lake edge treatments that will be developed through the detailed design phase.

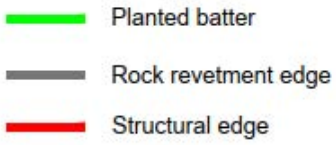


SWL 1 – EDGE TREATMENT TYPE AND EXTENT

Figure 13 – Edge Treatment (Appendix K)



SWL 2 and SWL 3 – EDGE TREATMENT TYPE AND EXTENT



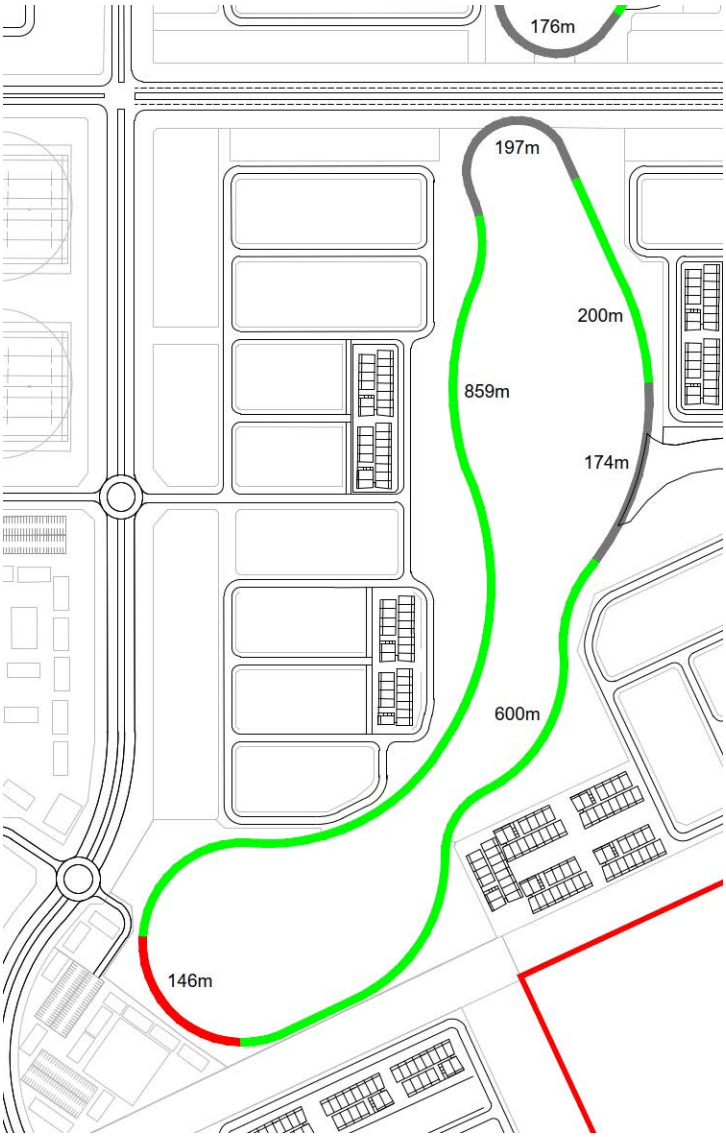


Figure 14 – Edge Treatment (Appendix K)

Clay Liner

A 500 mm thick impervious clay liner will be constructed in the floor of the lakes to contain the salt water within the lake bodies.

The liner will extend under the rock lined edge treatments and will terminate above the standing water level of the lakes.

Geotechnical studies have shown there is an abundance of suitable clay material available within the Riverlea site for this purpose.

The image below shows a typical detail of the clay liner. Further technical detail will be provided in the detailed engineering design phase.

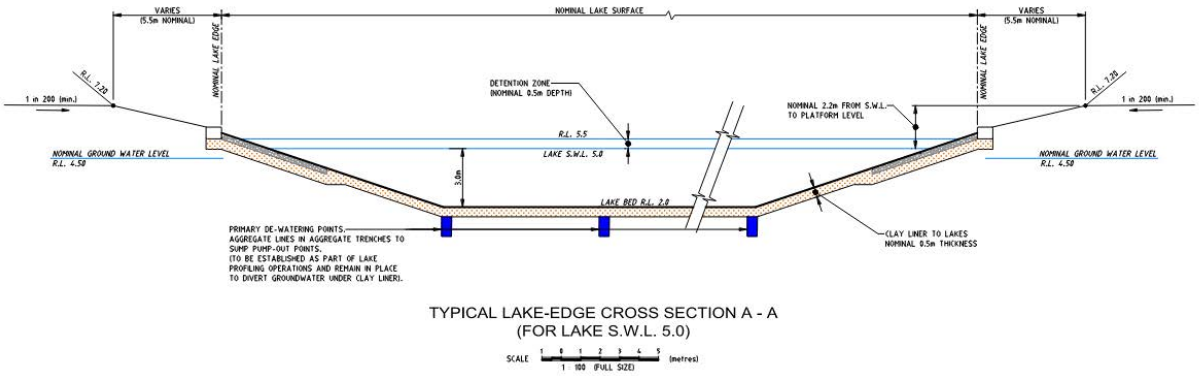


Figure 15 –Clay Liner (Appendix K)

A cost estimate has been undertaken by WM Developments with the total cost being $11,297,520.

The following table provides a cost breakdown of the capital expenditure associated with construction of the clay liner.

RIVERLEA - Saltwater Lakes				Cost Estimate for the Installation of the Clay Liner				
Item	**Description**			**Quantity**	**Unit**	**Rate**	**Amount**	**Comment**
1	**Construction of the SWL Clay Liner**							
	a)	Lake bulk earthworks		Bulk earthworks cost accounted for in subdivision costs				incl. over-excavation to 0.5m below the designated lake base level.
	b)	Preparation of the liner subgrade		211,600	m2	$ 4.00	$ 846,400	Lake area = 40.4 Ha x 1.05 batter factor = 42.3 Ha.
	c)	Installation of Subsoil Drains		0.6	lm/m2 lake	$ 20.00	$ 2,539,200	
	d)	Clay Liner Eartworks						
		(i)	Bottom layer (0.25m thick) -	105,800	m3	$ 25.00	$ 2,645,000	Sourced within 1.0km
			win, load, cart, place, condition and compact					
		(ii)	Upper layer (0.25m thick) -	105,800	m3	$ 25.00	$ 2,645,000	
			win, load, cart, place, condition and compact					
		(iii)	Allowance for sourcing elsewhere on	105,800	m3	$ 5.00	$ 529,000	the clay liner to be sourced
			within 3.0km of siteworks.					elsewhere within the broader
2	**Dewatering**			210	day	$ 1,000.00	$ 210,000	Allopwance of 70 days per lake (3 x lakes = 210 days).
							$ 9,414,600	
			Contingency @	20%			$ 1,882,920	
						Total	**$ 11,297,520**	Excl. GST

Table 4 – Capital expenditure of clay liner.

5. Ownership and Maintenance Structure

It is intended that Walker will vest the completed SWL system including the external infrastructure assets to Council under similar arrangements to other project related assets such as roads, stormwater management systems and public realm reserves, where Council accept the transfer of ownership and ultimately operate and maintain the assets in perpetuity.

Walker will therefore contribute the capital cost for constructing all three (3) Phases of the SWL system including the external infrastructure, in conjunction with other development works on the project.

As previously noted, given the scale of the SWL project, the three Phases of the SWL system construction will be staged over a period of approximately 15 years.

It is proposed the following structure be established for the transfer of ownership and maintenance to Council:

5.1. Phase 1 (SWL 1) – Transfer of Ownership, Operation & Maintenance

Upon reaching Practical Completion (PC) of the Construction Scope contract works, it is proposed that the Phase 1 SWL works be vested to Council as a 'reserve'.

The Phase 1 SWL 'reserve' would include the Phase 1 water body, edge treatment and an agreed curtilage width to designate the Phase 1 extent, excluding larger lake side landscape reserves to the east that would be managed under alternate arrangements.

Operation and maintenance of Phase 1 will be carried out by Walker and their construction contractors until the end of the Construction Scope contract 12 month Defects Liability Period (DLP) when Final Completion (FC) is achieved.

The operation and maintenance of Phase 1 is proposed to continue under Walker 'cost and control', on behalf of Council, for a further four (4) years, during which Walker would carry the liability for the performance of Phase 1 of the SWL system including the associated external infrastructure.

This would include the cost for any Phase 1 system failures and/or repairs to maintain the designed performance.

During this time Walker will also maintain the associated landscape within the Phase 1 SWL curtilage width.

After five (5) years from the date of the Phase 1 construction contract PC, and upon rectification of any known system defects (with the exception of normal wear and tear), Council would assume the operation and maintenance of the system from Walker, relieving Walker of any further liabilities.

Council will continue the established 'Walker standard' maintenance regime from this time forward.

5.2. Phase 2 (SWL 2) – Transfer of Ownership, Operation & Maintenance

Upon reaching Practical Completion (PC) of the Construction Scope contract works, it is proposed that the Phase 2 SWL works be vested to Council as a 'reserve'.

The Phase 2 SWL 'reserve' would include the Phase 2 water body, edge treatment and an agreed curtilage width to designate the Phase 2 extent, excluding larger lake side landscape reserves to the east and north that would be managed under alternate arrangements.

Operation and maintenance of Phase 2 will be carried out by Walker and their construction contractors until the end of the Construction Scope contract 12 month Defects Liability Period (DLP) when Final Completion (FC) is achieved.

The operation and maintenance of Phase 2 is proposed to continue under Walker 'cost and control', on behalf of Council, for a further four (4) years, during which Walker would carry the liability for the performance of Phase 2 of the SWL system.

This would include the cost for any Phase 2 system failures and/or repairs to maintain the designed performance.

During this time Walker will also maintain the associated landscape within the Phase 2 SWL curtilage width.

After five (5) years from the date of the Phase 2 construction contract PC, and upon rectification of any known system defects (with the exception of normal wear and tear), Council would assume the operation and maintenance of the system from Walker, relieving Walker of any further liabilities.

Council will continue the established 'Walker standard' maintenance regime from this time forward.

5.3. Phase (SWL 3) – Transfer of Ownership, Operation & Maintenance

Upon reaching Practical Completion (PC) of the Construction Scope contract works, it is proposed that the Phase 3 SWL works be vested to Council as a 'reserve'.

The Phase 3 SWL 'reserve' would include the Phase 3 water body, edge treatment and an agreed curtilage width to designate the Phase 3 extent, excluding larger lake side landscape reserves to the east and west that would be managed under alternate arrangements.

Operation and maintenance of Phase 3 will be carried out by Walker and their construction contractors until the end of the Construction Scope contract 12 month Defects Liability Period (DLP) when Final Completion (FC) is achieved.

The operation and maintenance of Phase 3 is proposed to continue under Walker 'cost and control', on behalf of Council, for a further four (4) years, during which Walker would carry the liability for the performance of Phase 3 of the SWL system.

This would include the cost for any Phase 3 system failures and/or repairs to maintain the designed performance.

During this time Walker will also maintain the associated landscape within the Phase 3 SWL curtilage width.

After five (5) years from the date of the Phase 3 construction contract PC, and upon rectification of any known system defects (with the exception of normal wear and tear), Council would assume the operation and maintenance of the system from Walker, relieving Walker of any further liabilities.

Council will continue the established 'Walker standard' maintenance regime from this time forward.

5.4. Other Key Conditions

The detailed engineering design of the SWL system Phases will be such that if a subsequent Phase is delayed in delivery due to market or other conditions, the previous Phase can be operated and maintained independent of the subsequent Phase.

Residential sub-divisional stages and other infrastructure can be approved and constructed without reliance on the associated Phase of the SWL system providing adequate alternate stormwater and flood mitigations systems are in place.

To allow for the ongoing ownership and operation by Council of the Chapman Creek intake pump station and associated infrastructure including energy supply infrastructure, Walker will secure all necessary State Government approvals and easements over Crown Land in favour of Council prior to the end of the five (5) year period after PC of Phase 1.

Refer Section 9. External Infrastructure Arrangements for further details.

5.5. Council Transition Strategy

To encourage Council Operations 'ownership' and familiarity with the SWL system during its establishment and to develop a strong culture of 'partnership and engagement' in the lead-up to transition, Council are requested to provide human resources to work alongside the Riverlea operation and maintenance team to participate in the co-ordination and management of the operations and maintenance of the SWL system whilst under Walker 'cost and control'.

This approach recommended to establish a seamless and smooth transition of control from Walker to Council.

6. Financial Analysis Including Operation and Maintenance Costs

In order to provide Council with the most comprehensive and accurate information possible in the preparation of this document and in relation to the capital, operational and maintenance costs associated with the proposed SWL system, Walker has commissioned a range of highly qualified and accredited Consultants to carry out the cost analyses.

The Consultant Team consisted of the following professionals:

Consultant	Discipline
BDO EconSearch	Economic research and consulting services
BMT Commercial Australia Pty Ltd	Engineers
Burchills	Engineering Solution Consultants
Enerven	Energy Solutions Consultant and Provider
Hudson Howells	Strategic Management Consultants
PHAIS	Landscape Architects
Place Design Group	Landscape Architects
TSA	Procurement, Development, Planning and Program management Consultants
Wallbridge Gilbert Aztec	Consulting Engineers
Water Tech	Water, Coastal and Environmental Consultant
WM Developments	Consulting Engineers
WSP Global Inc	Engineering Services

Table 5 – Consultant Disciplines

6.1. Capital Expenditure for the SWL Proposal

The table below identifies each of the components of the proposed SWL system with estimated cost and service life.

Salt Water Lakes Capital Expenditure

Item	Cost (excluding gst)	Service Life of components (Years)
Site access	$ 500,000	50
Power supply (poles amd wires)	$ 500,000	50
Solar system	$ 1,895,000	
Inverters		10
Panels		25
Intake Pump Sation (IPS)	$ 250,000	50
Access platforms/handrailing	$ 20,000	25
Intake pipes	$ 240,000	25
Pumps	$ 200,000	25
Valves	$ 200,000	25
Supply Pipes (IPS to Lakes)	$ 9,536,170	100
Discharge Chambers	$ 40,000	25
Inlet / outlet structures (SWL 1)	$ 40,000	25
Inlet / outlet structures (SWL 2&3)	$ 20,000	50
Outfall pipework	$ 2,233,130	100
Lake Construction costs		
Clay liner	$ 11,297,520	100
Lake Edge treatments	$ 4,599,900	100
Sub-total	$ 31,571,720	
Contingency 10%	$ 3,157,172	
Totla Capital Expenditure	$ 34,728,892	

Table 6 – Summary SWL Capital Cost & Service Life

Walker will fund the capital expenditure of the SWL system and as noted above, will vest all the components to Council at various handover milestones as noted in Section 5 above, over the term of approximately 15 years.

It should be noted that the cost of bulk earthworks to create the various Phase lake basins is not included as it has been accounted for in the subdivisional civil works costs for provision of bulk fill to each stage.

*Refer **Appendix L** - Lake Circulation Capital Expenditure Costs*

6.2. General Operation and Maintenance Costs

The general operation and maintenance costs for the proposed SWL system incorporates both the lakes and associated channels and parkway links that comprise the stormwater and flood mitigation system.

The combination of water bodies, edge infrastructure and landscaped areas generate a range of operational and maintenance requirements to be considered, including the management of water quality.

RIVERLEA - SUMMARY OF ANNUAL MAINTENANCE COSTS

Items		Components	Qty	Unit	Rate	Maint. Cycles	Amount	Comment
1		**Channels and Parkland links**	306,300	m2				
		Average Width	60	m				
		Length of Channel / Parkland links	5,105	m				
		Controls @ 100m crs	100	m				
	1	Channels (between ponds/junctions)	51	No.	$ 200.00	14	$ 142,940	Allow 14 No. Maintenance Cycles - 4 Mths @ 2/mth, 4 Mths @ 1/mth and 4 Mths @ 0.5/mth.
	2	Ponds	51	No.	$ 200.00	14	$ 142,940	
	3	Junctions	10	No.	$ 100.00	14	$ 14,000	
	4	General maintenance	306,300	m2	$ 0.93	7	$ 1,994,013	Mowing/slashing, spraying, weeding, vermin, clean-up, fire hazard, rubbish.
							$ 2,293,893	
2		**Saltwater Lakes**	40.32	Ha				
	1	System Maintenance					*$ 471,072*	*Refer WM Dev / WSP Estimate (Mechanical Services).* **Refer Appendix K**
		Lake 1	146,428	m2	$ 1.17	NA	$ 171,092	
		Lake 2	141,606	m2	$ 1.17	NA	$ 165,457	
		Lake 3	115,131	m2	$ 1.17	NA	$ 134,523	Check Sum = $ 471,072
			403,165.00	m2				
	2	Water Body Maintenance						
		Lake 1	146,428	m2	$ 0.20	NA	$ 29,286	Flotsum, jetsom and floating weed removal
		Lake 2	141,606	m2	$ 0.20	NA	$ 28,321	Flotsum, jetsom and floating weed removal
		Lake 3	115,131	m2	$ 0.20	NA	$ 23,026	Flotsum, jetsom and floating weed removal
	3	Edge Maintenance						
		Lake 1	1,030	m	$ 2.72	8	$ 22,413	Maintenance of natural edge sections of lake
		Lake 2	1,975	m	$ 2.72	8	$ 42,976	
		Lake 3	1,665	m	$ 2.72	8	$ 36,230	
		Lake Natural Edge total length	4,670					
	4	General Maintenance Overview/Contingency		Item			$ 62,032	BMT - additional item including routine
				Avg.	$ 1.77	Sum	$ 715,356	inspections, aquatic vegetation and pest management, desilting and local
	5	Water Quality Monitoring (Sampling and Testing) - provided by Consulants BMT						
	1	Water quality monitoring	1	No.	$7,955.58	12	$ 95,467	
	2	Ecological surveys	1	No.	$23,210.00	2	$ 46,420	
	3	Sediment Accumulation Monitoring	1	No.	$11,400.00	0.33	$ 3,800	
						Sum	$ 145,687	
	6	Water Quality Pre-treatment Maintenance						
	1	Bio-Retention Water Quality Treatment	30	No.	$ 200.00	14	$ 84,000	Nominal 10 per lake or 30 in total - cyclical basis vegetation maintenance only.
							$ 945,043	
						Total	**$ 3,238,936**	**Annual Maintenance cost**

Table 7 – Summary of Total Annual Operation & Maintenance Costs

6.3. Circulation System Operation and Maintenance Costs

The proposed SWL system incorporates an active circulation system that operates on high daily duty to service the flow of sea water through the various SWL Phases. To undertake an appropriate comparison between the originally proposed stormwater system and the proposed SWL system it is critical to understand the operation and maintenance of the circulation system

Annual Operating and Maintenance Cost for Circulation System						
Excluding Solar Offset						
Circulation system - Phase 3 (Lakes SWL 1, 2 and 3 Operational)						
Item		Description	Qty	Unit	Rate	Amount
Energy Costs						
	Pumps	2 x 170kW Pumps	1,008,520	kW-h	$ 0.37	$ 373,152
					Sub-total	$ 373,152
Monitoring costs						
	Operator Attendance	Facility Inspections	416	Man-hrs	$ 120.00	$ 49,920
	Water Quality	Sampling and Testing	12	Mth	$ 1,500.00	$ 18,000
					Sub-total	$ 67,920
Maintenance Costs						
	Pumps	Maintenance and component replacement	2	Each	$ 60,000.00	$ 24,000
	Valves	Maintenance and component replacement		Item		$ 6,000
					Sub-total	$ 30,000.00
					Cost per Annum	**$ 471,072**

Table 8 – Summary of Annual Circulation System Operation & Maintenance Costs

*Refer **Appendix M** - Lake Circulation Annual Operational & Maintenance Costs*

6.4. Comparative Operation and Maintenance Costs

It is acknowledged that there will be cost differences for ongoing operation and maintenance costs between the original floodway network and the current SWL proposal.

The operation and maintenance costs were calculated for both the original floodway network and the current SWL proposal.

The original floodway network proposal included a small 3.5 Ha freshwater lake located in Precinct 1 in the eastern sector of the Riverlea project site. The floodways were on average approximately 60m wide and 3 to 4 meters deep with side slopes of 1: 4 rendering them virtually un-useable as activated open spaces and difficult to maintain.

The original freshwater lake was intended to be initially filled with freshwater from recycled water delivered via the Virginia Pipeline Scheme (VPS). Water required for making up losses through evaporation or seepage was also to be sourced from the VPS.

The freshwater lake was an integral part of the stormwater management system and was designed to receive stormwater runoff from surrounding residential areas. The nutrient loads in the stormwater and the recycled water would require high levels of maintenance to keep water quality and lake environs at an acceptable standard.

The design of the freshwater lake did not include a pumped circulation system.

Conversely, the proposed 40 Ha SWL system combined with a lesser network of floodways and more parkland links, provides for more useable and activated open spaces which provide for easier maintenance.

The SWL system is also designed to receive stormwater runoff from surrounding residential areas after pre-treatment prior to discharge into the various Phase lakes. The active saline circulation system ensures the water quality and lake environs remain at an acceptable standard with minimal maintenance required due to the salinity of the water being non-conducive to promotion of nutrient based activity such as algal and aquatic weed growth.

	Original Floodways Proposal		Proposed Salt Water Lake	
Items	Components	Amount	Components	Amount
1	Floodway Areas	$ 6,071,987	Floodway and Parkland links	$ 2,293,893
2	Maintenance 3.5 Ha Freshwater Lake	$ 194,904	Maintenance 40.3 Ha Salt Water Lake	$ 507,356
3	Lake Management	$ 98,142	Lakes Management	$ 229,687
		$ 6,365,032		$ 3,030,936
			Cost Saving	$ 3,334,096

Table 9 – Summary of Annual Circulation System Operation & Maintenance Costs

Note that the above figures include the cost saving from the solar alternative energy solution for the SWL system proposal.

*Refer **Appendix N** – General Maintenance Comparison Costs*

…. more parkland links provides for more useable and activated open spaces ….

7. Social and Economic Impacts

In July 2022, Hudson Howells, in association with BDO EconSearch, was engaged by Walker to undertake a study to determine the impact the delivery of the SWL system for the Riverlea development project would have on the City of Playford.

The proposed SWL system is a central component for the project, which will play a key role in stormwater management, visual amenity and recreational amenity.

The study examined the impact of the SWL system from two key perspectives:

1. The financial impact of the implemented SWL system on the City of Playford as the ultimate owner and operator of the system.
2. The social impact, in the form of a statistically robust survey, on the local and surrounding communities from where the potential future residents of, and visitors to, Riverlea will be drawn.

When the research findings are overlayed on the financial analysis undertaken by BDO EconSearch, it is clear that the Lake System option is highly beneficial to Council and its constituents.

7.1. Hudson Howells

In order to better understand the level of community support for such a proposal, Walker commissioned Hudson Howells Strategic Management Consultants to undertake a study of a broad cross section of the community as potential future residents of, and visitors to, Riverlea.

The intention of the study was to ascertain the community's response to two options for the public realm design outcome within Riverlea, one of which included a previously mooted proposal for a small freshwater lake and a network of floodways for stormwater management and flood mitigation across the Riverlea project site, and the other for a large salt water lake incorporating a system of parkland links incorporating shallow overland flow pathways and minimal floodways for stormwater management and flood mitigation within the project.

Research methodologies such as focus groups and in-depth interviews were discussed as options for the method of conducting the study, but it was concluded that the evidence base for decision making should be the result of an empirical study using a quantitative approach.

An online survey was designed and 692 responses were received with 342 responses being drawn from the Riverlea database and 350 responses drawn from surrounding communities.

The result of the study was overwhelming community support (93%) for the proposed SWL system.

*Refer **Appendix O** - Hudson Howells Report*

7.2. BDO EconSearch

In addition to commissioning a team of Consultants to establish the capital expenditure and operation & maintenance costs, Walker commissioned BDO EconSearch to calculate Council's nett financial position when comparing the original floodway network to the current SWL proposal.

BDO EconSearch provide economic research and consulting services in the agricultural and resource industries throughout Australia. The firm provides independent economic analysis and policy advice to government agencies, industry associations, research and development corporations, regional development boards, and other organisations.

The analysis conducted by BDO for this project conforms to South Australian and Commonwealth Government guidelines for conducting evaluations of public sector projects (Department of Treasury and Finance (2014) and Department of Finance and Administration (2006).

The costs and benefits were measured using a 'with' and 'without' project framework, that is, quantification of the incremental changes associated with the original floodway network proposal (Base Case) compared with the proposed 40 Ha SWL system (Lakes Option) from the point of view of Council.

A description of the options is as follows:

Base Case: A 3.5 Ha freshwater lake and extensive network of floodways for stormwater / flood mitigation as originally proposed

Lakes Option: A 40 Ha SWL system with parkland links incorporating shallow overland flow pathways and minimal floodways for social benefit, stormwater / flood mitigation which, relative to the base case, will result in higher amenity, wellness and wellbeing for residents.

Consultants WSP and BMT Global have identified the asset values, operational and maintenance costs which BDO have utilized as inputs into the analysis.

The evaluation criterion employed for this analysis was Net Present Value (NPV), which is the discounted option benefits less discounted option costs, measured in Dollars and relative to the Base Case. Under this decision rule the option is considered to be viable if the NPV is greater than zero.

Table 10 (BDO's table ES-1) below shows the results of the financial analysis in present value term. In each year of the 25 year period costs to maintain the open channels (Base Case) is expected to exceed the costs to operate and maintain the salt water lake system (Lakes Option).

This means that from a pure cost perspective, the Lakes Option is preferred to the Base Case and that the costs for Council to maintain the Base Case are greater than the costs to maintain the Lakes Option in every year of the analysis.

In addition, BDO found that the increased sales demand from improved visual and recreational amenity under the Lakes Option is expected to bring forward the increase in general rate revenue compared to that which would be received under the open channel Base Case.

The net present value (NPV) of $38.4m indicates that, relative to the Base Case, the Lakes Option is expected to generate a net benefit to Council of $38.4m over a 25 year period.

The decision rule is that the investment is preferred to the Base Case if the NPV is greater than zero.

Table ES-1 Present value of result of the financial analysis ($m)

	Expected Council Benefit		
	No lakes	With lakes	Net benefit of lakes
Rate income	147.46	198.96	51.50
Residual capital value	0.00	2.35	2.35
Provision of Council Services	-147.46	-178.69	-31.23
Capital replacement costs	0.00	-0.06	-0.06
Maintenance costs	-32.60	-16.77	15.84
Total	**-32.60**	**5.80**	**38.40**

Source: BDO EconSearch analysis

Table 10 – Present Value Analysis

A NPV of $38.4m over the 25 year period of analysis represents an annual net benefit for Council of $1.5m. This annual benefit would increase the expected operating surplus for 2022/23 ($1.9m (City of Playford 2022b)). This benefit is presented in this report as a financial benefit to the Council, but could be passed on to rate payers in the form of a lower rate in the dollar of capital value.

A sensitivity analysis found that the NPV for the Lakes Option remains positive over a reasonable range of assumed values for key variables in the analysis.

In summary, the Lakes Option is preferred to the Base Case as a stormwater and flood mitigation solution. Not only will the Lakes Option cost less than the Base Case option to operate and maintain, it is expected to bring forward the increase in general rate revenue compared to that which would be received under the Base Case.

This is a significantly positive benefit to council and will serve to underpin the 10,000 employment impact expected from the Riverlea project.

*Refer **Appendix P** - BDO EconSearch Report*

8. Alternative Energy Sources

The proposed Chapman Creek intake pump station will incorporate two 170 kW pumps to pump salt water through twin 710 mm diameter high density polyethylene (HDPE) pipes to the SWL Phases.

The pumps are required to operate under normal conditions for 350 days per year for 10 hours per day.

The pumps will also operate for the remaining 15 days per year for 20 hours per day, which is required to 'flush' the SWL Phases from time to time after heavy stormwater inflows.

Enerven and Planet Ark were consulted regarding alternative power solutions for the intake pump system. Enerven provided a range of options for consideration, which included options for different pump sizes as well as 'in front of the meter' and 'behind the meter' solutions.

Enerven's Option 3 proposes a bulk supply, high voltage connection to the SAPN distribution network at a dedicated solar farm. Behind this connection, they propose a high voltage (HV) network consisting of a HV cable, step-up transformers and ring main unit, to which both the solar farm and intake pump station are connected.

This achieves a 'behind the meter' connection and allows the solar farm to be located remotely from the intake pump station. By locating the solar farm remotely from the intake pump station and its saline environment, the service life of the solar panels and associated infrastructure will be maximised.

The pumps will be powered by solar energy as the primary energy source, but will still have a grid connection as the backup power source in the event of a shutdown of the solar system.

The solar farm will be established within Riverlea and in near proximity to existing SAPN poles and wires, possibly adjacent Carmelo Road at a location yet to be confirmed. The solar farm and associated infrastructure will be delivered by Walker Corporation as part of the external infrastructure works package.

Enerven also presented a range of other options for consideration, including Power Purchase Agreements, Embedded Networks and utilizing existing Council assets to accommodate solar infrastructure to offset the power load required by the pumps. These alternate methodologies can be explored further in conjunction with Council as development of Riverlea progresses.

Annual Operating and Maintenance cost for Circulation System						
Including Solar Offset						
Circulation system - Phase 3 (Lakes SWL 1, 2 and 3 Operational)						
Item		Description	Qty	Unit	Rate	Amount
Energy Costs						
	Pumps	2 x 170kW Pumps	1,008,520	kW-h	$ 0.37	$ 373,152
		Solar Offset per Enerven report at **Appendix Q**				-$ 208,000
					Sub-total	$ 165,152
Monitoring costs						
	Operator Attendance	Facility Inspections	416	Man-hrs	$ 120.00	$ 49,920
	Water Quality	Sampling and Testing	12	Mth	$ 1,500.00	$ 18,000
					Sub-total	$ 67,920
Maintenance Costs						
	Pumps	Maintenance and component replacement	2	Each	$ 60,000.00	$ 24,000
	Valves	Maintenance and component replacement		Item		$ 6,000
					Sub-total	$ 30,000.00
					Cost per Annum	**$ 263,072**

Table 11 – Summary of Annual Circulation System Operation & Maintenance Costs – Including Solar Offset

*Refer **Appendix Q** – Enerven Report*

Planet Ark provided more complex models for consideration based on solar power, which deals with Frequency Control Ancillary Services (FCAS) markets, arbitrage trading and grid stabilization.

Whilst these models appear to have merit, they will need to be explored in more detail with Council as development of Riverlea progresses.

9. External Infrastructure Arrangements

To date, Walker has extensively engaged with State Government agencies regarding the 'essential infrastructure' beyond the Riverlea project area, which is required for the SWL system.

As previously noted, this infrastructure consists of an intake pump station, pipe network and power supply that will lie within an unmade portion of Legoe Road until it reaches Crown Land and then diverts to the Chapman Creek intake location adjacent Gulf St Vincent.

The Crown Lands Program within the Department for Environment and Water *(DEW)* is the key agency that assisted Walker in identifying the required Crown Land processes and the relevant stakeholder interests.

Presently, the land is dedicated for fish culture purposes under the care, control and management of the Minister for Primary Industries and Regional Development *(PIRSA)*. The land is also subject to a Mining Lease in favour of Buckland Dry Creek Pty Ltd *(BDC)*, which is managed by Department for Energy and Mining *(DEM)*.

Walker will apply for a license under Section 46 of the *Crown Land Management Act 2009* to allow construction to occur. DEW anticipates Walker Corporation will apply for the appropriate construction license once other necessary approvals are obtained;

Walker has engaged with DEM, PIRSA, DEW and BDC as interested parties to date, and will work in good faith to engage with these parties to seek their consent before the license is requested. Generally, DEW can issue a Crown license within four weeks of receiving an application.

Walker has secured approval from the Native Vegetation Council (under the *Native Vegetation Regulations 2017*) to undertake necessary vegetation clearance required to locate the intake pump station and associated pipework and power supply components.

Walker has also applied for the necessary planning approvals for the essential intake and pipework infrastructure (following Section 131(2)(c) of the *Planning, Development and Infrastructure Act, 2016*). This application is presently on hold, pending consideration of the development application for the Precinct 2 variation (incorporating the SWL system) lodged with PLUS.

Walker is aware that authorisations may be required from Green Adelaide / the Minister for Environment and Water under Section 105 of the *Landscape South Australia Act 2019* to undertake de-watering activities associated with infrastructure construction and seawater extraction.

Ultimately, Walker will secure longer-term tenure by easement (in favour of Council) following Section 28 of the *Crown Land Management Act 2009* after construction commences.

10. Matters Transferred from the Phase 2 Report

A number of matters were carried forward from the Phase 2 report which were to be addressed in this Phase 3 report.

The intention of this SWL Phase 3 report however, is to deal with matters carried forward that are of primary interest to Council Executive in assessing the approval of the proposal for the Salt Water Lakes (SWL) system, with the view to:

- Council approving the proposal for the Salt Water Lakes (SWL) system to be incorporated into the Riverlea Master Plan
- Support Walker to move to the development of detailed engineering design and approval of the SWL system for the staged construction of the system
- Support Walker in the preparation of formal arrangements between Walker and Council for the long-term delivery, transfer, ownership and maintenance of the SWL system.

Table 12 below categorizes all matters agreed to be carried forward from the Phase 2 report that was endorsed by Council, and shows each category as a percentage of the total carried forward comments.

Description	% of comments
Stormwater Management*	32%
Operation and Maintenance	25%
Water Quality	15%
Environmental	5%
Clay Liner	5%
Engineering Detail	4%
Recycled water	4%
Land Tenure / Ownership	4%
Salinity	3%
Social	1%
Groundwater	1%
	100%

* Stormwater Management Plan has now been completed and will be submitted to Council engineering staff under separate cover for review.

Table 12 – Phase 2 comments carried forward

Carried forward matters not addressed in this report will be dealt with in the detailed design phase which will follow approval of this report.

11. Appendix A – Council Endorsement of Phase 2 Report

CITY OF Playford

22 August 2022

Mr Mike Lyons
Project Director, Residential
Walker Corporation
Riverlea Sales and Discovery Centre
9 Bonnin Crescent,
Riverlea Park SA 5120

BY EMAIL: Mike.Lyons@walkercorp.com.au

Dear Sir,

Riverlea SWL Phase 2.0 - Response to Council Comments/Further Response Close Out

I am writing further to your submission to Playford Council of the formal response and comments register on 10 June 2022 regarding the ongoing resolution of various issues relating to the general design, operation and maintenance of the Riverlea Saltwater Lakes (SWL) system.

Playford Council provided a detailed response to Walker Corporation on the original SWL 2.0 submission on 4 May 2022 noting that Council endorsed the Saltwater Lakes proceeding in 3 phases and that;

> *Council is comfortable to proceed to SWL Phase 3 on the basis that Walkers and their consultants address those matters raised in Council's responses to SWL 1.0 and SWL 2.0, and also that Walkers undertake the further work as indicated in the Walkers responses to SWL 1.0 (spreadsheet attached) and those matters identified in Walkers Phase 2 submission.*

The attached spreadsheet, with a close out date of 19.08.2022, identifies that all SWL 2.0 review items have either been *"Closed"* or *"Transferred to SWL 3.0"* (for final review & assessment).

City of Playford
Call — 08 8256 0333
playford@playford.sa.gov.au
playford.sa.gov.au

Post
12 Bishopstone Road
Davoren Park SA 5113

Visit
Playford Civic Centre
10 Playford Boulevard
Elizabeth SA 5112

Stretton Centre
307 Peachey Road
Munno Para SA 5115

1

Accordingly, Playford Council endorses Walker Corporation proceeding to Phase 3 of the Riverlea Saltwater Lakes submission.

Council looks forward to continuing discussions with Walker Corporation regarding the Riverlea Estate in order to achieve a fantastic community outcome.

Yours faithfully,

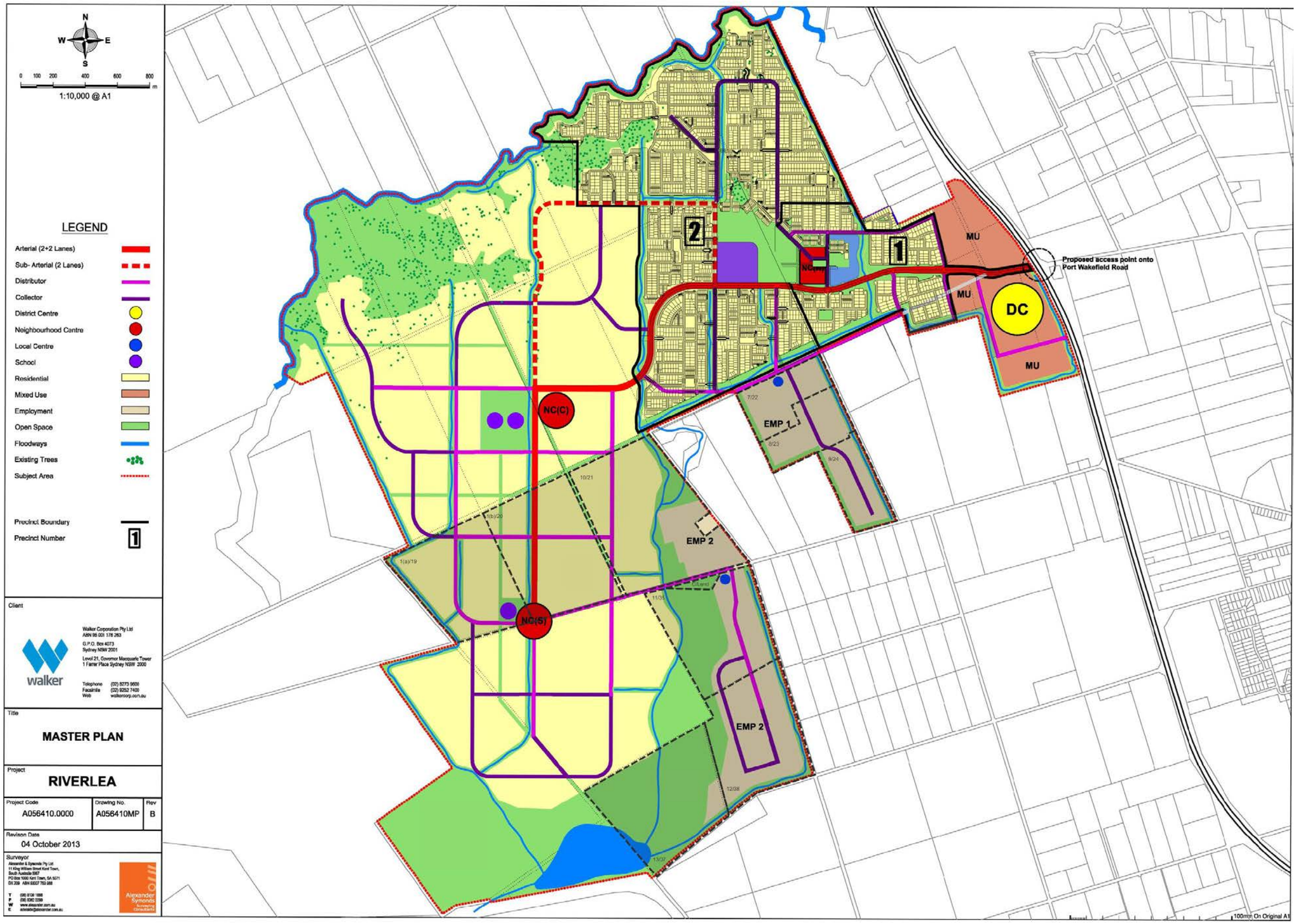
Andrew Smith

Growth and Infrastructure Coordinator

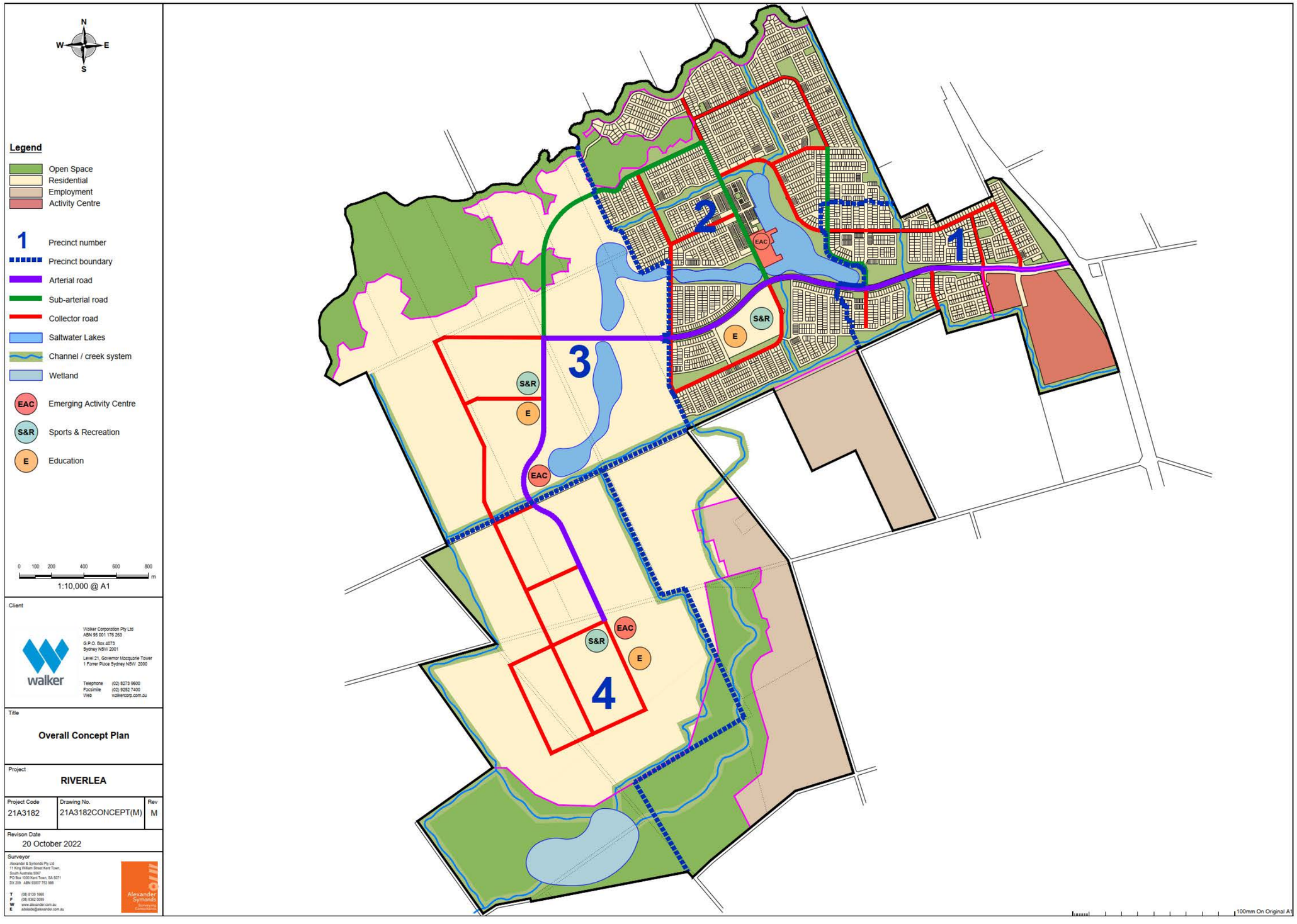
CITY OF PLAYFORD COUNCIL

(08) 8256 0336
Email: adsmith@playford.sa.gov.au

12. Appendix B – Original Master Plan



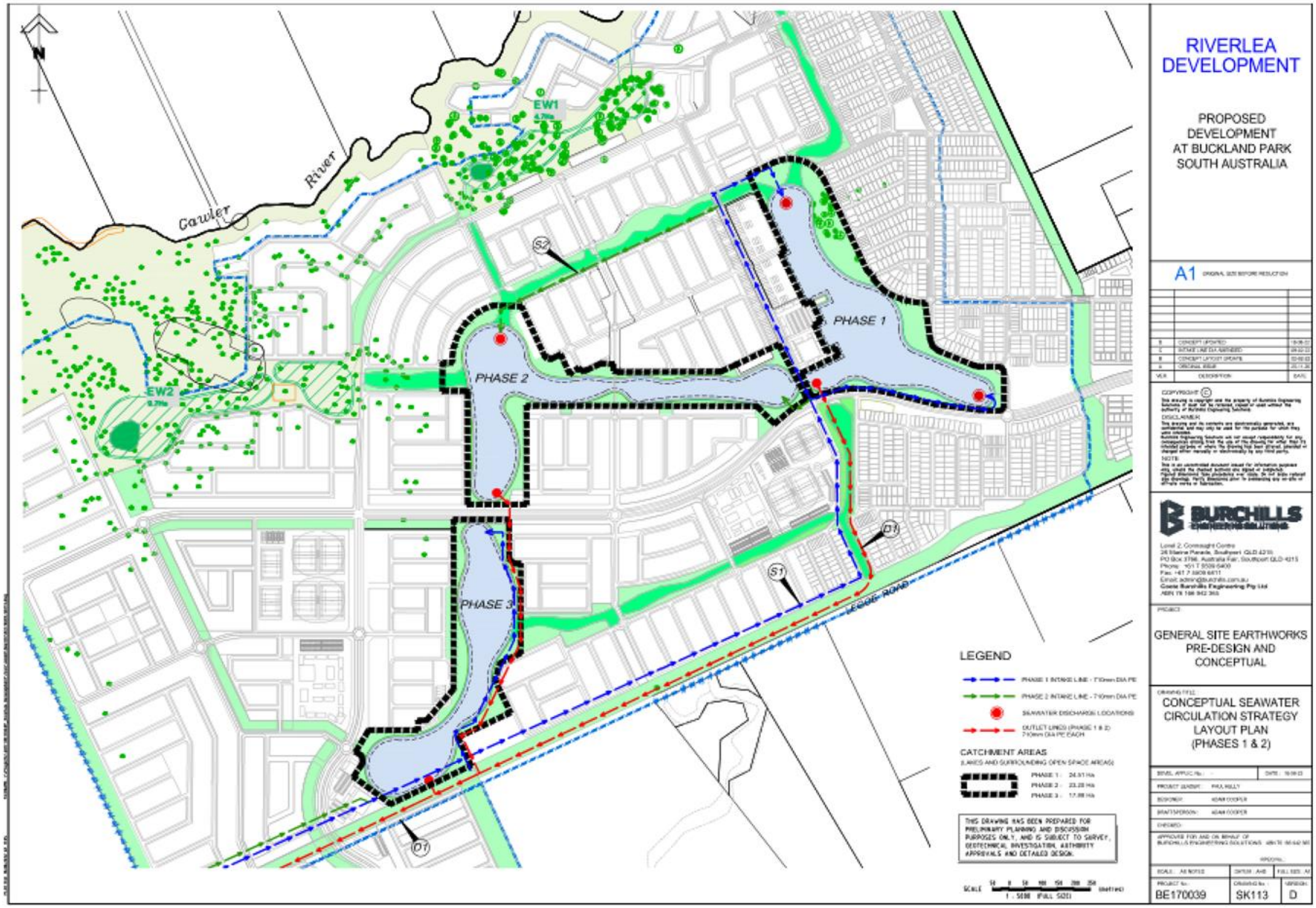
13. Appendix C – Riverlea Current Master Plan



14. Appendix D – Riverlea Marketing Master Plan

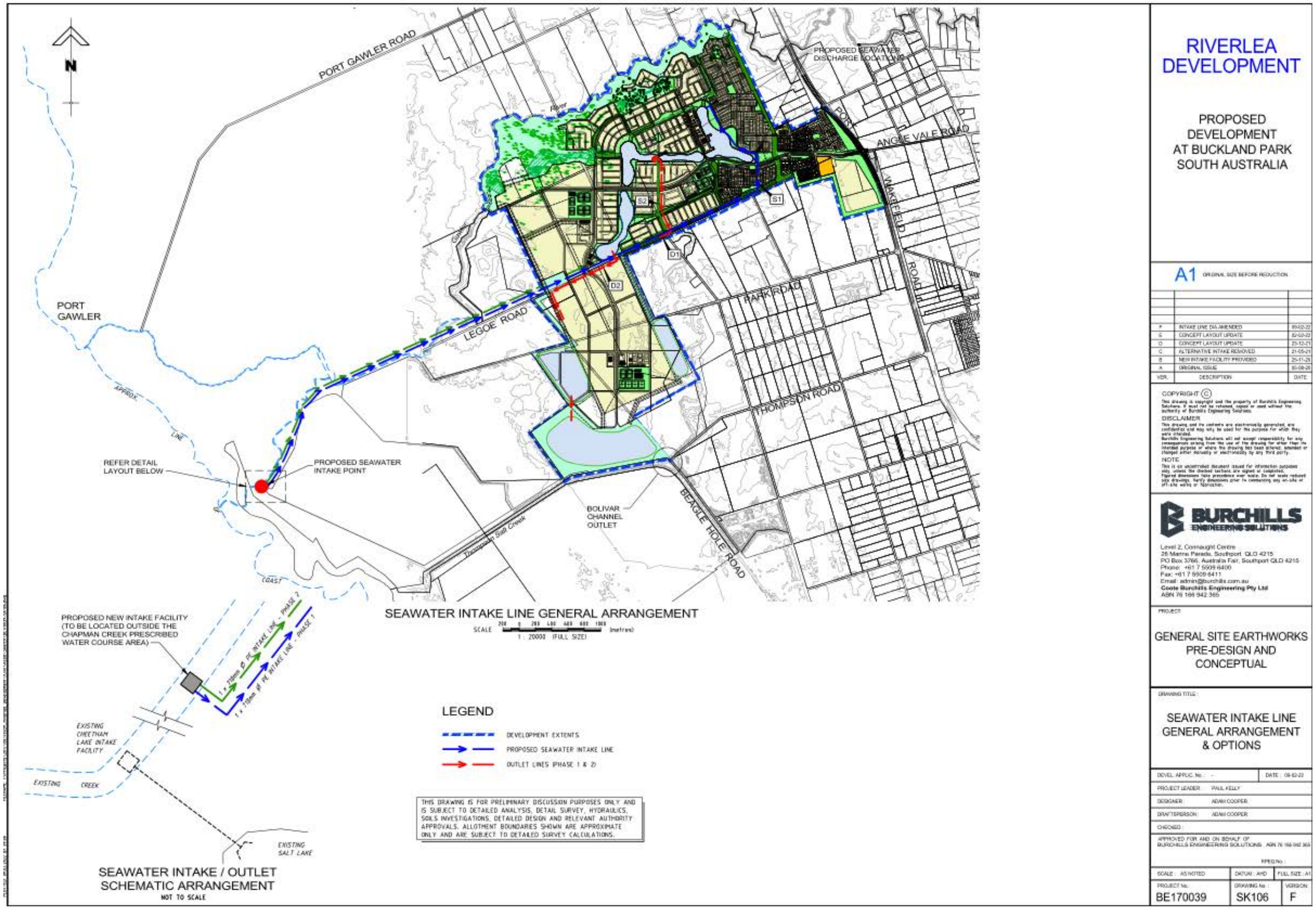
15. Appendix E – Salt Water Lakes Designation Plan

16. Appendix F – Salt Water Lakes Phases Plan



17. Appendix G – SWL Circulation System Outlet Plan

18. Appendix H – SWL Circulation System External Infrastructure Plan




N
UNDERGROUND WITHIN LEGOE ROAD RESERVE 1,680m LENGTH
LEGOE ROAD
UNDERGROUND WITHIN LEGOE ROAD RESERVE 860m LENGTH
UNDERGROUND WITHIN LEGOE ROAD RESERVE 590m LENGTH MINIMAL DISTURBANCE DIRECTIONAL DRILLING OPTION FOR THIS SECTION
UNDERGROUND (WITHIN LEVEE) 980m LENGTH
EXISTING CREEK
INTAKE LOCATION
EXISTING CHEETHAM LAKE INTAKE FACILITY
70m LENGTH
EXISTING SALT LAKE
SEAWATER INTAKE ROUTE STRATEGY
SCHEMATIC ARRANGEMENT
SCALE 50 0 50 100 150 200 250 Metres
1 : 5000 (FULL SIZE)
THIS DRAWING IS FOR PRELIMINARY DISCUSSION PURPOSES ONLY AND IS SUBJECT TO DETAILED ANALYSIS, DETAIL SURVEY, HYDRAULICS, SOILS INVESTIGATIONS, DETAILED DESIGN AND RELEVANT AUTHORITY APPROVALS. ALLOTMENT BOUNDARIES SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO DETAILED SURVEY CALCULATIONS.
RIVERLEA DEVELOPMENT
PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA
A1 ORIGINAL SIZE BEFORE REDUCTION
C ORIGINAL AMENDMENTS 17-02-22
B ORIGINAL AMENDMENTS 14-02-22
A ORIGINAL ISSUE 11-02-22
VER DESCRIPTION DATE
COPYRIGHT ©
DISCLAIMER
NOTE
BURCHILLS ENGINEERING SOLUTIONS
Level 2, Connaught Centre
26 Marine Parade, Southport QLD 4215
PO Box 3766, Australia Fair, Southport QLD 4215
Phone: +61 7 5509 6400
Fax: +61 7 5509 6411
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365
PROJECT:
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL
DRAWING TITLE:
SEAWATER INTAKE LINE ROUTE STRATEGY LEGOE ROAD (FROM INTAKE TO SITE BDY)
DEVEL APPLIC No. : DATE: 17-02-22
PROJECT LEADER: PAUL HELLY
DESIGNER: ADAM COOPER
DRAFTSPERSON: ADAM COOPER
CHECKED:
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365
RPEQ No.
SCALE: AS NOTED
DATUM: AHD
FULL SIZE: A1
PROJECT No.: BE170039
DRAWING No.: SK118
VERSION: C

SEAWATER INTAKE / OUTLET
SCHEMATIC ARRANGEMENT

SCALE 5 0 5 10 15 20 25 (metres)
1 : 500 (FULL SIZE)

THIS DRAWING IS FOR PRELIMINARY DISCUSSION PURPOSES ONLY AND IS SUBJECT TO DETAILED ANALYSIS, DETAIL SURVEY, HYDRAULICS, SOILS INVESTIGATIONS, DETAILED DESIGN AND RELEVANT AUTHORITY APPROVALS. ALLOTMENT BOUNDARIES SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO DETAILED SURVEY CALCULATIONS.

RIVERLEA DEVELOPMENT

PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
D	INTAKE LINE DIA AMENDED	09-02-22
C	INTAKE LINE DIA AMENDED	02-02-22
B	MINOR AMENDMENTS, CO-ORDINATES ADDED	27-01-22
A	ORIGINAL ISSUE	27-01-22

BURCHILLS ENGINEERING SOLUTIONS
Level 2, Connaught Centre
26 Marine Parade, Southport QLD 4215
PO Box 3766, Australia Fair, Southport QLD 4215
Phone: +61 7 5509 6400
Fax: +61 7 5509 6411
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 168 942 366

PROJECT:
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL

DRAWING TITLE:
SEAWATER INTAKE LINE GENERAL ARRANGEMENT

DEVEL. APPLIC. No. : -	DATE : 09-02-22
PROJECT LEADER :	PAUL KELLY
DESIGNER :	ADAM COOPER
DRAFTSPERSON :	ADAM COOPER
CHECKED :	

APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 168 942 366

RPEQ No. :

SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1
PROJECT No. : BE170039	DRAWING No. : SK117	VERSION : D

19. Appendix I – Program of Works

RIVERLEA, Port Wakefield, South Australia

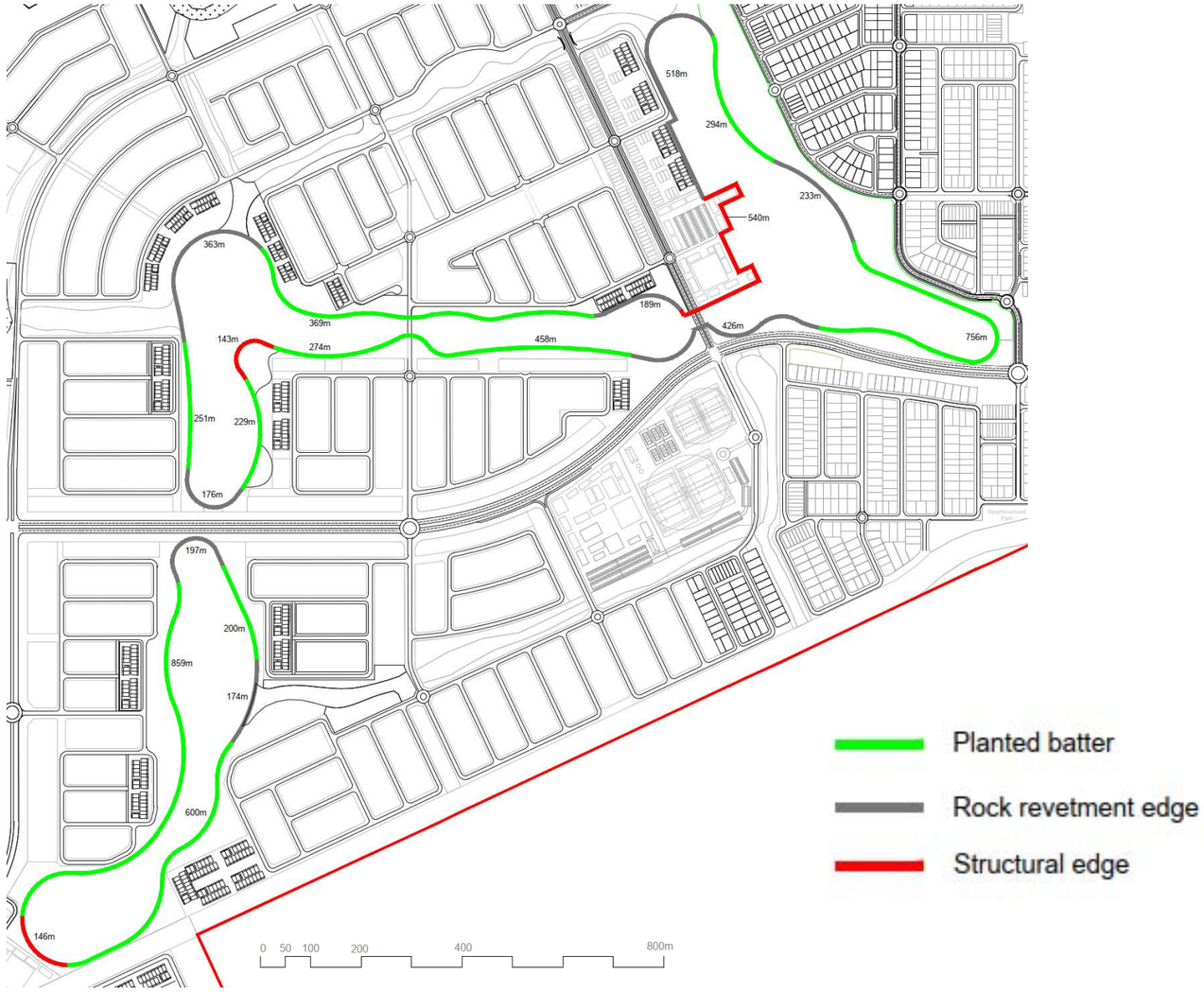
CONSTRUCTION OF LANDFORM EARTHWORKS - Scheduling of Works (Revised Layout 16/11/22)

Phase	Description of Works	Construction Details (Installation)					Eff. Fac	Seq/Concurrent
		Earthworks		Installation Rate			0.85	
		Qty	Unit	Rate	Unit	Time	Time	
	Lake SWL 1 9 Months							
L1	CONSTRUCTION OF SWL 1/2/3							
	LAKE CONSTRUCTION							
	Lake Perimeter Bund							
	WQ Drains and Basins	600	m	100	Lm/d	6	7	C
Bay A	Upper Level earthworks	60,000	m3	4,000	m3/d	15	18	C
	Dewatering	600	m	100	Lm/d	6	7	S
	Lower Level earthworks	60,000	m3	4,000	m3/d	15	18	S
	Clay liner - Layer 1	12,000	m3	2,000	m3/d	6	7	S
	Clay liner - Layer 2	12,000	m3	2,000	m3/d	6	7	S
	Temporary Containment Bund	200	m	50	Lm/d	4	5	S
	Lake Edge Revetment	600	m	30	Lm/d	20	24	C
							92	
	Lake Perimeter Bund							
	WQ Drains and Basins	600	m	100	Lm/d	6	7	C
Bay B	Upper Level earthworks	60,000	m3	4,000	m3/d	15	18	C
	Dewatering	600	m	100	Lm/d	6	7	S
	Lower Level earthworks	60,000	m3	4,000	m3/d	15	18	S
	Clay liner - Layer 1	12,000	m3	2,000	m3/d	6	7	S
	Clay liner - Layer 2	12,000	m3	2,000	m3/d	6	7	S
	Temporary Containment Bund	200	m	50	m3/d	4	5	S
	Lake Edge Revetment	600	m	30	Lm/d	20	24	C
							92	
	Lake Perimeter Bund							
	WQ Drains and Basins	600	m	100	Lm/d	6	7	C
Bay C	Upper Level earthworks	60,000	m3	4,000	m3/d	15	18	C
	Dewatering	600	m	100	Lm/d	6	7	S
	Lower Level earthworks	60,000	m3	4,000	m3/d	15	18	S
	Clay liner - Layer 1	12,000	m3	2,000	m3/d	6	7	S
	Clay liner - Layer 2	12,000	m3	2,000	m3/d	6	7	S
	Temporary Containment Bund	200	m	50	m3/d	4	5	S
	Lake Edge Revetment	600	m	30	Lm/d	20	24	C
							92	
							275	
						Mths	9.2	
C1	CIRCULATION SYSTEM CONSRUCTION							
	Intake Facility					60	71	S
	Pumps and Associated Works					60	71	C
	Supply Lines	8,000	m	100	Lm/d	80	94	C
	Outfall Line	2,000	m	100	Lm/d	20	24	S
	Discharge Chamber					30	35	C
	Commissioning					30	35	
						Mths	6.0	

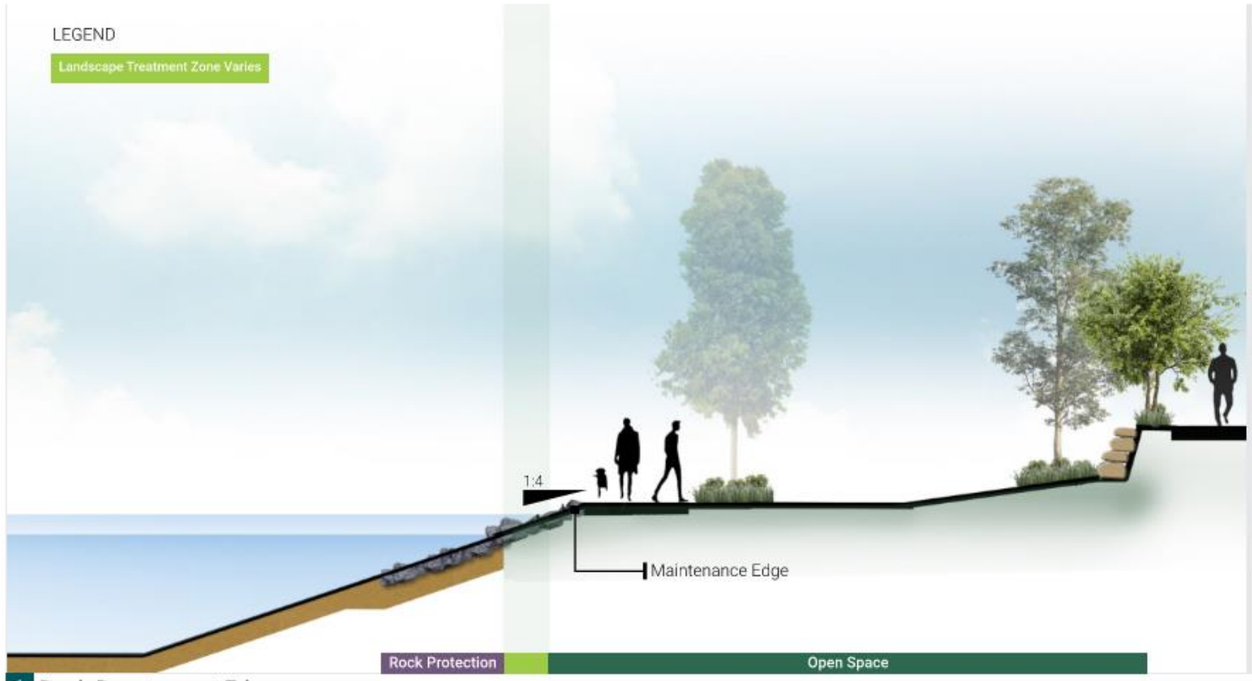
20. Appendix J – SWL Phase Circulation System Sequencing

21. Appendix K – Proposed Lake Edge Treatments and Clay Liner

Lake Edge



Type	Length	Rate / lin m	Total Cost	%
Rock protection zone*	7774	$ 290	$ 2,254,460	100%
Rock Revetment Edge	2276	$ 200	$ 455,200	29%
Planted Edge	4670	$ 192	$ 896,640	60%
Structural Edge	828	$ 1,200	$ 993,600	11%
Totals	7774		$ 4,599,900	
* Applies to whole perimeter of lakes				
Rates provided by Place Design Group				



1 Rock Revetmenet Edge

Blue stone rock bedded within concrete to 200mm deep - 4m wide

Total= $200 per L/m

2 Natural Edge

Planting preparation, 8 x 75mm tube stock, 300mm ameliorated site soil, 75mm mulch = $32 per m2
Tidal section is 4m wide

Total= $128 per L/m

place design group.
Place Design Group Pty Ltd
Level 4, 7 Short Street
Southport, QLD
4215 Australia
T + 61 7 5591 1229

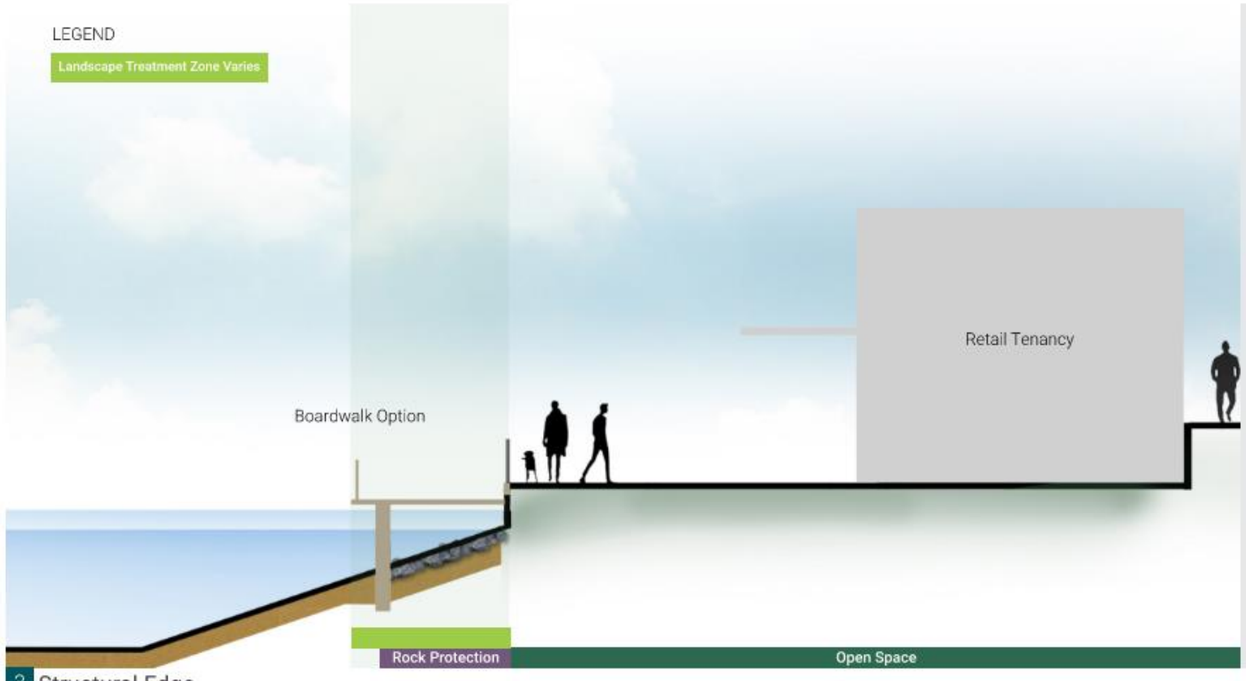
Riverlea Saline Lake - Lake Edge Options

Lake Edge Type 1 & 2

walker Riverlea

Date	02 December 2022
Project No.	1521034
Revision	A

01



3 Structural Edge

Board walk - excluded
Revetment wall @ $1200Lm

Total= $1200 L/m

4 Sandstone Revetment Edge

Dry stack stone wall (imported) @ $180 L/m

Total= $180 per L/m

5 Planted edge 'salt tolerant'

Planting preparation, 8 x 75mm tube stock, 300mm ameliorated site soil, 75mm mulch = $32 per m2
Tidal section is 6m wide

Total= $192 per L/m

6 Lake Rock Edge Protection to Engineer's Detail

300mm thick rock protection + Geofabric. Nominal 5-7m wide

Total= $290 per L/m

place design group.
Place Design Group Pty Ltd
Level 4, 7 Short Street
Southport, QLD
4215 Australia
T + 61 7 5591 1229

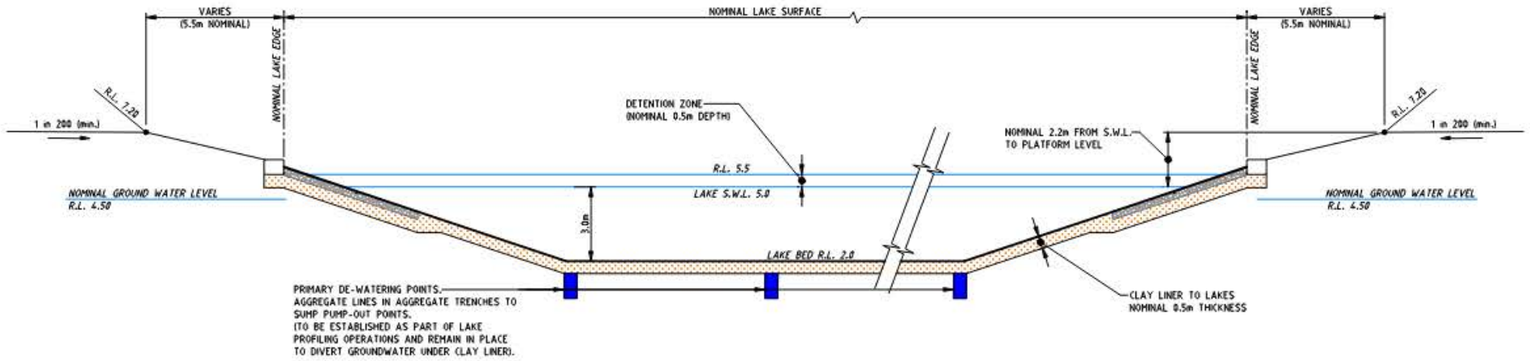
Riverlea Saline Lake - Lake Edge Options

Lake Edge Type 5 & 6

walker Riverlea

Date	02 December 2022
Project No.	1521034
Revision	A

Clay Liner



TYPICAL LAKE-EDGE CROSS SECTION A - A
(FOR LAKE S.W.L. 5.0)

SCALE 1 0 1 2 3 4 5 (metres)
1 : 100 (FULL SIZE)

PRELIM DRAFT

RIVERLEA DEVELOPMENT

PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA

A1 ORIGINAL SIZE BEFORE REDUCTION

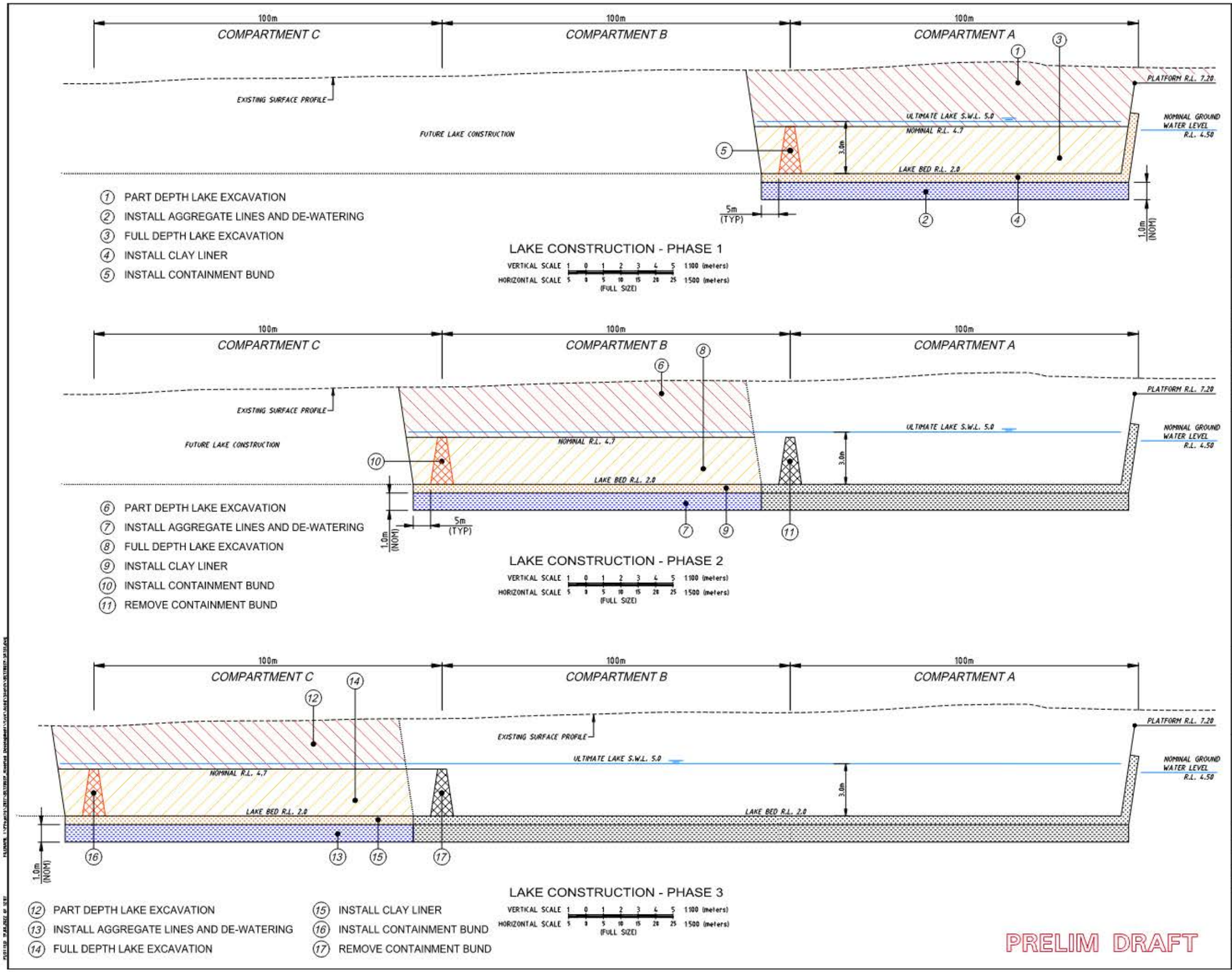
VER.	DESCRIPTION	DATE
B	AGG. LINES REVISED	20-05-21
A	ORIGINAL ISSUE	19-05-21

BURCHILLS ENGINEERING SOLUTIONS
Level 2, Connaught Centre
26 Marine Parade, Southport QLD 4215
PO Box 3766, Australia Fair, Southport QLD 4215
Phone: +61 7 5509 6400
Fax: +61 7 5509 6411
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL

DRAWING TITLE:
TYPICAL LAKE CONSTRUCTION EARTHWORKS SEQUENCE SHEET 3

DEVEL. APPLIC. No.: -	DATE: 20-05-21
PROJECT LEADER: PAUL KELLY	
DESIGNER: ADAM COOPER	
DRAFTSPERSON: ADAM COOPER	
CHECKED:	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No.:	
SCALE: AS NOTED	DATUM: AHD / FULL SIZE: A1
PROJECT No.: BE170039	DRAWING No.: SK132 / VERSION: B



RIVERLEA DEVELOPMENT

PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
C	MINOR AMENDMENTS	19-08-22
B	AGD. LINES REVISED ON SECTIONS	20-05-21
A	ORIGINAL ISSUE	19-05-21

BURCHILLS ENGINEERING SOLUTIONS
Level 2, Connaught Centre
26 Marine Parade, Southport QLD 4215
PO Box 3766, Australia Fair, Southport QLD 4215
Phone: +61 7 5509 6400
Fax: +61 7 5509 6411
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL

DRAWING TITLE:
TYPICAL LAKE CONSTRUCTION EARTHWORKS SEQUENCE SHEET 2

DEVEL. APPLIC. No.: -	DATE: 19-08-22
PROJECT LEADER:	PAUL KELLY
DESIGNER:	ADAM COOPER
DRAFTSPERSON:	ADAM COOPER
CHECKED:	

APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

RPEQ No.:

SCALE: AS NOTED	DATUM: AHD	FULL SIZE: A1
PROJECT No.: BE170039	DRAWING No.: SK131	VERSION: C

22. Appendix L – Lake Circulation Capital Expenditure Costs

wm developments pty ltd

ACN 073 297 659
ABN 23 073 297 659

M Willoughby CPEng, RPEQ
19 Yamanie Crt,
Nerang, Qld 4213
Mob: 0417 073 632

31th October 2022

WALKER BUCKLAND PARK DEVELOPMENTS P/L
C/- Suite 3 Level 1, 128 Bundall Rd,

Attention: Mike Lyons

Re: Riverlea Residential Development – Saltwater Lakes Proposal

Lake Circulation System – Preliminary Capital Expenditure Cost Estimate

A Saltwater Lakes System has been proposed to replace the open drain system included in the Original Development Layout.

With a desire to provide the best liveable development outcome possible, and the nearby source of bulk saltwater, a re-engineering opportunity has been undertaken that delivers a Saltwater Lakes System (SWL) with stormwater drainage integration (lakes detention) combined with significant areas of adjacent parkland.

Preliminary Lake Circulation System Capital Expenditure Costs, subject to turnover refinement (including reticulation pipe and pump sizing) for the completed three (3) Lake System (SWL's 1, 2 and 3) are estimated at: -

- Costs based on GRP (Flowtite Pipe SC) $ 15,157,230
  (incl. 10% contingency)

Refer to the details provided in the attachments.

Further comment on relevant components of the costings is provided below: -

C1 - design status of water the distribution network is estimated given at 50%.

C2 - geotechnical information, whilst not specific to the pipeline alignment, appears to be is reasonably uniform (within the site) as detailed in the Golder Associates Reporting dated 31 March 2009. (Refer extracts attached).

Mobile: 0417 073632 Email: mikewmd@bigpond.com

Geotechnical information for the pipeline alignment between the western boundary of the site and the proposed water intake point is still required, however, there is history of vehicle access to the area associated with the earlier Cheetham Salt Operation, including access to their separate intake facility.

The water table to the west of the Gawler River crossing is expected to be high, however, appropriate construction methodologies can facilitate the works.

C3 - material excavated from the trenching operation or suitable locally available (Within the confines of the site) is expected to be suitable for pipeline bedding and backfill. Refer Item C2
Refer re extracts attached.

C4 - Leed Engineering have provided their Construction Method Statement for Installation GRP Pipes (SA Water – Northern Adelaide Irrigation Scheme). The Riverlea Pipe Install will be similar. Indicative installation costs of $420/m for confined corridors (existing road reserves). Open corridors costs will reduce to $300/m for the larger lines and $200/m has been used for the smaller lines.

C5 - Pipeline Costing Information has been made available by IPLEX Australia in relation to:

- Glass Reinforced Pipe (GRP). *Significant savings expected.*

C6 - Pipeline material supply and installation components of the work account for > 90%of the Circulation System Costs. Based on this reasonably high major component certainty a contingency amount of 10% has been applied to all costs.

C7 - Capital Items System Components Service Life (in years) included in the right-hand column of the Costing Estimate for the CAPEX replacement calculations.

Yours faithfully

Mike Willoughby
MIE Aust CPEng NER APEC Engineer IntPE(Aus.) RPEQ 3690

Attachments: -

1. Lake Circulation System - Cost Estimate of Intake, Circulation and Outlet System.

Mobile: 0417 073632 Email: mikewmd@bigpond.com

(1)

WALKER CORPORATION - RIVERLEA RESIDENTIAL ESTATE, SA

1-Nov-22

LAKE SALTWATER CIRCULATION SYSTEM - Cost Estimate of Intake, Circulation and Outlet System

* 2 x 710mm dia PE 100 HDPE Intake Lines

Item	Description	Base Cost/Lm	30% Install factor 1.3	Quantity	Unit	Rate	Amount	Comment	Service Life (yrs)
SWL 1									
1	**Intake Facility**								
a)	New Facility Structure and Platform				Item		$ 200,000	Sheet and CHS piling, landside platform and deck extending over water.	50
							$ 200,000		
2	**Pumps and Associated Works** (to accommodate duplication)								
a)	Pumphouse				Item		$ 50,000		50
b)	Pumps and Electric Motors (250kW)			2	No.	$ 100,000	$ 200,000	Single Pump for SWL 1 and Dual Pumps for SWL 2 and 3.	25
c)	Valving				Item		$ 20,000		25
d)	General Piping (straights, bends and pillar supports				Item		$ 20,000		25
e)	Pillar Mounted crane (3 tonne capacity)				Item		$ -	Access by Mobile Equipment.	-
f)	Access platforms/handrailing				Item		$ 20,000		25
g)	Switchboard				Item		$ 200,000		25
h)	Power Supply				Item		$ 500,000	5km @ $100,000/km	50
i)	Site Access				Item		$ 500,000	5km @ $100,000/km Construction and pipeline maintenance access track only. General maintenance to intake facility is via south along existion access.	50
							$ 1,510,000		
3	**Supply Line**								
	Circulation Phase 1 (SWL 1)								
a)	Supply and installation of Pipeline (HDPE-PE100)								
i)	Twin 710mm Class PN10 (2 x 5,300m)	$ 824		5,300	m	$ 1,071	$ 5,677,360	2 x $412/Lm = $812/LM (2 x 710mm dia. lines)	100
ii)	900mm Class PN10 (2,000m)	$ 532		2,000	m	$ 692	$ 1,383,200		100
iii)	710mm Class PN10 (700m)	$ 421		700		$ 547	$ 383,110		100
vi)	630mm Class PN10 Stub (200m)	$ 305		200	m	$ 397	$ 79,300		100
v)	360mm Class PN10 (600m)	$ 185		600	m	$ 241	$ 144,300		100
b)	Trenching x 1500mm deep, incl. bedding and backfill.								
i)	1000mm wide			3,500	m	$ 100	$ 350,000	Averaging.	
ii)	2500mm wide			5,300	m	$ 150	$ 795,000		
c)	Valving				Item		$ 100,000	Valve Costs @ $20,000 each average.	25
							$ 8,912,270		
4	**Discharge Chamber**								
a)	Chamber				Item		$ 30,000		25
b)	Access platforms/handrailing				Item		$ 10,000		25
c)	Valving				Item		$ 20,000		25
							$ 60,000		
5	**Outfall Line**								
	Circulation Phase 1 (SWL 1)								
	Supply and installation of Pipeline (HDPE-PE100)								
a) i)	1,000mm Class PN6.3 (2,100m)	$ 185		2,100	m	$ 241	$ 505,050		100
i)	630mm Class PN6.3 (2,200m)	$ 288		2,200	m	$ 374	$ 823,680		100
b)	Trenching 1000mm wide x 1500mm deep, incl. bedding and backfill.			4,300	m	$ 100	$ 430,000	Averaging.	100
c)	Inlet (outlet from lake)				Item		$ 20,000		25
d)	Outlet into Thompsens Tidal Creek.				Item		$ 20,000		25
							$ 1,798,730		
	Phase 1					Sub-total	**$ 12,481,000**		

Item	Description	30% Install factor 1.3	Quantity	Unit	Rate	Amount	Comment	Service Life (yrs)
SWL 2		Base Cost/Lm						
6	**Supply Line**							
	Circulation Phase 2 (SWL 1 + SWL 2)							
	a) Supply and installation of Pipeline (HDPE-PE100)							
	i) 360mm Class PN10 (800m)	$ 185	800	m	$ 241	$ 192,400		100
	ii) 630mm Class PN10 (100m)	$ 305	100	m	$ 397	$ 39,650		100
	b) Trenching 1000mm wide x 1500mm deep, incl. bedding and backfill.		900	m	$ 50	$ 45,000	Averaging.	100
	c) Valving			Item		$ 60,000	Valve Costs @ $20,000 each average.	25
						$ 337,050		
7	**Outfall Line**	Base Cost/Lm						
	Circulation Phase 2 (SWL 1 + SWL 2)							
	a) Supply and installation of Pipeline (HDPE-PE100)							
	i) 630mm Class PN6.3 (900m)	$ 288	900	m	$ 374	$ 336,960		100
	b) Trenching 1000mm wide x 1500mm deep, incl. bedding and backfill.		900	m	$ 100	$ 90,000		100
	c) Inlet (outlet from lake)			Item		$ 10,000		50
						$ 436,960		
	Phase 2				Sub-total	**$ 774,010**		
SWL 3		Base Cost/Lm						
6	**Supply Line**							
	Circulation Phase 3 (SWL 1 + SWL 2 + SWL 3)							
	a) Supply and installation of Pipeline (HDPE-PE100)							
	ii) 630mm Class PN10 (900m)	$ 305	900	m	$ 397	$ 356,850		100
	b) Trenching 1000mm wide x 1500mm deep, incl. bedding and backfill.		900	m	$ 100	$ 90,000		100
	c) Valving			Item		$ 20,000	Valve Costs @ $20,000 each average.	25
						$ 466,850		
7	**Outfall Line**	Base Cost/Lm						
	Circulation Phase 3 (SWL 1 + SWL 2 + SWL 3)							
	a) Supply and installation of Pipeline (HDPE-PE100)							
	i) 630mm Class PN6.3 (100m)	$ 288	100	m	$ 374	$ 37,440		100
	b) Trenching 1000mm wide x 1500mm deep, incl. bedding and backfill.		100	m	$ 100	$ 10,000		100
	c) Inlet (outlet from lake)			Item		$ 10,000		50
						$ 57,440		
	Phase 3				Sub-total	**$ 524,290**		
	Combined Total					**$ 13,779,300**		
	Add Contingency @		10%			$ 1,377,930		
	Cost per ET (12,000 Titles)				$ 1,263.10	**$ 15,157,230**		

wm developments pty ltd

Mike Willoughby
MIE Aust CPEng NER APEC Engineer IntPE(Aus) RPEQ 3690
Mobile 0417 073632

23. Appendix M – Lake Circulation Annual Operational & Maintenance Costs

wm developments pty ltd

ACN 073 297 659
ABN 23 073 297 659

M Willoughby CPEng, RPEQ
19 Yamanie Crt,
Nerang, Qld 4213
Mob: 0417 073 632

31th October 2022

WALKER BUCKLAND PARK DEVELOPMENTS P/L
C/- Suite 3 Level 1, 128 Bundall Rd,

Attention: Mike Lyons

Re: Riverlea Residential Development – Saltwater Lakes Proposal

Lake Circulation System - Preliminary Annual Operational and Maintenance Cost Estimate

A Saltwater Lakes System has been proposed to replace the open drain system included in the Original Development Layout.

With a desire to provide the best liveable development outcome possible, and the nearby source of bulk saltwater, a re-engineering opportunity has been undertaken that delivers a Saltwater Lakes System (SWL) with stormwater drainage integration (lakes detention) combined with significant areas of adjacent parkland.

Preliminary Lake Circulation System Annual Operational and Maintenance Costs, subject to turnover refinement (including reticulation pipe and pump size refinements) for the completed three (3) Lake System (SWL's 1, 2 and 3) are estimated at: -

- 2 x 170 kW Pumps $ 471,072

Refer to the details provided in the attachments.

Note that the developer is currently in liaison with the Electrical power Provider reviewing alternative renewable energy supply options.

Yours faithfully

Mike Willoughby
MIE Aust CPEng NER APEC Engineer IntPE(Aus.) RPEQ 3690

Mobile: 0417 073632 Email: mikewmd@bigpond.com

Attachments: -

1. Spreadsheet Summary of the Circulation Phasing Costs.
2. WSP Reporting dated February 2022 – Relevant Extracts.
3. Supporting Sketches and Construction Commentary.

Mobile: 0417 073632 Email: mikewmd@bigpond.com

WALKER CORPORATION - RIVERLEA RESIDENTIAL ESTATE, SA

1/11/2022 7:29

LAKE SALTWATER CIRCULATION SYSTEM - Annual Operational and Maintenance Cost Estimate.

* **2 x 710mm dia PE 100, HDPE Intake Lines**

Item	Description		Quantity per Year	Unit	Rate	Amount	Comment
Circulation Phase 1 (Lake SWL 1 Operational)							
Annual Running Costs							
1	Pumping	1 x 170kW Pump - 10 hours per day operation for 365 days plus 15 days of 20 hours per day (operation for one pump).	504,260	kW-h	$ 0.37	$ 186,576	*1 x 170kW Alt - Subject to Line Size/Turnover Refinement*
2	Operator Attendance	Twice a week for 2 - 4 hours each attendance	416	Man-hrs	$ 120.00	$ 49,920	2 x Man Maint. Team (plus misc. vehicle/equip. costs).
3	Water Quality	Sampling and Testing	12	Mth	$ 1,500.00	$ 18,000	
		Annual Operational Costs				$ 254,496	
Planned Maintenance Costs for the First 5 year Period							
1	Pump Maintenance	Replacement of worn parts, maintenance as required - estimated at 30% of new pump costs	1	Each	$ 30,000.00	$ 30,000	Pump Cost $ 100,000 (1 of)
2	Valve Maintenance	Replacement of worn parts, maintenance as required - estimated at 30% of new valve costs.		Item		$ 20,000	Valve Cost $ 60,000
						$ 50,000	
		Annual Maintenance Costs				$ 10,000	
		5-Year Operational Costs				**$ 1,322,481**	
					Cost per Annum	**$ 264,496**	

WALKER CORPORATION - RIVERLEA RESIDENTIAL ESTATE, SA

1/11/2022 7:29

LAKE SALTWATER CIRCULATION SYSTEM - Annual Operational and Maintenance Cost Estimate.

* **2 x 710mm dia PE 100, HDPE Intake Lines**

Item	Description		Quantity per Year	Unit	Rate	Amount	Comment
Circulation Phase 2 (Lakes SWL 1 and 2 Operational)							
Annual Running Costs							
			672,347	kW-h	$ 0.37	$ 248,768	*2 x 170kW Alt - Subject to Line Size/Turnover Refinement*
1	Pumping	1.5 x 170kW Pumps - 10 hours per day operation for 365 days plus 15 days of 20 hours per day (operation for two pumps).					
2	Operator Attendance	Twice a week for 2 - 4 hours each attendance	416	Man-hrs	$ 120.00	$ 49,920	2 x Man Maintenance Team (plus misc. vehicle/equip. costs).
3	Water Quality	Sampling and Testing	12	Mth	$ 1,500.00	$ 18,000	
		Annual Operational Costs				$ 316,688	
Planned Maintenance Costs for the First 5 year Period							
1	Pump Maintenance	Replacement of worn parts, maintenance as required - estimated at 30% Of new pump costs	2	Each	$ 30,000.00	$ 60,000	Pumps Cost $ 200,000 (2 of)
2	Valve Maintenance	Replacement of worn parts, maintenance as required - estimated at 30% of new valve costs.		Item		$ 24,000	Valve Cost = $ 60,000 + $ 20,000 = $ 80,000
						$ 84,000	
		Annual Maintenance Costs				$ 16,800	
		5-Year Operational Costs				**$ 1,667,441**	
					Cost per Annum	**$ 333,488**	

WALKER CORPORATION - RIVERLEA RESIDENTIAL ESTATE, SA

1/11/2022 7:29

LAKE SALTWATER CIRCULATION SYSTEM - Annual Operational and Maintenance Cost Estimate.

* **2 x 710mm dia PE 100, HDPE Intake Lines**

Item	Description		Quantity per Year	Unit	Rate	Amount	Comment
Circulation Phase 3 (Lakes SWL 1, 2 and 3 Operational)							
Annual Running Costs & Maintenance							
1	Pumping	2 x 170kW Pumps - 10 hours per day operation for 365 days plus 15 days of 20 hours per day (operation for two pumps).	1,008,520	kW-h	$ 0.37	$ 373,152	*2 x 170kW Alt - Subject to Line Size/Turnover Refinement*
2	Operator Attendance	Twice a week for 2 - 4 hours each attendance	416	Man-hrs	$ 120.00	$ 49,920	2 x Man Maintenance Team (plus misc. vehicle/equip. costs).
3	Water Quality	Sampling and Testing	12	Mth	$ 1,500.00	$ 18,000	
		Annual Operational Costs				$ 441,072	
Planned Maintenance Costs for the First 5 year Period							
1	Pump Maintenance	Replacement of worn parts, maintenance as required - estimated at 30% 0f new pump costs	2	Each	$ 60,000.00	$ 120,000	Pumps Cost $ 200,000 (2 of)
2	Valve Maintenance	Replacement of worn parts, maintenance as required - estimated at 30% of new valve costs.		Item		$ 30,000	Valve Cost = $ 60,000 + $ 20,000 + $ 20,000 = $ 100,000
						$ 150,000	
		Annual Maintenance Costs				$ 30,000	
		5-Year Operational Costs				**$ 2,355,362**	Completed Development Cost per ET (12,000 Titles)
					Cost per Annum	**$ 471,072**	$ 39.26

wm developments pty ltd

Mike Willoughby
MIE Aust CPEng NER APEC Engineer IntPE(Aus) RPEQ 3690
Mobile 0417 073632

(2)

Walker Corporation

Riverlea Development

Salt Water Lakes Circulation System Concept Review Report

FEBRUARY 2022

CONFIDENTIAL

wsp

DOCUMENT NAME	DOCUMENT TITLE / DESCRIPTION
Riverlea SWL circulation system brief 30 11 2021	WSP proposed scope – TSA generated
Riverlea SWL circulation system Feasibility engineering design	Feasibility Engineering Design Deliverables plan
Riverlea SWL circulation system short report	Short Report Deliverables plan
Technical Memorandum – Use of Chapman Creek to Supply Saline Water to Riverlea Development	Technical Memorandum – Use of Chapman Creek to Supply Saline Water to Riverlea Development
BE170039-SK106-E	Burchills Engineering Drawing – Seawater intake line, general arrangement & options
BE170039-SK113-B	Burchills Engineering Drawing – General site earthworks pre-design and conceptual
BE170039-SK117-C	Burchills Engineering Drawing – Seawater intake line, general arrangement

2.2 Non-reliance Information

- Vendor datasheets
- Estimated pipeline fittings, hydraulic assumptions by WSP, as per standard design practice.
- High resolution imagery derived from WSP Systems

2.3 Design Basis

Circulation System Design:

Intake Location / Outlet Location:

- Refer Lakes outlet discharge pipe Drawings (BE170039-SK106-E, BE170039-SK113-B, BE170039-SK117-C).
- Outlet locations are split over 3 areas, 2 x Phase 1 and 3x Phase 1 (1x new). Hydraulic design base case shall be governed by furthest discharge in Phase 1.
- Intake revised outside of existing Cheetham Lake Intake Facility (previous inclusive)

Staging:

- 2 Major lake System (Eastern and Western)

Pipeline Routes

- As per design drawings Drawings (BE170039-SK106-E, BE170039-SK113-B, BE170039-SK117-C).
- Pipework sizing revised, as per M. Willoughby advice 08/02/2022.

Seawater Intake Pump Station Design Criteria:

Pump Selection Design Conditions:

The pumps are selected based on the described maximum operation criteria, as represented by maximum discharge, minimum suction and highest roughness rates, for furthest discharge. The Phase 1 plans include multiple discharge points

of the pipeline, to support ultimate pumping the selection has been based on a single delivery to furthest point. The Phase 3 plans include an additional delivery at nearer location, it is anticipated this will be managed through a flow control valve and equalise pressure to the Phase 1 delivery point. Therefore, the governing hydraulic design case is as follows;

Phase 2/3 Flow Rate to the furthest discharge point of Phase 1.

Delivery Volume:

- Phase 1: 408ML
- Phase 2: 386ML
- Phase 3: 318ML
- Total Volume; Final: 1100 ML

Turnover:

- 40-days, previously 20.

Gravity Outlet:

- 24 hrs/day

Calculated pumping rates:

- Phase 1: 240L/s (12 Hr/day Cycle), 1 Pump operation
- Phase 2/3: 640L/s (12 Hr/day Cycle) (320L/s per pump), 2 Pump operation
- Opportunity for optimisation in subsequent phase of design.

Intake pump station at Chapman Creek

- Pump CL = RL -2.5m AHD (assumption).
- Low Water Level, as per mean low tide = -1.09mAHD

Discharge high water point;

- Phase 1: 6.5 AHD (Invert) (assumption)
- Phase 3: 7.0m AHD (Invert) (assumption)

Top of Bank:

- 7.5m max. AHD

Pipeline:

- 8.8km; HDPE PE100 SDR17 (PN10)
- Phase 1 & Phase 2/3: OD710 HDPE
- Based Burchills on SK-106: Seawater intake line and general arrangement options, with revision to sizing as per direction from M. Willoughby 08/02/2022.

Pipeline Discharge:

- Phase 1: 2x Discharge Points
- Phase 2/3: Single Discharge, in addition to Phase 1.

Operating philosophy:

- 365 days per year, 12 hours per day

Emergency pumping:

- To be confirmed in subsequent phase.

Design life:

- Pump Station Structure
  - 50yrs design life
  - 25yrs service life
- Pumps
  - 25yr design life
- HDPE Pipes (above ground)
  - 50yrs
- HDPE Pipes (submerged / buried)
  - 100yrs

2.4 Assumptions Made

ENGINEERING CONSTANTS BASED ON SEAWATER		
Temperature (°C)	20	
Density, *p* (kg/m3)	1031	seawater @ 13°C
Dynamic viscosity, *u* (Ns/m2)	0.00129	
Accel gravity, g (m/s2)	9.81	
Power cost, ($/kWhr)	0.37	https://www.agl.com.au/-/media/aglmedia/documents/help/rates-contracts/market-contracts/2020/07/2020-my-pcp---agl-sa-elec-website-pricing-v7.pdf
Hydraulic roughness, minimum, *k* (mm)	0.30	Slightly fouled pipe
Hydraulic roughness, mean, *k* (mm)	0.15	Ages, no fouling
Hydraulic roughness, maximum, *k* (mm)	0.06	Clean / new pipe

wsp

2.2 Preliminary outputs:

Pump Model	NP 3312/835 3~ 670	NP 3531/835 3~ 1070
Motor size	250kW	170kW
Pump overall efficiency at duty point	72.6%	77.5%
Duty power	211.90 kW	132.70 kW
No. of pumps operating	2.00	2.00
Power consumption	1,546,870.00 kWhr/yr	968,710.00 kWhr/yr
Power consumption (incl. Emergency Op.)	1,610,440.00 kWhr/yr	1,008,520.00 kWhr/yr
Power cost	$0.37/kWhr	
Running cost (power) per 1yr	$ 572,341.90	$ 358,422.70
Running cost (power) incl. Emergency Op. per 1yr	$ 595,862.80	$ 373,152.40
Running cost (power) per 5yrs	$2,861,709.50	$1,792,113.50
Running cost (power) incl. Emergency Op. per 5yrs	$2,979,314.00	$1,865,762.00

3. Next Steps

- Optimisation of the water distribution system via:
  - detailed hydraulic modelling
  - alignment/route enhancement, based on survey and geotechnical inputs
  - material selections
  - design life of assets
  - power usage / reduction vs demands
- Proposed operability and maintainability scenarios to be developed in consultation with the Council and their field operations staff.
- Preliminary design drawings – to enable an understanding of the fit/form/function of the system

Your sincerely

Ben McDonald
Engineering Director

Mike Campbell
Senior Mechanical Engineer

24. Appendix N – General Maintenance Comparison Costs

wm developments pty ltd

ACN 073 297 659
ABN 23 073 297 659

M Willoughby CPEng, RPEQ
19 Yamanie Crt,
Nerang, Qld 4213
Mob: 0417 073 632

4th November 2022

WALKER BUCKLAND PARK DEVELOPMENTS P/L
C/- Suite 3 Level 1, 128 Bundall Rd,

Attention: Mike Lyons

Re: Riverlea Residential Development – Saltwater Lakes Proposal

Overview of General Maintenance Costs – Preliminary Comparison of Open Drainage Channels vs Lake Detention Stormwater Management Options

A Saltwater Lakes System has been proposed to replace the open drain system included in the Original Development Layout.

With a desire to provide the best liveable development outcome possible, and the nearby source of bulk saltwater, a re-engineering opportunity has been undertaken that delivers a Saltwater Lakes System (SWL) with stormwater drainage integration (lakes detention) combined with significant areas of adjacent parkland.

A comparison of alternative layout annual maintenance cost estimates (addressing landscaping and lake circulation and water body maintenance) has been prepared to assess how the Proposed Lakes and Original Drainage Channels compare in relation to annual maintenance costs and is presented below: -

- Original Drainage Channels $ 6,365,032
- Saltwater Lakes Proposal $ 3,238,936

Refer to the details provided in the attachments.

Yours faithfully

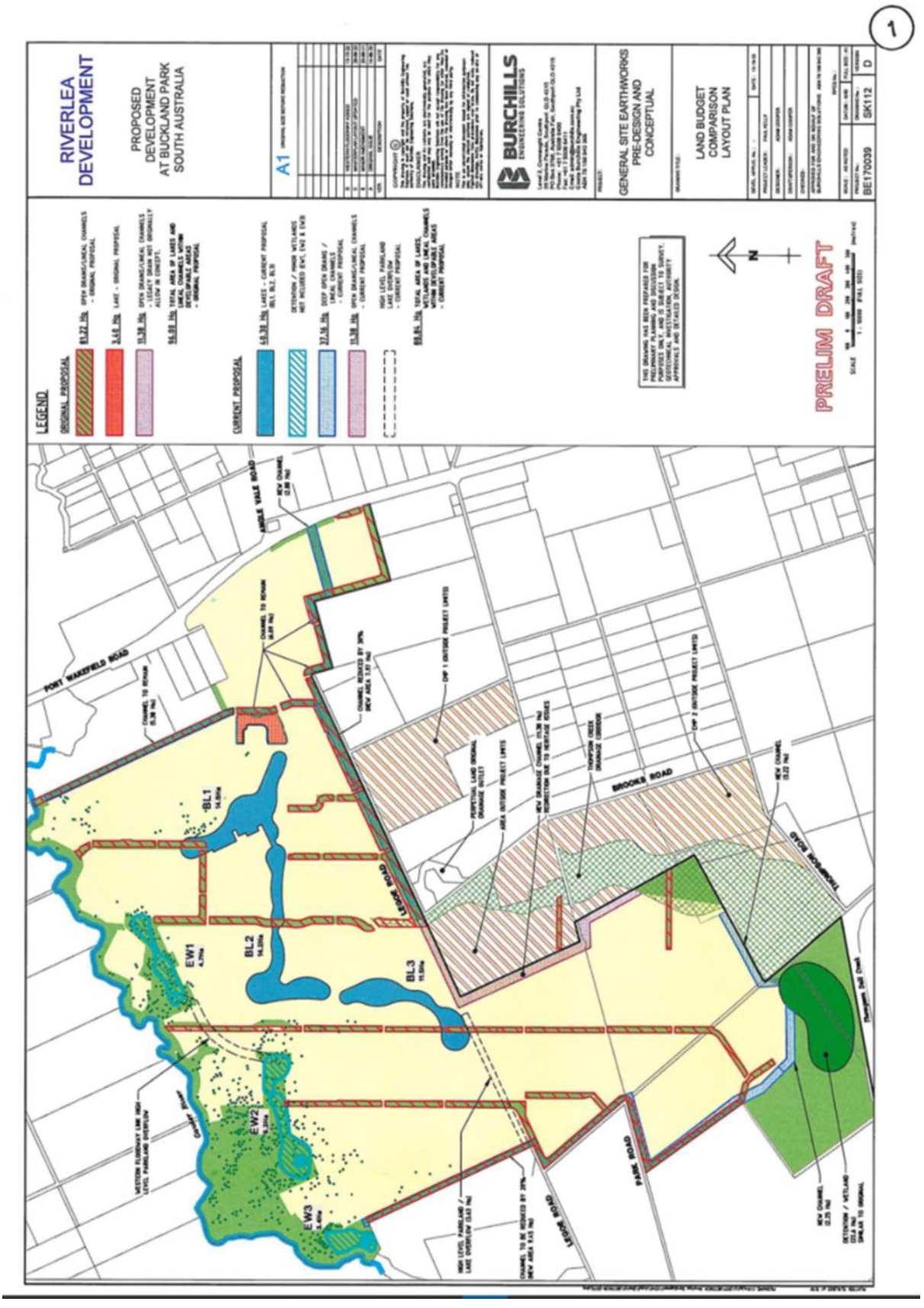
Mike Willoughby
MIE Aust CPEng NER APEC Engineer IntPE(Aus.) RPEQ 3690

Mobile: 0417 073632 Email: mike@wmdev.com.au

Attachments: -

1. Sketch SK112 which details the system changes resulting from the Saltwater Lakes Proposal
2. Spreadsheet Summary Comparison of Costs.
3. Commentary on the spreadsheet components and assumptions
4. BMT Annual Cost Estimate for the Operation, and Maintenance of the Riverlea Lakes.
5. Supporting Sketches.
6. Updated PLACE Reporting

Mobile: 0417 073632 Email: mike@wmdev.com.au


RIVERLEA DEVELOPMENT
PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA
A1
BURCHILLS
ENGINEERING SOLUTIONS
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL
LAND BUDGET COMPARISON LAYOUT PLAN
BE170039
SK112
D
LEGEND
ORIGINAL PROPOSAL
CURRENT PROPOSAL
PRELIM DRAFT
PORT WAKEFIELD ROAD
ANGLE VALE ROAD
BROOKS ROAD
LEWIS ROAD
PARK ROAD
BL1
BL2
BL3
EW1
EW2
EW3

RIVERLEA DEVELOPMENT, PORT WAKEFIELD, SOUTH AUSTRALIA

OVERVIEW OF ANNUAL MAINTENANCE COSTS - Comparison (delta costs) of Open Drainage Channels vs Lake Detention Stormwater Management Options

Items	CHANNELS (Open Drains) Components	Qty	Unit	Rate	Maint. Cycles	Amount	LAKES DETENTION Components	Qty	Unit	Rate	Maint. Cycles	Amount	Comment
1	**Gawler River Parklands**					NA	**Gawler River Parklands (detention flood bypass)**					NA	Similar Common Costs
2	**Original Channel Areas**	812,000	m2	(Burchills Calcs.)			**Remaining Channel Areas**	306,300	m2	(Burchills Calcs.)			Original of 81.2Ha of Channel reduced to 30.6Ha (remaining).
	Av. Channel Width	60	m				Av. Channel Width	60	m				
	Length of Channel (Av Width 60m)	13,533	m				Length of Channel (Av Width 60m)	5,105	m				
	Channel Controls @ 100m crs	100	m				Channel Controls @ 100m crs	100	m				
	Segment Areas (100m x 60m)	6,000	m2					6,000	m2				
1	Swales (between ponds/junctions)	135	No.	$ 200.00	14	$ 378,933	Swales (between ponds/junctions)	51	No.	$ 200.00	14	$ 142,940	
2	Ponds	135	No.	$ 200.00	14	$ 378,933	Ponds	51	No.	$ 200.00	14	$ 142,940	Allow 14 No. Parkland Maintenance Cycles - 4 Mths @ 2/mth, 4 Mths @ 1/mth and 4 Mths @ 0.5/mth.
3	Junctions	20	No.	$ 100.00	14	$ 28,000	Junctions	10	No.	$ 100.00	14	$ 14,000	
4	General (average maintenance)	812,000	m2	$ 0.93	7	$ 5,286,120	General (average maintenance)	306,300	m2	$ 0.93	7	$ 1,994,013	
						$ 6,071,987						$ 2,293,893	Mowing/slashing, spraying, weeding, vermin, clean-up, fire hazard, rubbish.
3	**Northern Area** (Small 3.4 Ha Freshwater Lake - ORIGINAL APPROVAL)						**Northern Area** (40.3 Ha of Saltwater Lakes)						
1	System Maintenance - Nominal			*Factor x*	*2.0*		System Maintenance					*$ 471,072*	*Refer MW Estimate (Mechanical Services).*
	Lake 1	34,000	m2	$ 2.34	NA	$ 79,454	Lake 1	146,428	m2	$ 1.17	NA	$ 171,092	
							Lake 2	141,606	m2	$ 1.17	NA	$ 165,457	
							Lake 3	115,131	m2	$ 1.17	NA	$ 134,523	Sum = $ 471,072
								403,165					40.3 Ha of Saltwater Lakes Proposed
2	Water Body Maintenance			*Factor x*	*2.0*		Water Body Maintenance						
	Lake 1	34,000	m2	$ 0.40	NA	$ 13,600	Lake 1	146,428	m2	$ 0.20	NA	$ 29,286	Flotsum, jetsom and floating weed removal
							Lake 2	141,606	m2	$ 0.20	NA	$ 28,321	ditto
							Lake 3	115,131	m2	$ 0.20	NA	$ 23,026	ditto
3	Edge Maintenance			*Factor x*	*2.0*		Edge Maintenance						
	Lake 1	1,000	m	$ 5.44	14	$ 76,160	Lake 1	1,030	m	$ 2.72	8	$ 22,413	
	All Natural Edge						Lake 2	1,975	m	$ 2.72	8	$ 42,976	Maintenance of natural edge sections (lengths) of lake only
							Lake 3	1,665	m	$ 2.72	8	$ 36,230	
							Lake Natural Edge total length	4,670					
4	General Maintenance Overview/Contingency		Item			25,690	General Maintenance Overview/Contingency		Item			$ 62,032	
					Sum	$ 194,904			Av.	$ 1.77	Sum	$ 715,356	BMT - additional item including routine inspections, aquatic vegetation and pest management, desilting and local catchment stormwater detention recovery/clean-up.
5	Water Quality Monitoring (Sampling and Testing)						Water Quality Monitoring (Sampling and Testing) - provided by Consulants BMT						BMT - Note monitoring of the freshwater kake is expected to be significantly greater that that of the saltwater lakes.
1	Water quality monitoring	1	No.	$4,135.75	12	$ 49,629	1 Water quality monitoring	1	No.	$7,955.58	12	$ 95,467	
2	Ecological surveys	1	No.	$12,990.00	2	$ 25,980	2 Ecological surveys	1	No.	$23,210.00	2	$ 46,420	
3	Sediment Accumulation Monitoring	1	No.	$7,599.00	0.33	$ 2,533	3 Sediment Accumulation Monitoring	1	No.	$11,400.00	0.33	$ 3,800	
					Sum	$ 78,142					Sum	$ 145,687	
6	Water Quality Pre-treatment Maintenance						Water Quality Pre-treatment Maintenance						
1	Gross Polution Traps (GPTs) - collecting solids/rubbish (Common Costs)						1 Gross Polution Traps (GPTs) - collecting solids/rubbish (Common Costs)						Common Costs between both options - similar outlets numbers.
2	Wetland Maintenance (freshwater maintenance intensive)		Item			$ 20,000	2 Bio-Retention Water Quality Treatment	30	No.	$ 200.00	14	$ 84,000	Nominal 10 per lake or 30 in total - cyclical basis vegetation maintenance only.
7	Higher Level Parkland Corridors (Not Channels)					NA	Higher Level Parkland Corridors (Not Channels)					NA	Similar areas for both concepts.
4	**Southern Area** (no lakes)					NA	**Southern Area** (no Lakes)					NA	
1	Eastern Watercourse (Channel 1 extension)						Eastern Watercourse (Channel 1 extension)						This Channel 1 Outlet Change is common to both Options
2	Western Channel						Western Channel						Common Costs between concept options
3	Higher Level Parkland Corroidors					na	Higher Level Parkland Corroidors					na	Similar areas for both concepts.
5	**Southern Peninsular Detetion Basin Area.**					NA	**Southern Peninsular Detetion Basin Area.**					NA	Common costs between concept options
					Total	6,365,032					Total	3,238,936	
										Savings		3,126,096	

Rates from Waker Corp (Adrian Smith)

Source = Landscape Maintenance Contractors tendered sumbissions September 2022

Lake edge	$ 2.72	per lin m	
Drainage channel	$ 0.93	per m2	
Reserves around lake edge	$ 2.71	per m2	

AS

Tue 1/11/2022 4:33 PM

Adrian Smith

Maintenance Rates for lake Precinct

To Mike Lyons

Hi Mike,

Maintenance rates as follows:

Drainage Channel Reserves

Using the architects OPC from the drainage channel landscaping, we have forecasted the following:
Drainage channel 1 – 99,500 m2
Maintenance $92,880 per annum
Rate = **$0.93/m2** per annum

Lakeside Reserves

Using Riverlea Blvd actual maintenance tender rates for comparison.

Riverlea Blvd Stage 1 – 36,046 m2

Programmed	$47,734	$1.32/m2 PA
Eco Dynamics	$52,347	$1.45/m2 PA
LCS	$119,470	$3.31/m2 PA
Space	$85,925	$2.38/m2 PA

Riverlea Blvd Stage 2 – 14,381 m2

Programmed	$32,761	$2.28/m2 PA
Eco Dynamics	$52,347	$3.64/m2 PA
LCS	$55,770	$3.88/m2 PA
Outside Ideas	$49,335	$3.43/m2 PA

Mean Rate = $2.71/m2 per annum for full service maintenance.
Consider CPI increase to this.

Lake Edge

1 man, 1 day should complete 2,000m of litter pick up and spot spraying.
8 visits PA.
$680 per visit x 8 = $5,440
$5,440/2,000m = **$2.72/m of lake edge PA.**

Adrian.

Adrian Smith
Senior Project Manager

Riverlea

SA's fastest selling master planned community

Walker Corporation
Riverlea Sales and Discovery Centre
9 Bonnin Crescent, Riverlea Park SA 5120
T +61 8 7081 4444 M +61 427 022 488
www.walkercorp.com.au

Postal Address
PO Box 522
Virginia SA 5120

walker

SALTWATER LAKES (SWL) vs OPEN CHANNEL MAINTENANCE COSTS COMMENTARY: -

1. **Gawler River Parklands**

   The Western floodway is an area of existing parkland to the south of the Gawler River that will be lowered marginally (by an average of 1.0m) and will be re-shaped with a low-flow invert and detention areas. Breakout floodwaters from the Gawler River are planned to be diverted to the west through this area (returning to the Gawler River downstream). These floodwaters were originally to be diverted into the proposed open channel system through the site.

   The floodway adds significant floodwater breakout management capability in terms of the possible large increase (4-fold) in discharge volume because of the possible implementation Northern Floodway. No Northern Floodway waters will need to be managed southward through the site.

   The area planned for the floodway was simply parkland in the original proposal and whilst we are utilising the area for regional flood breakouts (> Q10), the area will essentially remain as open parkland receiving small catchment discharges from adjacent development areas.

   There may be minor changes in the maintenance regime for the corridor, however, it should remain essentially as it was originally proposed with some of the residential catchment diverted to the north into this area. The residential fringe provides the raised corridor edge which is planned to contain the floodwater breakouts.

   Deliberation *– there would have always been a residential platform lip that needed to be drained and potentially stormwater drainage from the platform north into this parkland, and as such there would be some additional maintenance costs (minimal) associated with the change. This is more than offset by potential costs associated with the management of floodwaters to the south through the site.*

2. **Original Channel Areas (Channel Areas and Length)**

   The length of the area of the original channels has been measured at and an average channel width of 60m applied to calculate a total area of original channels. Water quality treatment swales and ponds have been added at intervals provided in the original reporting and cyclical maintenance intervals have been applied and costed.

   Some areas of channel remain from the original concept.

   A general maintenance cost has been applied to the total channel areas and specific costs allocated to the channel invert components based on the following components:

   2.1 Swales in the low-flow invert (length between ponds) – costs based on number items

   2.2 Ponds in the low-flow invert – costs based on number of items

   2.3 Junctions of channel inverts – costs based on number of items

2.4 General Maintenance of Drainage Channel Reserves, refer Walkers Costings - benched and battered drainage corridor areas incl. the low-flow invert. Refer Walkers tendered pricing in the second attachment (Sheet 2).

Deliberation *- there has always been a concern with the delivery of the maintenance of the drainage corridor invert within major discharge corridors with regards to:*

a) the location of in-line water quality devices within these primary drainage channels
b) the existing water table interface (invert below water table/possible saline intrusions)
c) the ability to vegetate, establish and successfully maintain the inverts in the environs of points (a) and(b)

This risk in largely eliminated by the Saltwater Lakes (SWL) proposal.

3. Northern Area introducing a NEW LAKE CONCEPT (Saltwater Lakes with Water Quality Circulation) – North of Legoe Road

With a desire to provide the best liveable development outcome possible, and the nearby source of bulk saltwater, a re-engineering opportunity has been undertaken that delivers a saltwater lakes system (SWL) with stormwater drainage integration (lakes detention) combined with significant areas of adjacent parkland.

The lake maintenance cost comparison is broken into the following components:

3.1 Lake System Maintenance Costs (referring to the circulation system delivering water quality requirements). This is a separate cost exercise and the costs have been introduced and presented as a cost per square metre of lake areas. Note we have used the SWL System Cost per m2 for the Original Freshwater Lake for simplicity.

3.2 Lake Water Body Maintenance – costs associated with flotsam/jetsam collection and disposal.

3.3 Lake Edge Maintenance, refer Walkers Costings – costs have been based on the length of the natural edge component of the lakes only and a cyclical maintenance regime. Refer Walkers tendered pricing in the second attachment (Sheet 2).

3.4 General Maintenance Overview/Contingency, refer BMT Costings - routine general inspections, possible aquatic vegetation and pest management, possible siltation management and catchment recovery/clean-up from local stormwater detention/water level surcharge events.

3.5 Lake Water Quality (sampling and testing), refer BMT Costings:
1. Water Quality Monitoring
2. Ecological
3. Sediment Accumulation Monitoring

3.6 Lake Water Quality (piped stormwater outlet discharge treatment prior to entering the lakes):

1. GPT's
2. Bio-retention areas

3.7 Note that Internal High-level Parkland Corridors incorporate local catchment drainage and connect parkland nodes throughout the development. Similar parkland corridors would have been a logical inclusion of all park linkages included in the Original Overall Concept Plan.

These corridors contribute to the site landform and drainage in the following ways: -

- ✓ They allow the local catchment areas to be reduced, minimising pipe sizes and pipe depths to inverts.
- ✓ They provide flexibility with secondary service alignment options (service separation) and the minimisation/avoidance of service clashes which contribute to the sitewide lowering of service levels. Raising stormwater outlets is a design priority.
- ✓ Provide higher-level parkland linkages and overland flow paths for larger local stormwater events.
- ✓ They assist in to minimising the bulk earthworks by reducing the fill quantities generally.

It should be noted that the Original Concept Masterplan included a single 3.5Ha freshwater Neighbour Centre Lake with water supplied from the Western Reticulation System Virginia (WRSV).

Deliberation *– component costs for comparative lake maintenance items have been included in the Overview of Annual Maintenance Costs Spreadsheet.*

4. Southern Area (no lakes) – South of Legoe Road

The original channel proposal is maintained for this area based on the philosophy that we have perimeter channel drainage and Internal High-level Parkland Corridors which incorporate local catchment drainage and connect all parkland nodes.

5. Southern Peninsular Detention Basin

This basin area remains as per the original concept containing the Thompsons Creek Outfall which includes additional drainage from the Riverlea Site that requires discharge hydrograph retention prior to release into the original channel.

Mike Willoughby

ANNUAL COST ESTIMATE FOR OPERATION, MAINTENANCE & MONITORING OF RIVERLEA LAKES (BMT)

All costs are approximate only.

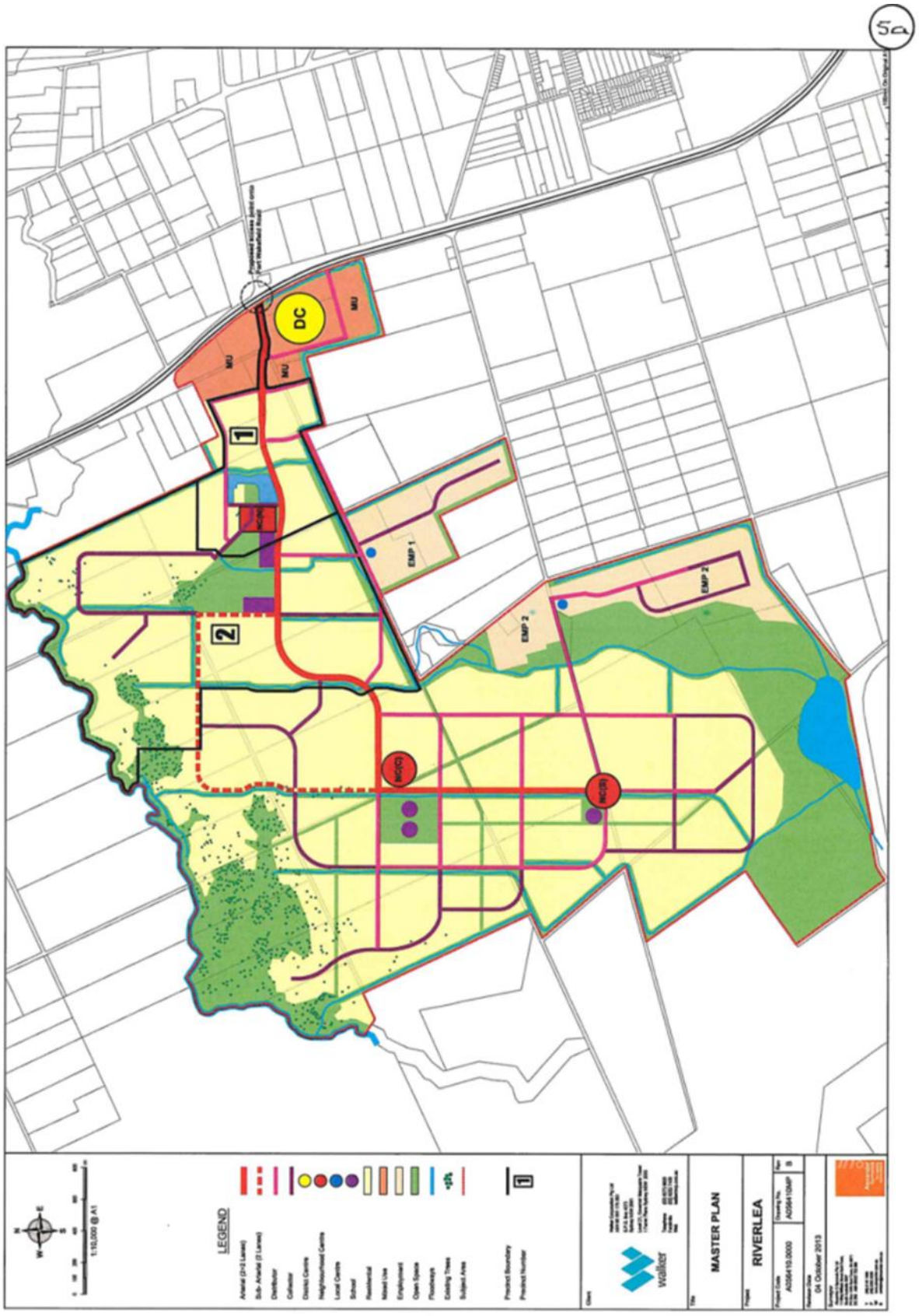
Cost Summary

Part	Cost Amount ($, excl GST)	Comments
MAINTENANCE	$62,032	
WATER QUALITY MONITORING	$95,467	
ECOLOGICAL SURVEYS	$46,420	
SEDIMENT ACCUMULATION MONITORING/ BATHYMETRY SURVEY	$3,800	
TOTAL COST ESTIMATE	**$207,719**	
CONTINGENCY COST ESTIMATE (20%)	$41,544	
TOTAL COST ESTIMATE WITH 20% CONTINGENCY	**$249,263**	

Cost Itemisation

Item Ref.	Item Description	Quantity per Year (Units)	Units	Rate ($/unit)	Cost Amount ($)	Comments
	MAINTENANCE					
M1	**ROUTINE INSPECTION, LITTER MANAGEMENT AND TERRESTRIAL WEED MANAGEMENT**					
a)	Provision of a team of two persons undertaking inspections and manual litter removal at fortnightly intervals (16 hours duration each)	832	Personnel hours	65	$54,080	Fortnightly, 2 days each, 2 people.
M2	**AQUATIC VEGETATION MANAGEMENT**					
a)	Provision of team of 2 persons undertaking manual aquatic vegetation removal and disposal activities 4 times per year (4 days duration each)	256	Personnel hours	65	$16,640	
M3	**ANIMAL PEST MANAGEMENT**					
a)	Provision of team of 2 persons undertaking removal of pest species and disposal activities two times per year (16 hours each time)	64	Personnel hours	65	$4,160	
M4	**DESILTING**					
a)	Provision of team of 2 persons for two days per point of discharge to lakes to desilt every 5 years	128	Personnel hours	65	$8,320	Allow 20 points of discharge
b)	Excavation and disposal of sediment. Quantity of sediment to be removed (m^3) every 20 years.	300	m^3 of sediment	100	$30,000	40 ha lake at 15 mm/year
M5	**POST FLOOD EVENT MAINTENANCE**					
a)	Provision of team of 2 persons for 14 days to clean up after a flood event. It is assumed that post event flood event clean up will be required approximately every 5 years (expecting that small events will not be associated with a need for maintenance	45	Personnel hours	65	$2,912	Assumes includes disposal of collected material
	TOTAL COST for MAINTENANCE				**$62,032**	
	ECOLOGICAL SURVEYS					
	Recommended in Lake IMP to occur six-monthly for approx 3 years post-construction. Following this, to be collected every 5 years.					
E1	**AQUATIC ASSESSMENT INCLUDING FISH SURVEY, BENTHIC FAUNA SURVEY AND AQUATIC FLORA SURVEY**					
a)	Provision of team of 2 persons for three days per monitoring event (twice per year)	96	Personnel hours	200	$19,200	
b)	Equipment hire (e.g. boat hire, electrofisher, nets)	2	per survey	450	$900	
c)	Provision of one individual for activities before and after monitoring (e.g. instrument calibration, preparation, clean-up) - a total of 8 hours per survey	16	Personnel hours	200	$3,200	
E2	**MOSQUITO SURVEY**					
	Collection and analysis assumed to occur at six locations.					
a)	Collection of samples	32	Personnel hours	225	$7,200	
b)	Analysis of samples and brief report	32	Personnel hours	225	$7,200	
E3	**LABORATORY ANALYSIS OF SAMPLES**					
	Analysis assumed to be undertaken for a total of 12 samples (4 locations, with 3 samples collected at each site) per sampling event, two times per year					
a)	Lab costs for macroinvertebrate assessment	24	per sample	230	$5,520	
E4	**RESULTS REVIEW & REPORTING**					
a)	Assumed one individual for a total of 8 hours per sampling event (twice per year)	16	Personnel hours	200	$3,200	
	TOTAL COST for ECOLOGICAL SURVEYS				**$46,420**	
	SEDIMENT ACCUMULATION MONITORING/ BATHYMETRY SURVEY					
	It is proposed that the depth of accumulated sediment will be measured using core sampling and visual inspection of the samples along with a bathymetric survey. The bathymetric survey is proposed to be via a single beam dual frequency (50 and 200 kHz) echo sounder mounted to a survey vessel. To occur once every 3 years.					
S1	**SITE MONITORING**					
a)	Provision of team of 2 persons for two days per monitoring event (once every 3 years)	10.7	Personnel hours	200	$2,133	
c)	Equipment hire (e.g. boat hire, echo sounder, trible dGPS)	0.3	per survey	1000	$333	
d)	Provision of one individual for activities before and after monitoring (e.g. instrument calibration, preparation, clean-up) - a total of 8 hours per survey	2.7	Personnel hours	200	$533	
S2	**RESULTS REVIEW & REPORTING**					
a)	Assumed one individual for a total of 12 hours per sampling event (once every 3 years)	4.0	Personnel hours	200	$800	
	TOTAL COST for SEDIMENT ACCUMULATION MONITORING/ BATHYMETRY				**$3,800**	

	WATER QUALITY MONITORING						
WQ1	**PHYSICAL WATER QUALITY & SEDIMENT MONITORING & SAMPLE COLLECTION- INTERNAL**						
a)	Provision of team of 2 persons for one day per monitoring event (twelve per year)		192	Personnel hours	150	$28,800	
b)	Ice/ water		12	per survey	20	$240	
c)	Equipment hire (e.g. WQ instrument, grab sampler, kayak)		12	per survey	200	$2,400	
d)	Provision of one individual for activities before and after monitoring (e.g. instrument calibration, preparation, clean-up) - a total of 4 hours per survey		48	Personnel hours	150	$7,200	
WQ2	**PHYSICAL WATER QUALITY SAMPLE COLLECTION- EXTERNAL**						
a)	Provision of 6 hours per monitoring event (twelve per year)		72	Personnel hours	150	$10,800	
b)	Ice/ water		12	per survey	20	$240	
c)	Equipment hire (boat)		12	per survey	250	$3,000	
d)	Provision of one individual for activities before and after monitoring (e.g. instrument calibration, preparation, clean-up) - a total of 4 hours per survey		48	Personnel hours	150	$7,200	
WQ3	**LABORATORY ANALYSIS OF WATER & SEDIMENT SAMPLES**						
	Analysis assumed to be undertaken at 3 locations plus inlet and outlet per sampling event, twelve times per year (two depths for TSS)						
	Water Quality						
a)	Total Suspended Solids, EC		120	per sample	15	$1,800	
b)	Total Nitrogen		60	per sample	31	$1,860	
c)	Total Phosphorus		60	per sample	31	$1,860	
d)	Chlorophyll A		60	per sample	28	$1,680	
e)	Enterococci		60	per sample	30	$1,800	Anticipated unit rates
f)	Faecal Coliforms		60	per sample	22	$1,337	
g)	Cyanobacteria ID and Enumeration		60	per sample	100	$6,000	
h)	Algae – Cyanobacteria Biovolume		60	per sample	26	$1,560	
	Sediment						
i)	Heavy Metals (cadmium, copper, Nickel, Lead, Zinc)		36	per sample	30	$1,080	
WQ4	**MAINTENANCE OF CONTINUOUS WATER QUALITY MONITORING PROBE AT INLET**						
a)	Monthly maintenance (as part of monitoring)		1	Personnel hours	150	$150	
b)	Replacement of probes (allowance)		2	Item	2500	$5,000	
c)	Replacement of monitor device every 5 years		0.20	Item	15000	$3,000	
WQ5	**RESULTS REVIEW & REPORTING**						
a)	Assumed one individual for a total of 1 hour per sampling event (twelve times per year)		12	Personnel hours	235	$2,820	
b)	Consolidated water quality monitoring report (six monthly)		24	Personnel hours	235	$5,640	
	TOTAL COST for WATER QUALITY MONITORING					**$95,467**	


5a
DC
MU
MU
MU
1
2
EMP 1
EMP 2
EMP 2
NC(SC)
NC(SE)
LEGEND
1:10,000 @ A1
MASTER PLAN
RIVERLEA
04 October 2013

S6

A DRAINS model was used to determine that a detention basin of the order of 250,000m^3 would be required to attenuate the 1 in 100 year ARI peak flows to a maximum outflow of 10m^3/s, with the critical duration storm the 90 minute event.

The location for the detention basin is indicatively shown in Figure 4.1 and was chosen for the following reasons:

- Lowest point on the site
- Low possibility of encountering acid sulphate soils
- Limited development potential of this area as the site elevations are low.

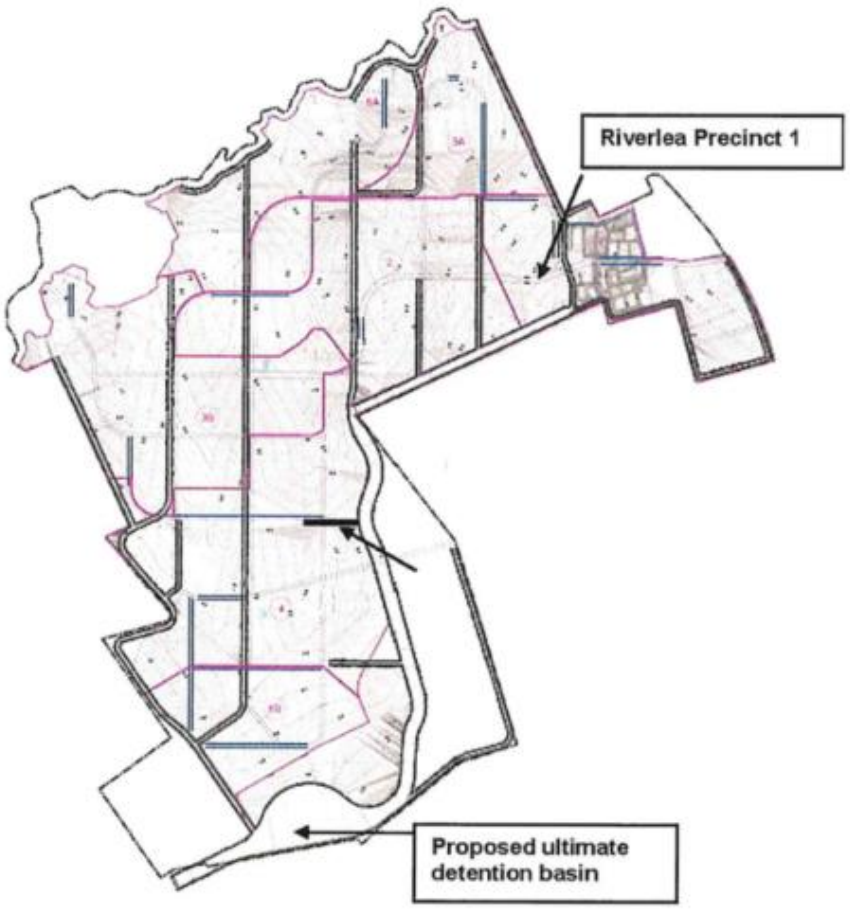


Figure 4.1 - *Proposed ultimate channel system*

Interim Solution

For the purpose of Precinct 1 incorporating Stage 1 & 2A, it is recommended that construction of the ultimate detention basin is not required, and an interim solution requiring a smaller proportion of channel construction is more appropriate. Figure 4.2 shows the proposed channel layout for Precinct 1, with the only segments to be constructed shown as Channels 1, 2 and 3.

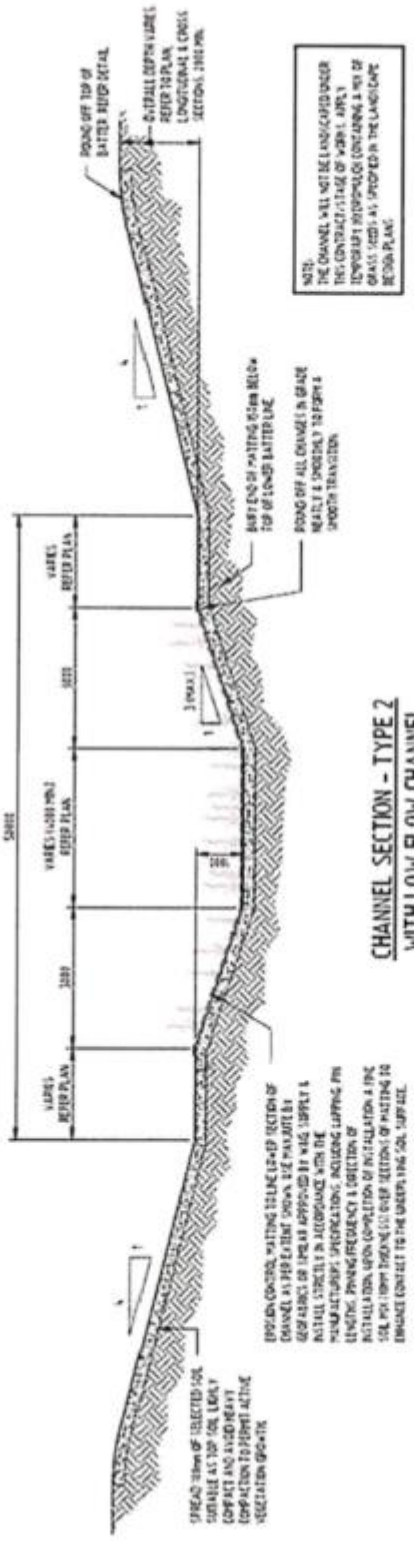
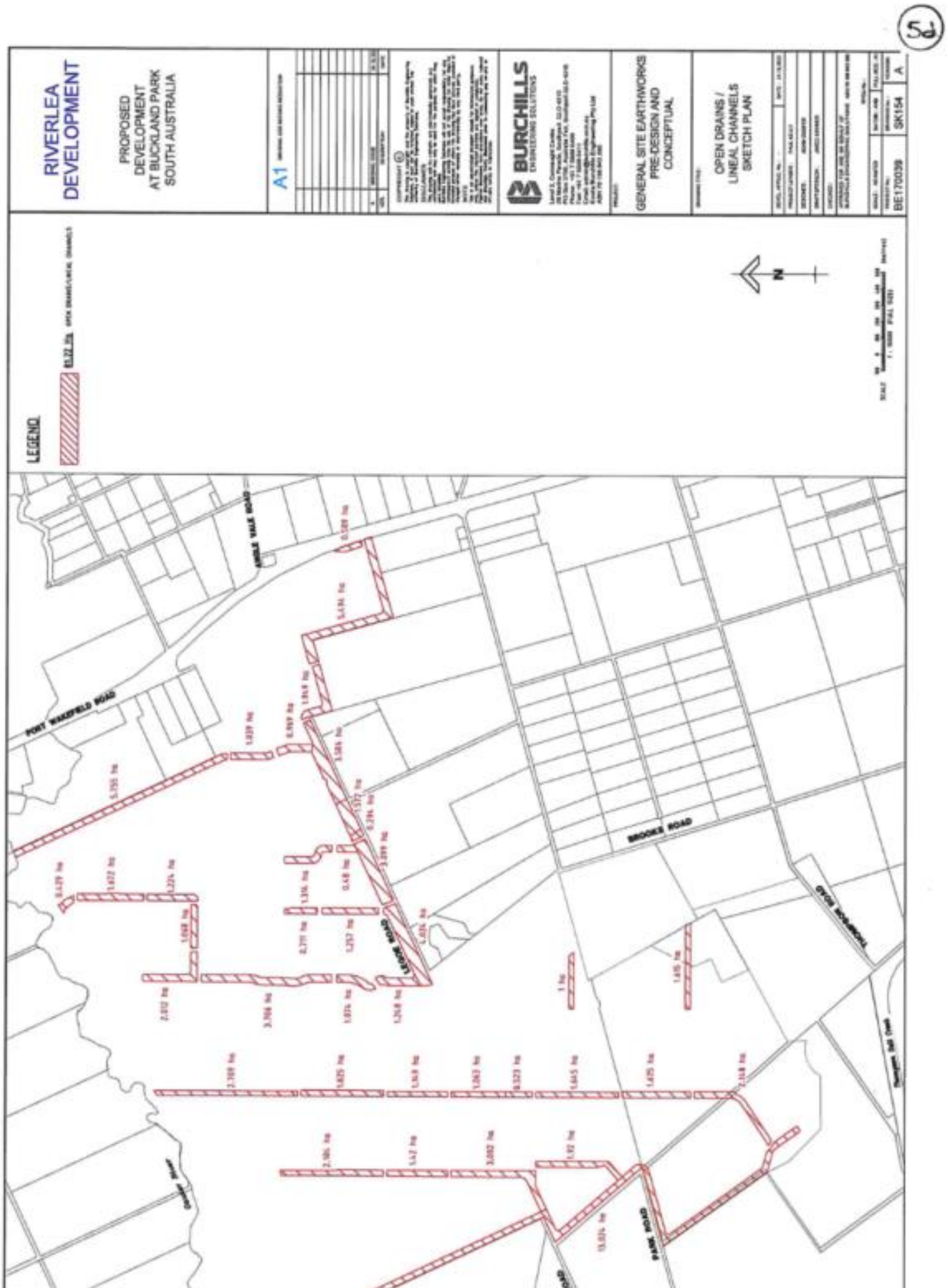
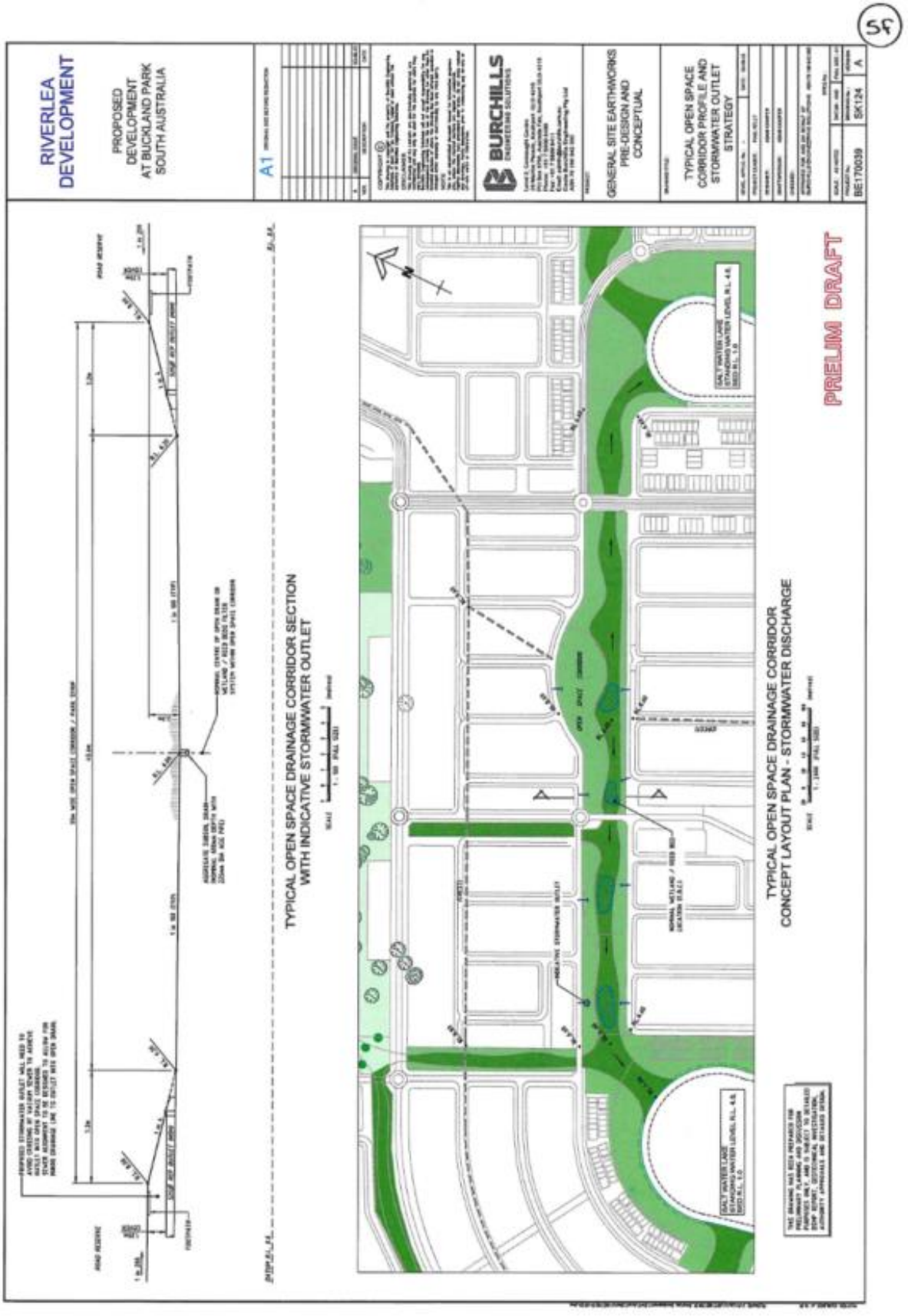
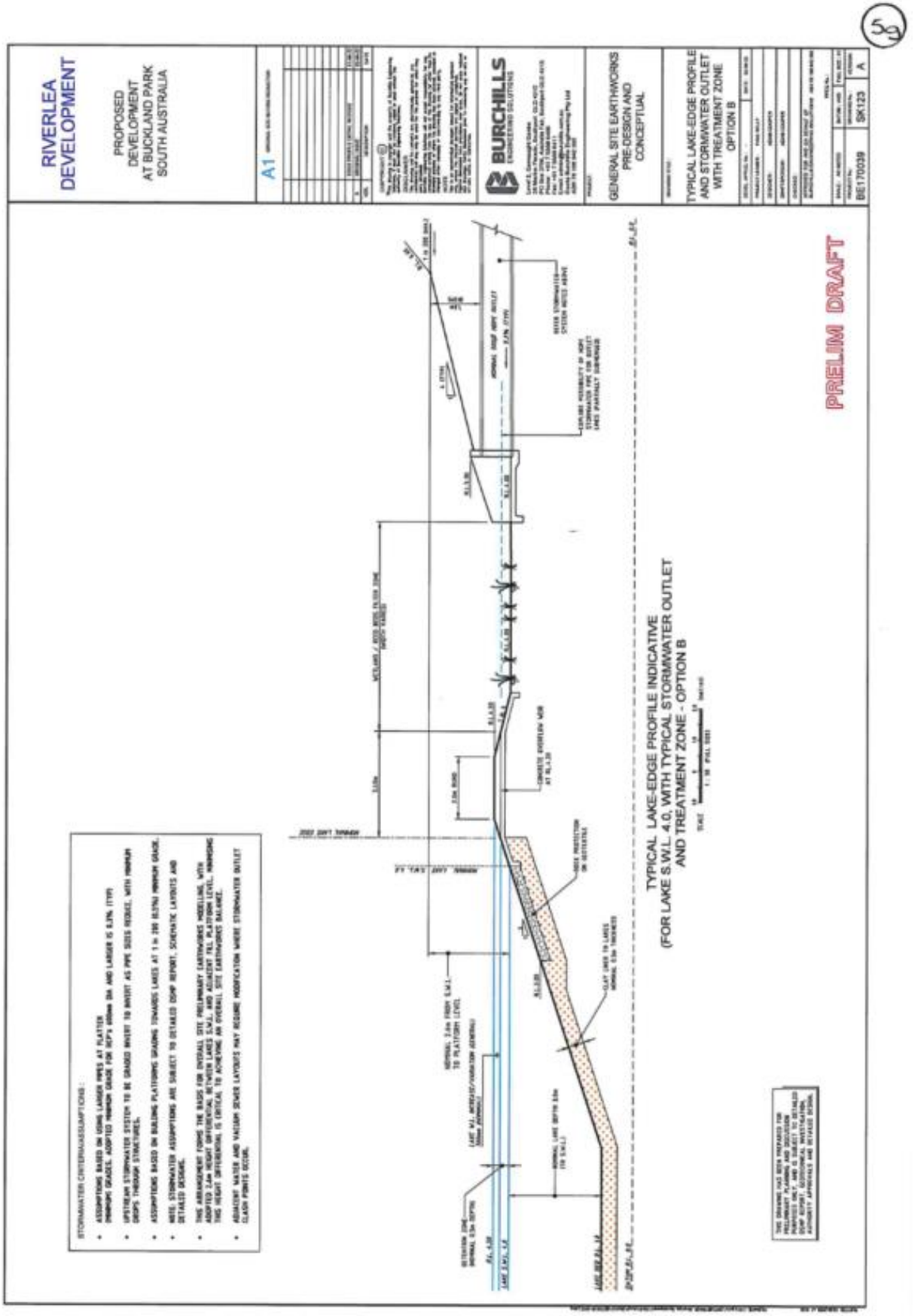


Figure 4.3 - *Typical channel dimensions downstream of Stage 1 & 2A*


5d
RIVERLEA DEVELOPMENT
PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA
A1
BURCHILLS
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL
OPEN DRAINS / LINEAL CHANNELS SKETCH PLAN
BE170039
SK154
A
LEGEND
N
PORT WAKEFIELD ROAD
BROOKS ROAD
LEGOE ROAD
PARK ROAD


5e
RIVERLEA DEVELOPMENT
PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA
A1
BURCHILLS
ENGINEERING SOLUTIONS
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL
DRAINAGE CHANNELS HIERARCHY PLAN
BE170039
SK149
B
LEGEND
PORT WAKEFIELD ROAD
LEGOE ROAD DRAIN
EASTERN BOUNDARY DRAIN
BROOKS ROAD
LEGOE ROAD
PARK ROAD
WESTERN BOUNDARY DRAIN
S.WL 1
S.WL 2
S.WL 3
EWS
N


RIVERLEA DEVELOPMENT
PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA
A1
BURCHILLS
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL
TYPICAL OPEN SPACE CORRIDOR PROFILE AND STORMWATER OUTLET STRATEGY
BE170039
SK124
A
TYPICAL OPEN SPACE DRAINAGE CORRIDOR SECTION WITH INDICATIVE STORMWATER OUTLET
TYPICAL OPEN SPACE DRAINAGE CORRIDOR CONCEPT LAYOUT PLAN - STORMWATER DISCHARGE
PRELIM DRAFT


RIVERLEA DEVELOPMENT
PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA
A1
BURCHILLS
ENGINEERING SOLUTIONS
GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL
TYPICAL LAKE-EDGE PROFILE AND STORMWATER OUTLET WITH TREATMENT ZONE OPTION B
BE170039
SK123
A
PRELIM DRAFT
TYPICAL LAKE-EDGE PROFILE INDICATIVE
(FOR LAKE S.W.L. 4.0, WITH TYPICAL STORMWATER OUTLET
AND TREATMENT ZONE - OPTION B

25. Appendix O – Hudson Howells Report

Riverlea

walker

SALT WATER LAKE SYSTEM

ECONOMIC & SOCIAL IMPACTS

Online Survey Report

November 2022

prepared by

hudson howells
strategic management consultants

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Introduction

In July 2022, Hudson Howells, in association with BDO EconSearch, was engaged by Walker Buckland Park Developments (Walker) to undertake a study to determine the impact the delivery of the salt water lake system for its Riverlea development project would have on the City of Playford.

The proposed salt water lake system is a key item of amenity for the project which will play a key role in stormwater management, visual amenity and recreational amenity.

The study examined the impact of the salt water lake system from two key perspectives:

1. The financial impact of the implemented system on the City of Playford as the ultimate owner and operator of the salt water lake system.
2. The social impact, in the form of a statistically robust survey, on the local and surrounding communities where the potential future residents of, and visitors to, Riverlea will be drawn from.

EXECUTIVE SUMMARY (Continued)

Financial Analysis Approach

BDO EconSearch has undertaken a financial analysis of the salt water lake system for Walker which will be used to seek endorsement from the City of Playford and will ultimately be used to seek full approval from Council to proceed with delivery of the salt water lake system.

The costs and benefits of the Lakes Option were measured using a 'with' and 'without' project framework, that is, quantification of the incremental changes associated with the Lakes Option (i.e. the salt water lake system) compared to the Base Case, from Council's perspective.

A description of the options is as follows:

Base case	3.5ha Freshwater lake and extensive network of floodways for stormwater and flood mitigation.
Lakes Option	40ha Salt water lake system with parkland links incorporating shallow overland flow pathways and minimal floodways for stormwater and flood mitigation which is expected to increase sales demand for residential and commercial properties relative to the base case as a result of higher amenity, wellness and wellbeing for residents.

EXECUTIVE SUMMARY (Continued)

Financial Analysis Results

In each year of the 25-year period costs to maintain the Base Case is expected to exceed the costs to operate and maintain the Lakes Option. This means that from a pure cost perspective, the Lakes Option is preferred to the Base Case and that the costs for Council to maintain the Base Case are greater than the costs to maintain the Lakes Option in every year of the analysis.

In addition, the increased sales demand from improved visual and recreational amenity under the Lakes Option is expected to bring forward the increase in general rate revenue compared to that which would be received under the open channel Base Case. The net present value (NPV) of $38.4m indicates that, relative to the Base Case, the Lakes Option is expected to generate a net benefit to Council of $38.4m over a 25-year period. The decision rule is that the investment is preferred to the Base Case if the NPV is greater than zero.

A NPV of $38.4m over the 25-year period of analysis represents an annual net benefit for Council of $1.5m. This annual benefit would increase the expected operating surplus for 2022/23 ($1.9m (City of Playford 2022b)). This benefit is presented in this report as a financial benefit to the Council but could be passed on to rate payers in the form of a lower rate in the dollar of capital value.

EXECUTIVE SUMMARY (Continued)

Financial Analysis Summary

In summary, the Lakes Option is preferred to the Base Case as a stormwater and flood mitigation solution. Not only will the Lakes Option cost less than the Base Case option to operate and maintain, it is expected to bring forward the increase in general rate revenue compared to that which would be received under the Base Case. This is a significantly positive benefit to council and will serve to underpin the 10,000 employment impact expected from the Riverlea project.

EXECUTIVE SUMMARY (Continued)

Social Impact Study Objective & Methodology

A primary objective of the overall study was to gain a rich understanding of the impact of the salt water lake system on the local and broader communities as the potential future residents of, and visitors to, Riverlea.

The methodology employed involved:

- Designing a questionnaire to be completed by the online survey respondents.
- Sourcing examples of the two stormwater and flood management system options for inclusion in the online survey questionnaire.
- Undertaking the fieldwork which consisted of two surveys using the same questionnaire:
- Riverlea registrations of interest database which resulted in n=342 responses.
- Online panel database drawn from postcodes within the defined catchment Riverlea project catchment area (surrounding communities) which resulted in n=350 responses.
- Collating, analysing and interpreting the survey responses (independently undertaken by Hudson Howells).

EXECUTIVE SUMMARY (Continued)

Social Impact Study Sample Size

- A total of 692 responses to the online survey were received.
- Respondents are extended across 83 postcodes in South Australia (refer to maps in the body of the report), with an additional 38 respondents from interstate.
- This sample size results in a confidence interval of plus or minus 3.72 at a 95% confidence level.
- The confidence interval (also called margin of error) is the plus-or-minus figure typically reported in newspaper or television opinion poll results. For example, if you use a confidence interval of 3.72 and 47% percent of your sample selects an answer you can be 'sure' that if you had asked the question of the entire relevant population between 43.3% (47-3.72) and 50.7% (47+3.72) would have selected that answer.
- The confidence level indicates how sure you can be. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level means you can be 95% certain. Researchers typically use a 95% confidence level.
- When you put the confidence level and the confidence interval together, you can say you are 95% sure that the true percentage of the population is between 43.3% and 50.7% (using the above example).

EXECUTIVE SUMMARY (Continued)

Social Impact Study Findings

The online survey findings demonstrated beyond doubt that the local and broader communities strongly prefer the Lake System option (93% preference) over the Channel System option (7% preference). In particular the Lake System open space option achieved:

- A 9.2/10 overall rating for making Riverlea an attractive place when the Lake System open space is completed.
- A 9.1/10 rating for making Riverlea a more attractive place to live in.
- A 9.1/10 rating for making Riverlea a more attractive place for people to visit.
- A 9.0/10 rating for making Riverlea a welcoming environment for people to socialise.
- A 9.2/10 rating for promoting a healthy lifestyle.
- An 8.5/10 rating for providing safe and secure access for all people.
- An 8.5/10 rating for filling a need in the area for a modern and attractive destination.
- A 9.1/10 rating for providing benefits in the form of places to relax and meet.
- An 8.9/10 rating for providing opportunities for festivals and events.
- A 9.1/10 rating for creating a sense of pride within the community.

EXECUTIVE SUMMARY (Continued)

Social Impact Study Conclusions

The online survey findings highlighted that the Lake System open space option is highly likely to influence recommendations to friends or family for Riverlea to be a place to visit, rating 9.2 out of a possible 10.

In conclusion the Lake System option in not only strongly preferred by the local and surrounding communities, it is also the catalyst for a series of highly favourable perceptions by future residents of, and visitors to, Riverlea.

When the research findings are overlayed on the financial analysis undertaken by BDO EconSearch, it is clear that the Lake System option is highly beneficial to Council and its constituents.

When the research findings are overlayed on the financial analysis undertaken by BDO EconSearch, it is clear that the Lake System option is highly beneficial to Council and its constituents.

INTRODUCTION

INTRODUCTION

In July 2022, Hudson Howells, in association with BDO EconSearch, was engaged by Walker Buckland Park Developments (Walker) to undertake a study to determine the impact the delivery of the salt water lake system for its Riverlea development project would have on the City of Playford.

The proposed salt water lake system is a key item of amenity for the project which will play a key role in stormwater management, visual amenity and recreational amenity.

The study examined the impact of the salt water lake system from two key perspectives:

1. The financial impact of the implemented system on the City of Playford as the ultimate owner and operator of the salt water lake system.
2. The social impact, in the form of a statistically robust survey, on the local and surrounding communities where the potential future residents of, and visitors to, Riverlea will be drawn from.

This report provides a summary of the financial analysis undertaken by BDO EconSearch with the full report provided as an appendix (Appendix 1 - Riverlea Salt Water Lake System Financial Analysis).

This report also details the findings of the online survey with a MS Excel workbook containing the full set of tables and charts provided as an appendix (Appendix 2 - Riverlea Salt Water Lake System Online Survey Tables & Charts).

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH

Introduction

BDO EconSearch has undertaken a financial analysis of the salt water lake system for Walker which will be used to seek endorsement from the City of Playford and will ultimately be used to seek full approval from Council to proceed with delivery of the salt water lake system.

Method

The costs and benefits of the Lakes Option were measured using a 'with' and 'without' project framework, that is, quantification of the incremental changes associated with the Lakes Option (i.e. the salt water lake system) compared to the Base Case, from Council's perspective.

A description of the options is as follows:

Base case	3.5ha Freshwater lake and extensive network of floodways for stormwater and flood mitigation.
Lakes Option	40ha Salt water lake system with parkland links incorporating shallow overland flow pathways and minimal floodways for stormwater and flood mitigation which is expected to increase sales demand for residential and commercial properties relative to the base case as a result of higher amenity, wellness and wellbeing for residents.

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH (Continued)

The evaluation criterion employed for this analysis was Net Present Value (NPV), which is the discounted option benefits less discounted option costs, measured in Dollars and relative to the Base Case. Under this decision rule the option is considered to be potentially viable if the NPV is greater than zero.

Assumptions

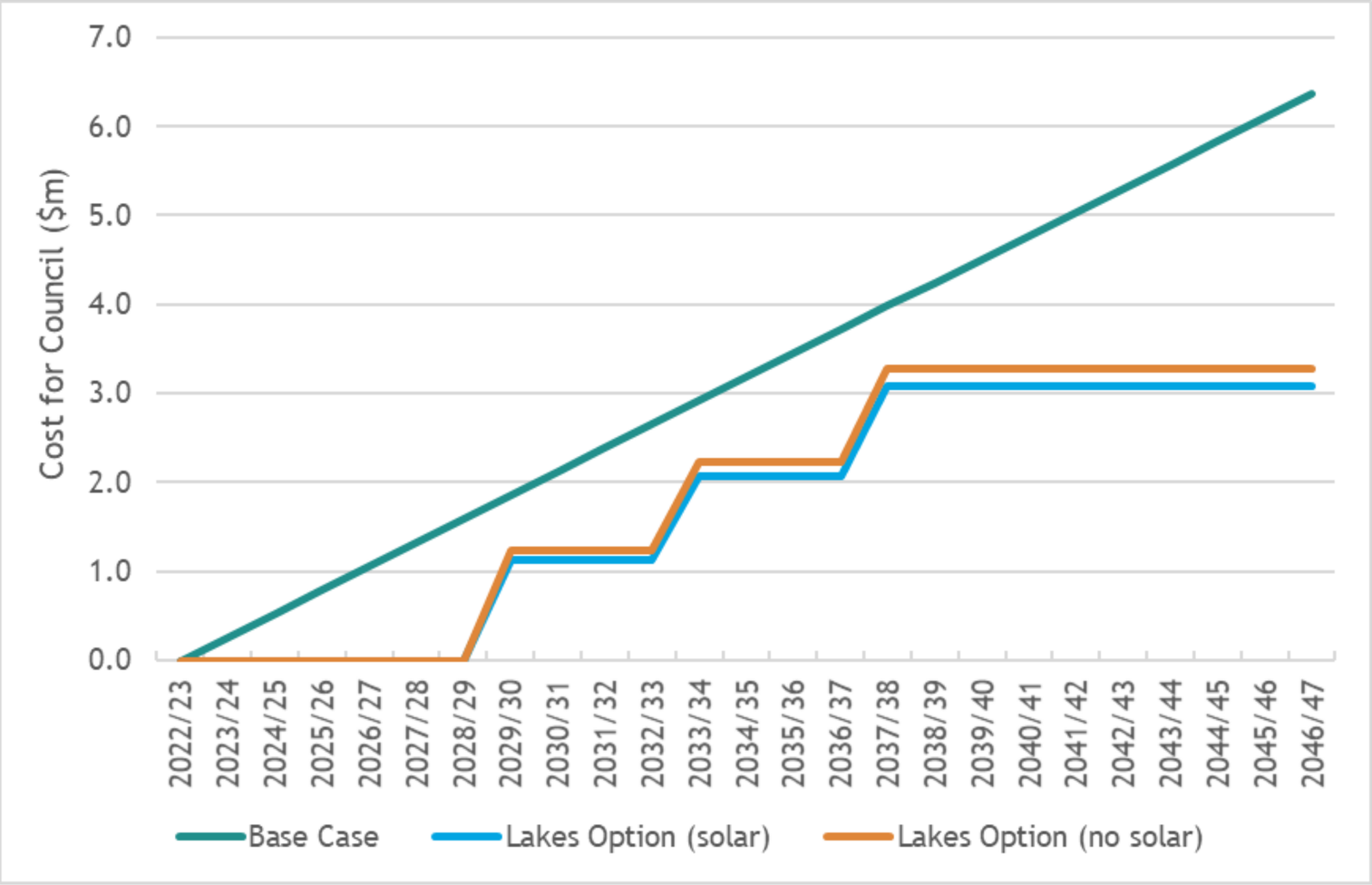
The schedule of costs which Council would be required to fund under the Base Case and the Lakes Option is shown in Figure ES 1 on the following page. The annual cost for maintenance of the Base Case was based on October 2022 tendered rates for landscape maintenance works at Riverlea. Walker expects to progressively pass on the costs to Council over the 25-year period so the full annual cost ($6.37m) is passed on to Council in year 25 (2046/47). Costs would include system, water body and edge maintenance.

The annual cost for operation and maintenance of the Lakes Option was also based on October 2022 tendered rates for landscape maintenance works at Riverlea. The three phases of the lake system construction will be staged over approximately a 15-year period, meaning the earlier phases would operate independently until the latter phases are constructed and become operational. After five years from practical completion of each phase, and upon rectification of any known salt water lake system defects (except wear and tear), Council would assume the operation and maintenance of the system from Walker Corporation. Total cost for operating and maintenance of the system will be handed over to Council in year 16 (2037/38) at $3.08m.

.

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH (Continued)

Figure ES 1 Schedule of annual costs for the Base Case and Lakes Option



Riverlea

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH (Continued)

General rate revenue estimated under the Base Case and Lakes Option will add significantly to the current rate revenue received by Council. As described by Council *"Money raised through rates assists Council to provide the Playford community with a wide range of services. These include existing ongoing, core services such as keeping our streets clean, rubbish removal, running immunisation clinics, operating libraries and community programs, as well as renewing, replacing and building new assets such as footpaths, roads and sporting grounds"* (City of Playford 2022). General rate revenue expected is expected to be $74.7m in 2022/23 (City of Playford 2022).

Under the Lakes Option general rate revenue is expected to stabilise in year 21 (2042/43) at $32.2m when it is estimated the 12,000 homes will have been sold. This amount would significantly increase the general rate revenue expected for 2022/23.

Under the Base Case general rate revenue is not expected to stabilise during the 25-year period of analysis as a result of the anticipated 12,000 total homes not being reached under the assumed sales demand schedule. In this case general rate revenue from the development would reach $28.2m in year 25 (2046/47).

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH (Continued)

Results

Table ES 1 on the following page shows the results of the financial analysis in present value term. In each year of the 25-year period costs to maintain the Base Case is expected to exceed the costs to operate and maintain the Lakes Option. This means that from a pure cost perspective, the Lakes Option is preferred to the Base Case and that the costs for Council to maintain the Base Case are greater than the costs to maintain the Lakes Option in every year of the analysis.

In addition, the increased sales demand from improved visual and recreational amenity under the Lakes Option is expected to bring forward the increase in general rate revenue compared to that which would be received under the open channel Base Case. The net present value (NPV) of $38.4m indicates that, relative to the Base Case, the Lakes Option is expected to generate a net benefit to Council of $38.4m over a 25-year period. The decision rule is that the investment is preferred to the Base Case if the NPV is greater than zero.

A NPV of $38.4m over the 25-year period of analysis represents an annual net benefit for Council of $1.5m. This annual benefit would increase the expected operating surplus for 2022/23 ($1.9m (City of Playford 2022b)). This benefit is presented in this report as a financial benefit to the Council but could be passed on to rate payers in the form of a lower rate in the dollar of capital value.

A sensitivity analysis found that the NPV for the Lakes Option remains positive over a reasonable range of assumed values for key variables in the analysis.

SUMMARY OF FINANCIAL ANALYSIS UNDERTAKEN BY BDO ECONSEARCH (Continued)

Table ES 1 Present value of result of the financial analysis ($m)

	Expected Council Benefit		
	No lakes	With lakes	Net benefit of lakes
Rate income	147.46	198.96	51.50
Residual capital value	0.00	2.35	2.35
Provision of Council Services	-147.46	-178.69	-31.23
Capital replacement costs	0.00	-0.06	-0.06
Maintenance costs	-32.60	-16.77	15.84
Total	**-32.60**	**5.80**	**38.40**

Source: BDO EconSearch analysis

In summary, the Lakes Option is preferred to the Base Case as a stormwater and flood mitigation solution. Not only will the Lakes Option cost less than the Base Case option to operate and maintain, it is expected to bring forward the increase in general rate revenue compared to that which would be received under the Base Case. This is a significantly positive benefit to council and will serve to underpin the 10,000 employment impact expected from the Riverlea project.

Riverlea

RESEARCH METHODOLOGY

RESEARCH DESIGN

A primary objective of the overall study was to gain a rich understanding of the impact of the salt water lake system on the local and broader communities as the potential future residents of, and visitors to, Riverlea.

Research methodologies such as focus groups and depth interviews were discussed, but it was concluded that the evidence base for decision making should be the result of an empirical study using a quantitative approach.

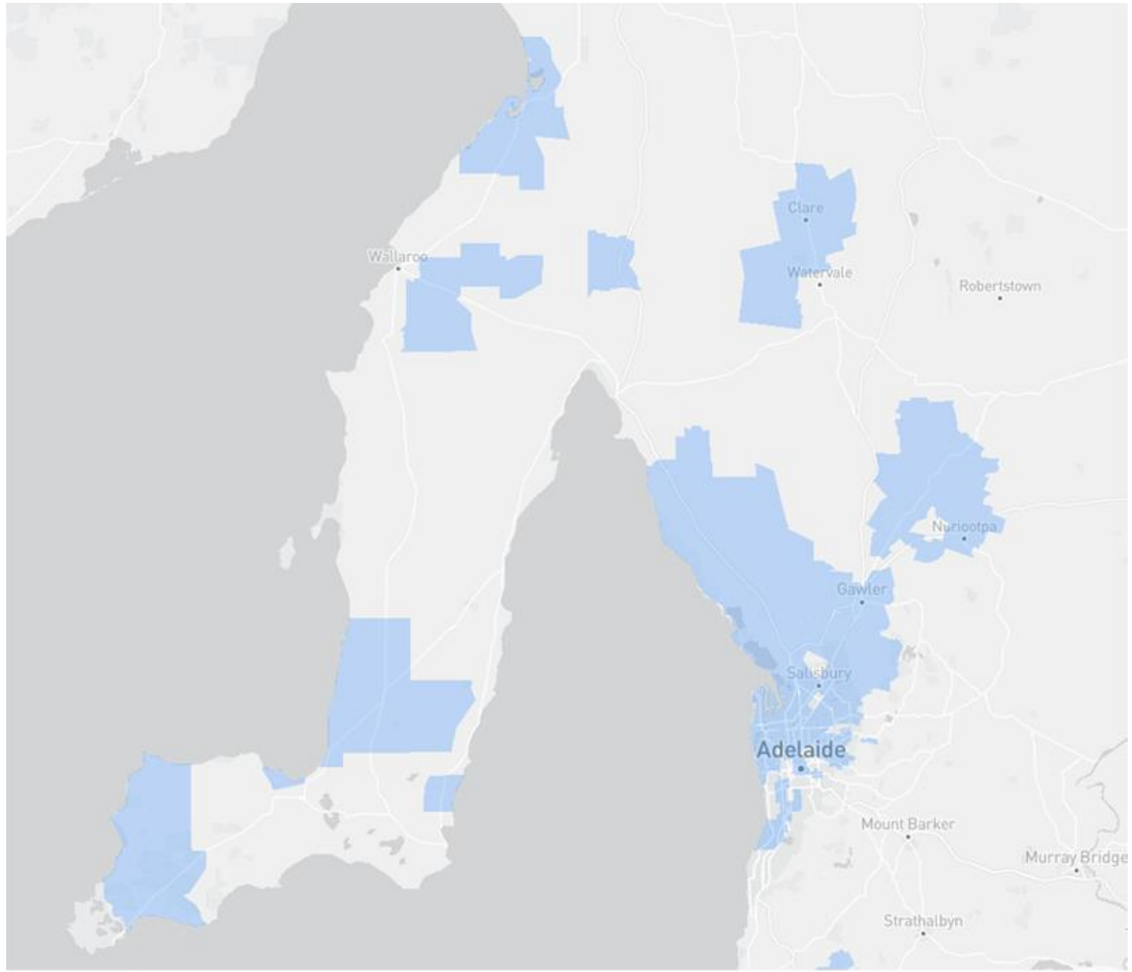
The methodology employed involved:

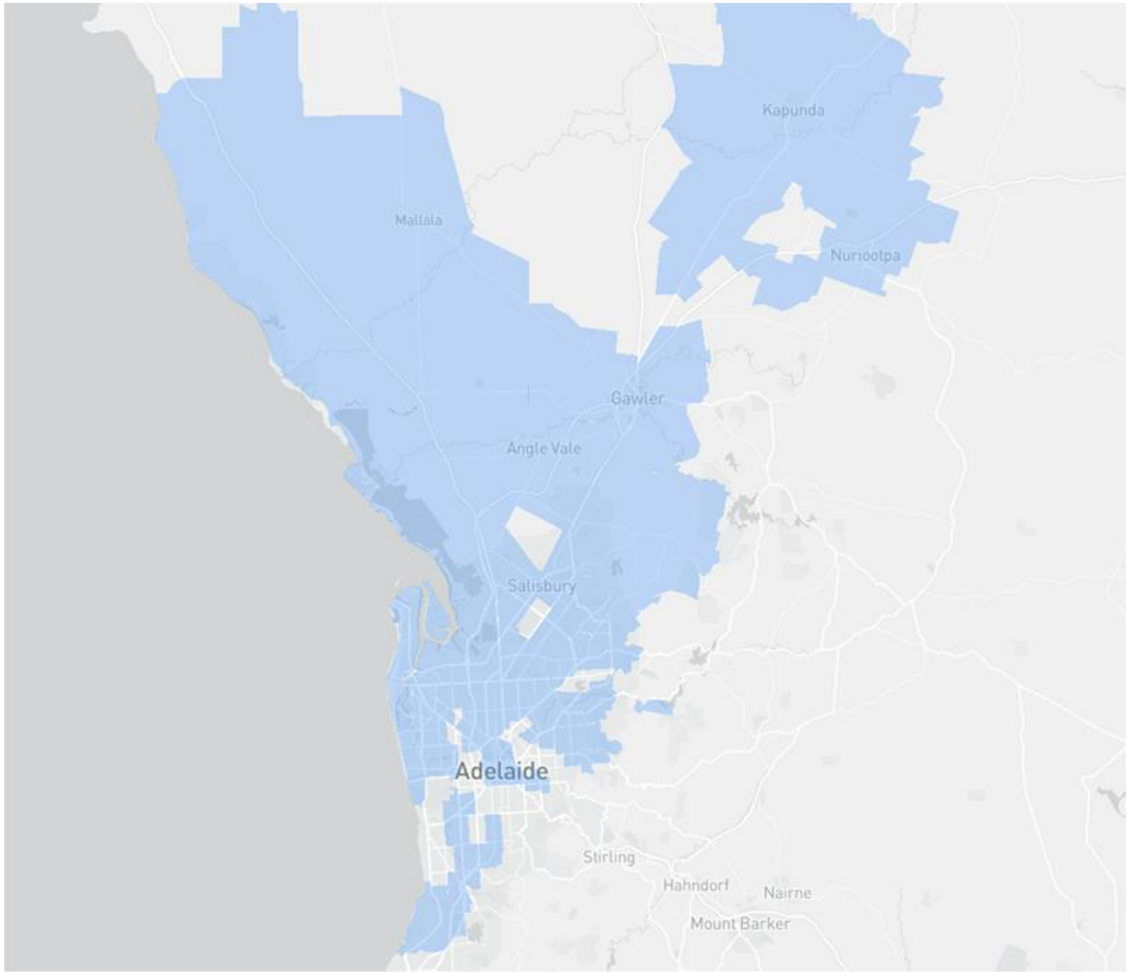
- Designing a questionnaire to be completed by the online survey respondents.
- Sourcing examples of the two stormwater and flood management system options for inclusion in the online survey questionnaire.
- Undertaking the fieldwork which consisted of two surveys using the same questionnaire:
  - Riverlea registrations of interest database which resulted in n=342 responses.
  - Online panel database drawn from postcodes within the defined catchment Riverlea project catchment area (surrounding communities) which resulted in n=350 responses.
- Collating, analysing and interpreting the survey responses (independently undertaken by Hudson Howells).

RESEARCH SAMPLE SIZE

- A total of 692 responses to the online survey were received.
- Respondents are extended across 83 postcodes in South Australia (refer to maps on the following slide), with an additional 38 respondents from interstate.
- This sample size results in a confidence interval of plus or minus 3.72 at a 95% confidence level.
- The confidence interval (also called margin of error) is the plus-or-minus figure typically reported in newspaper or television opinion poll results. For example, if you use a confidence interval of 3.72 and 47% percent of your sample selects an answer you can be ‘sure’ that if you had asked the question of the entire relevant population between 43.3% (47-3.72) and 50.7% (47+3.72) would have selected that answer.
- The confidence level indicates how sure you can be. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level means you can be 95% certain. Researchers typically use a 95% confidence level.
- When you put the confidence level and the confidence interval together, you can say you are 95% sure that the true percentage of the population is between 43.3% and 50.7% (using the above example).

RESPONDENT POSTCODES





Riverlea

RESEARCH QUESTIONNAIRE

The survey respondents were provided with an introduction to the questionnaire and then presented with two landscape option image sets:

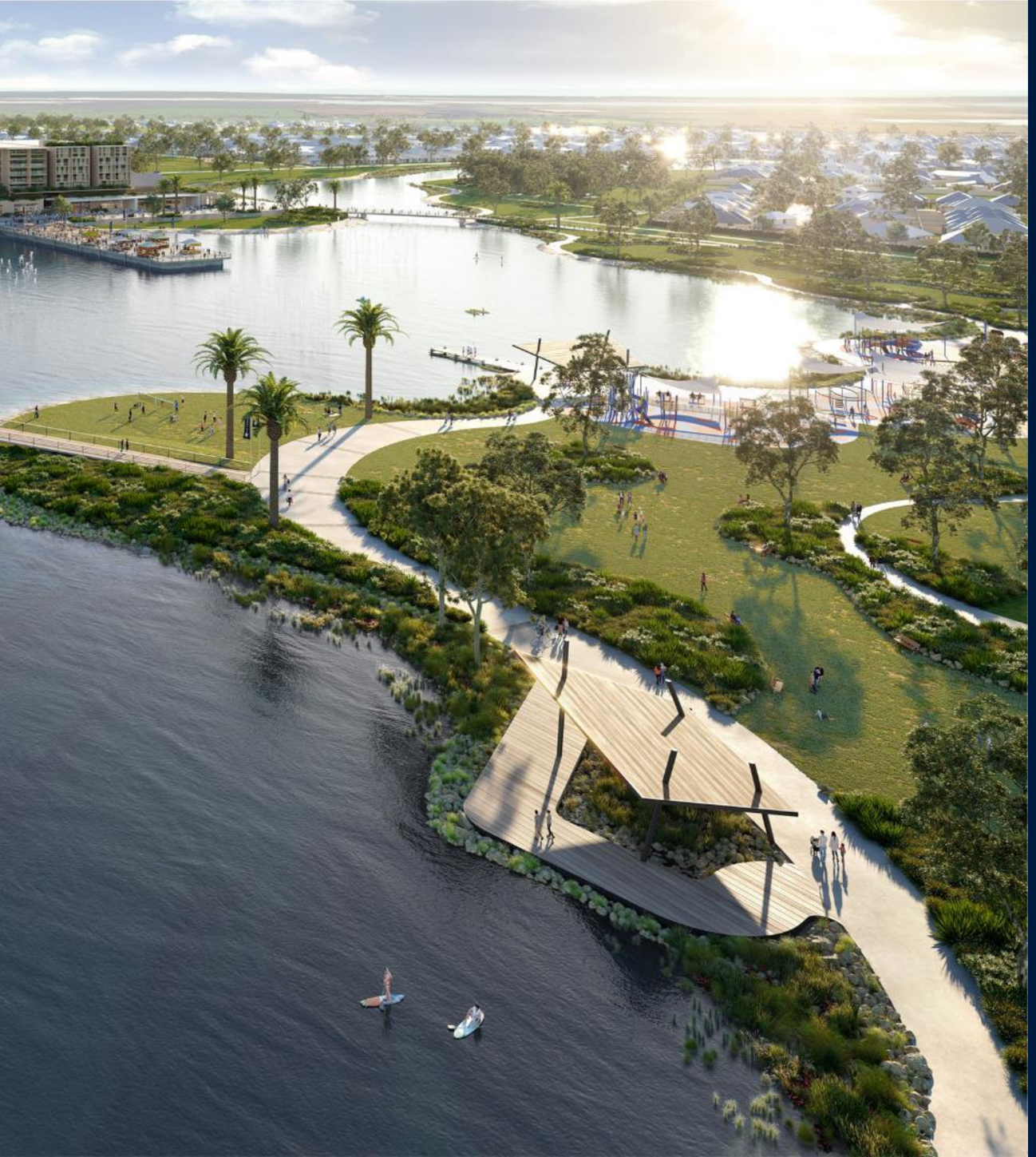
Image set A (channel images)

Image set B (lakes images)

Riverlea

RESEARCH QUESTIONNAIRE (Continued)

- The survey respondents were then asked which set of images they preferred – Image set A or Image set B (respondents were also given the opportunity to state they didn't like either of the image sets).
- Subsequent questions were then based on the Image set preferred by the respondent.
- The following research findings are based on the respondents' preferences.

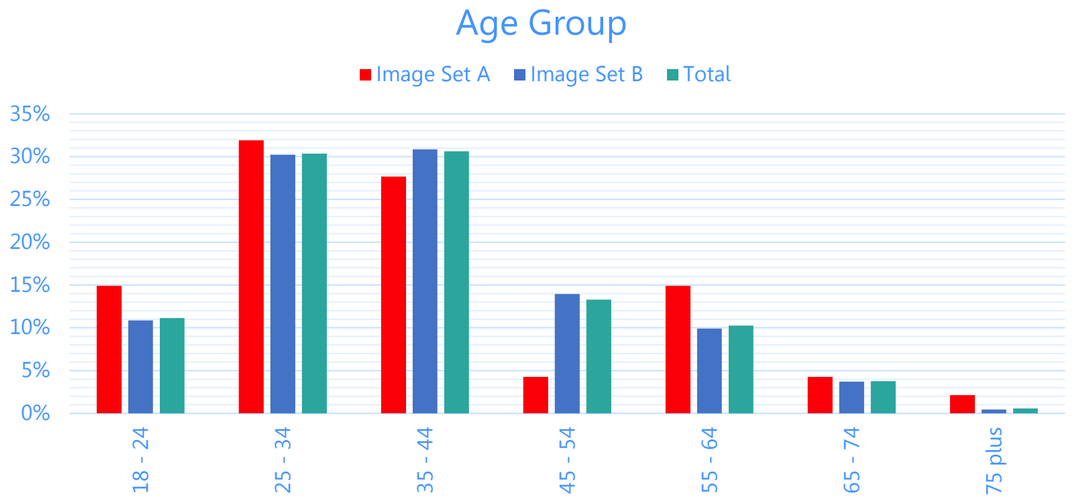


RESEARCH FINDINGS

RESPONDENT DEMOGRAPHICS

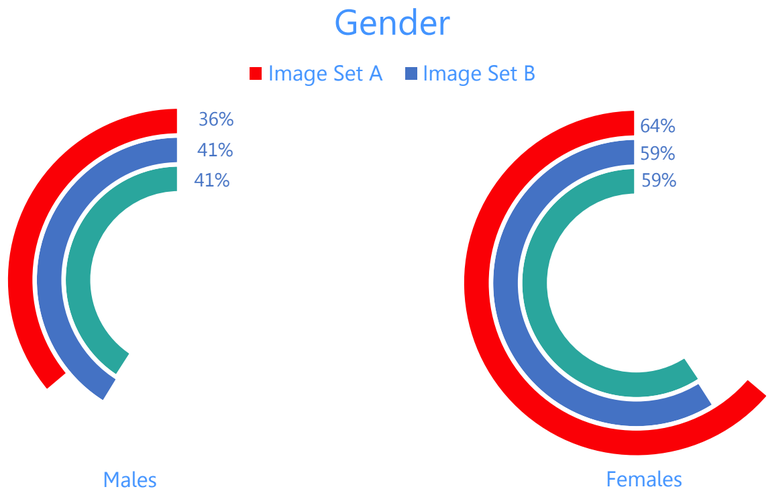
AGE GROUP

- Over half of total respondents are aged 25-44 years (61%)
- Respondents who prefer Image Set A are slightly younger compared to those preferring Image Set B (average 27 years and 28 years respectively)



GENDER

- More than half of total respondents are female (59%)
- There are more females in those respondents who prefer Image Set A (64%) when compared to those that prefer Image Set B (59%)

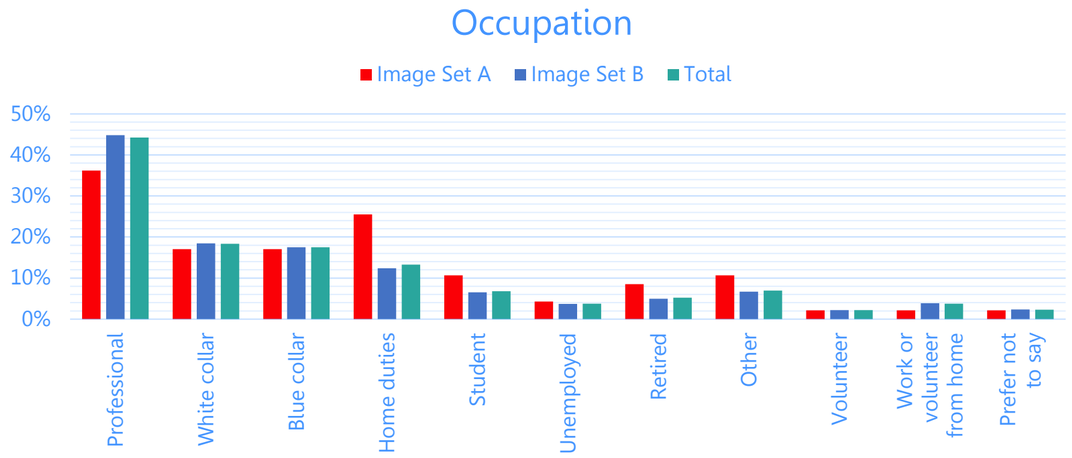


Riverlea

RESPONDENT DEMOGRAPHICS (Continued)

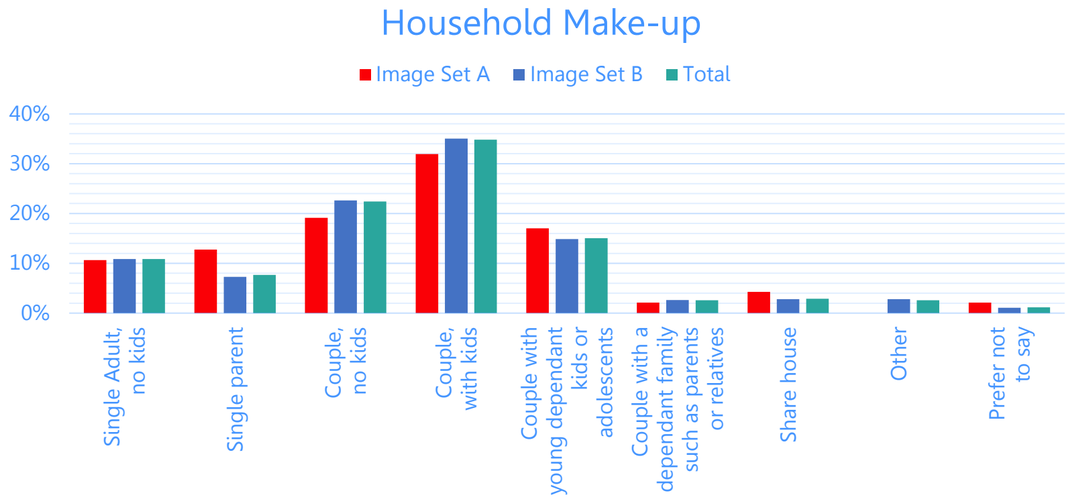
OCCUPATION

- Nearly half of total respondents work in professional occupations (44%)
- Respondents who prefer Image Set A are more likely to do house duties or are retired (26% and 9% respectively)



GENDER

- Three quarters of total respondents are couple households (75%)
- Respondents who prefer Image Set B are more likely to be couples with young children or no children (35% and 23% respectively)

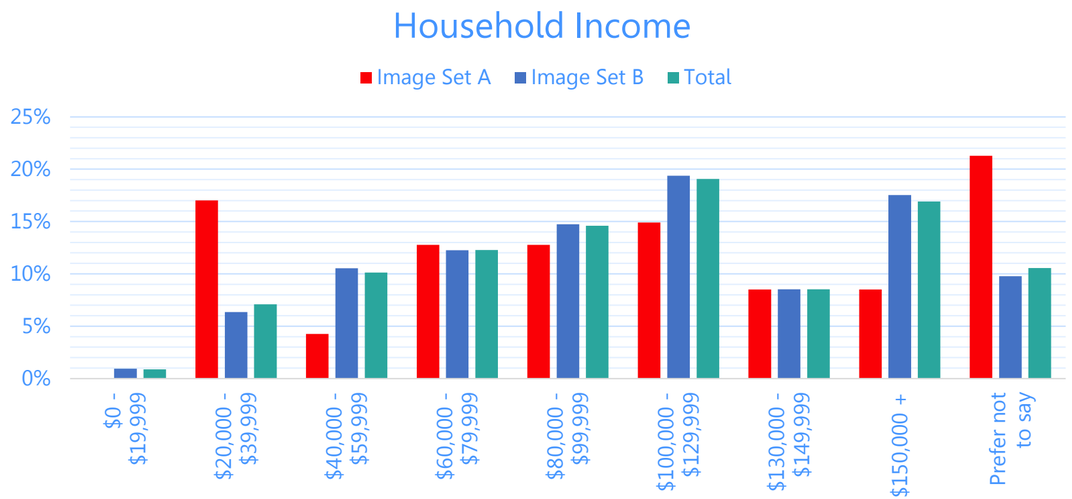


Riverlea

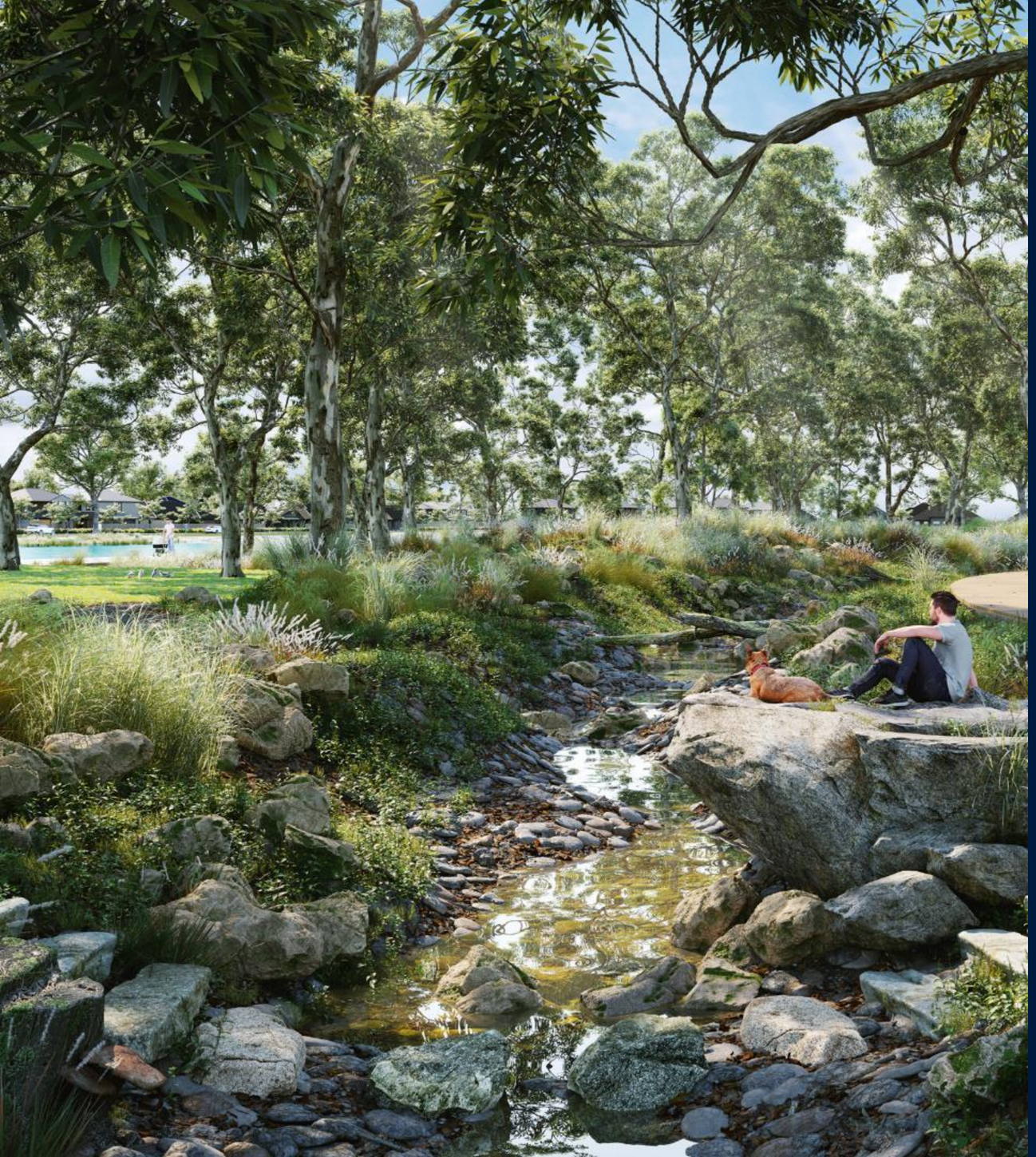
RESPONDENT DEMOGRAPHICS (Continued)

HOUSEHOLD INCOME

- Nearly half of total respondents have an annual household income between $60,000 and $130,000 (46%)
- Respondents who prefer Image Set B are more likely to have a higher household income



Riverlea



LANDSCAPE OPTION PREFERENCES

LANDSCAPE OPTION PREFERENCES

IMAGE SET A OR IMAGE SET B

- Nearly all respondents (93%) prefer Image Set B (lakes images) compared to Image Set A (channel images) (7%)

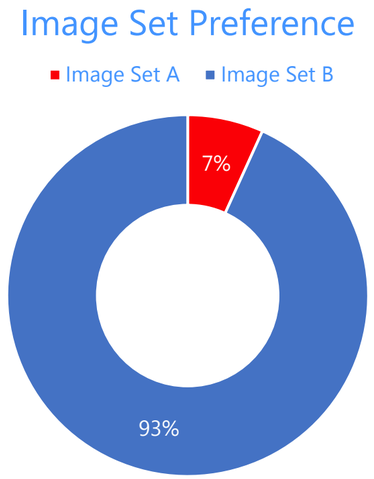


Image set A - channel image 1

Image set A - channel image 2

Image set B - lakes image 1

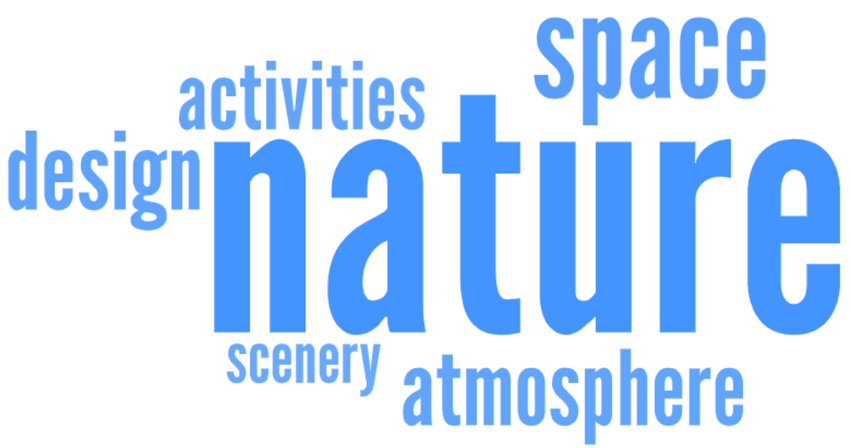
Image set B - lakes image 2

Riverlea

IMAGE SET A
MOST LIKED ABOUT CHANNEL SYSTEM

IMAGE SET A – LIKE MOST ABOUT CHANNEL SYSTEM

- Nature and green spaces is the most liked feature of the open channel system for those respondents who preferred Image Set A (62%)
- Image Set A respondents also noted the channel system was family friendly and good for the community (13%)



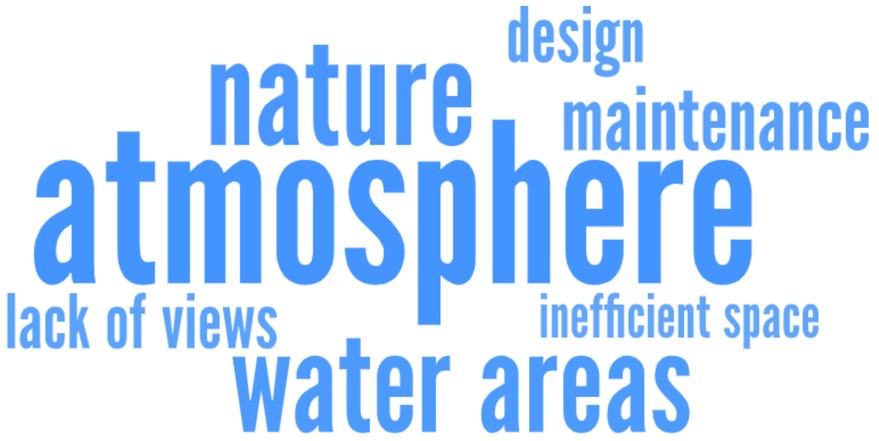
- It looks more natural
- I like that it is a more natural setting with trees
- It looks more natural
- Looks more natural and homely
- Feels more homely and green
- Looks quieter
- It's great and I know it will look more great if its conserved and maintained
- It looks 'more homey', and more like a place you raise children in. Image set A looks more green and natural

Riverlea

IMAGE SET A
LEAST LIKED ABOUT LAKE SYSTEM

IMAGE SET A – LIKE LEAST ABOUT LAKE SYSTEM

- The water and the atmosphere are the most disliked features of the lake system for those respondents who preferred Image Set A (23%)
- Image Set A respondents also noted the lack of greenery in the lake system (11%)



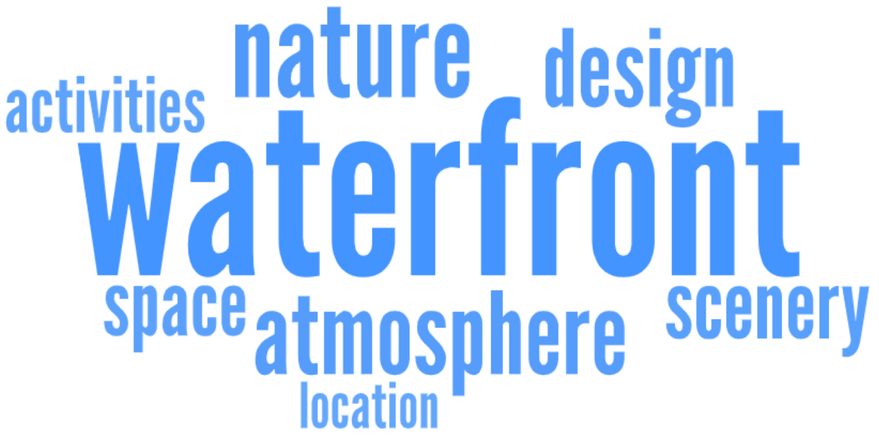
- Waterways attract way too many mosquitoes especially out north
- Looks artificial
- Too modern and like you have to be a certain type of wealthy family to be able to live there
- A hazard for children and can't really explore the environment
- Looks nice as a town centre but not for my residential street
- Misleading, developed land giving ambiguity of green space
- Expensive infrastructure not needed
- Looks too fake, not inviting or family friendly

Riverlea

IMAGE SET B
MOST LIKED ABOUT LAKE SYSTEM

IMAGE SET B - LIKE MOST ABOUT LAKE SYSTEM

- The bridge and waterfront location is the most liked feature of the lake system for those respondents who preferred Image Set B (40%)
- Image Set B respondents also noted the atmosphere and design of the lakes (23% and 21% respectively)

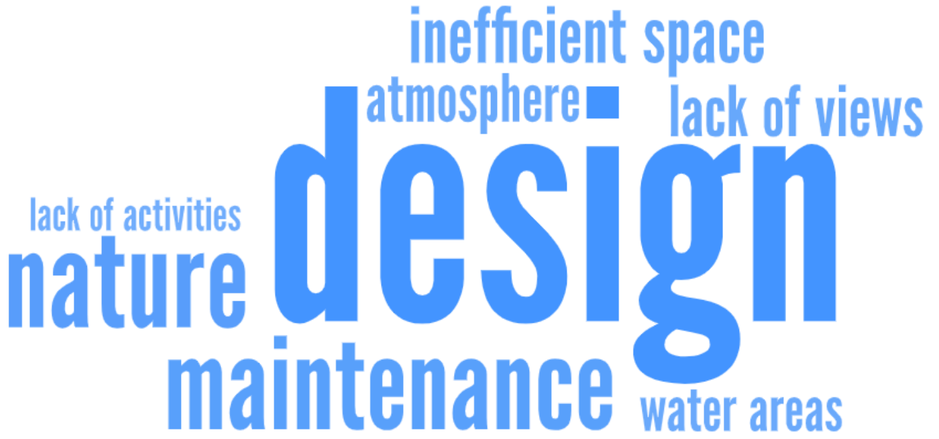


- Everything about image set B says peace and tranquility and just the perfect location to escape and call home
- The sophistication and relaxing vibe
- Modern and exquisite
- I love the water aspect, which is a main reason why I have bought my block in Riverlea
- Looks calm and tranquil
- Looks pleasant to the eye
- Clean modern futuristic design
- Greenery combined with pockets of water

IMAGE SET B
LEAST LIKED ABOUT CHANNEL SYSTEM

IMAGE SET B - LIKE LEAST ABOUT CHANNEL SYSTEM

- The design of the channel system is the most disliked feature for those respondents who preferred Image Set B (34%)
- Image Set B respondents also noted the safety and maintenance of the channel system may be an issue (24%)



- Waste of space not being used to what its potential is
- I feel it is a bit outdated and not very modern
- Looks boring and old
- Does not appear welcoming and nature areas don't seem practical or can be enjoyed
- Untidy looking
- It has a dull quality to it
- Looks messy and unkept
- I know the area where photos look like. They have swiftly become lower economic areas purchased by investors not owner occupiers.

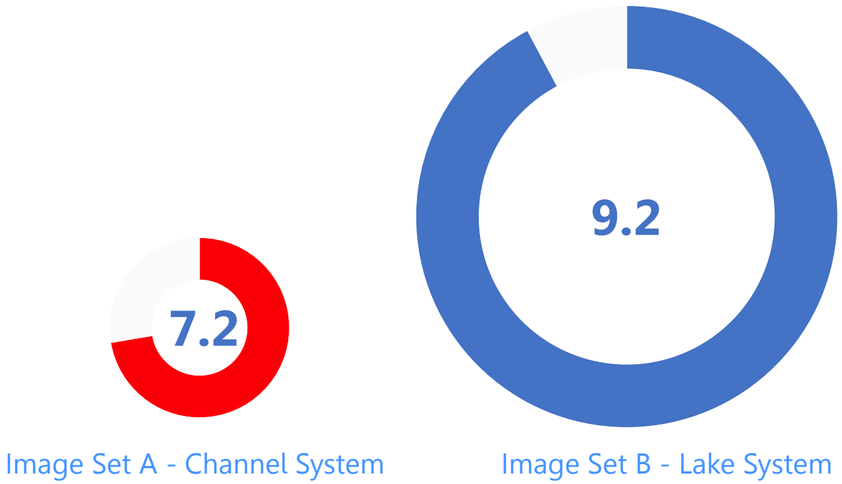
Riverlea

ATTRACTIVENESS OF SYSTEM OPTIONS A & B

ATTRACTIVENESS

On a scale of 1 to 10:

- Image Set A respondents gave an average rating of 7.2/10 with 83% rating the channel system an attractive place to visit (6-10 score)
- Image Set B respondents gave an average rating of 9.2/10 with 99% rating the lake system an attractive place to visit (6-10 score)
- Image Set B (lake system) is rated as more attractive by those respondents who prefer Image Set B compared to those respondents who prefer Image Set A (channel system)



Riverlea

IMAGE SET A
BENEFITS OF SYSTEM FOR RESIDENTS AND VISITORS

BENEFITS OF A CHANNEL SYSTEM

- The open space of the channel system is the biggest benefit of the channel system for over half of Image Set A respondents (57% for residents and 38% for visitors)
- The system looks like it would encourage people to get outside and is a relaxing environment (19% for residents)

- Wide roads and well-presented trees and grass calms you down and makes you feel connected with nature
    - It will be spacious with easy walking areas
- Welcoming, calming and a great place to explore
    - It makes the suburbs more inviting to guests

for residents:

for visitors:

Riverlea

IMAGE SET B
BENEFITS OF SYSTEM FOR RESIDENTS AND VISITORS

BENEFITS OF A LAKE SYSTEM

- Over half of Image Set B respondents think the lake system would encourage people to relax outside (51%)
- The open space and a relaxing environment (30% and 24% respectively)
- Visitors to the area would benefit from the open space and the atmosphere (27%)

- Lifestyle and affordability perfect for families
- Plenty of space, new infrastructure, good social life, get dream house without breaking the bank
- A great place to meet people and looks inviting
- Walking paths, open space, relaxing vibe, not that far from the CBD - day trips

for residents:

for visitors:

Riverlea

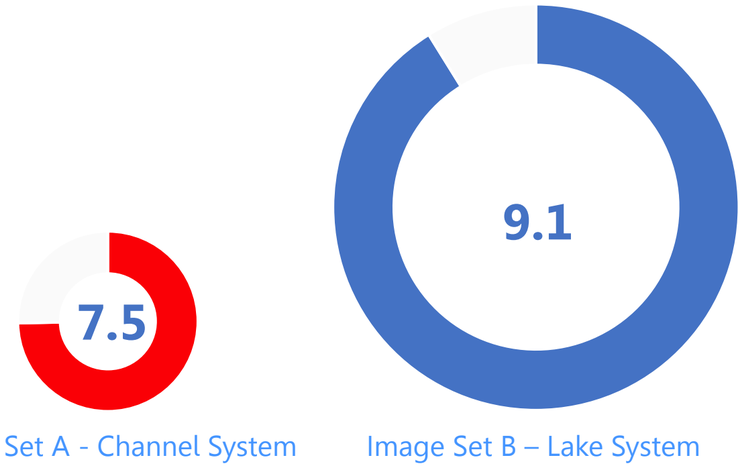
FEATURE INCLUSIONS

ATTRACTIVE PLACE TO LIVE AND FOR PEOPLE TO VISIT

OPEN SPACE WILL MAKE RIVERLEA A MORE ATTRACTIVE PLACE TO LIVE IN

To a large extent (rated 8-10):

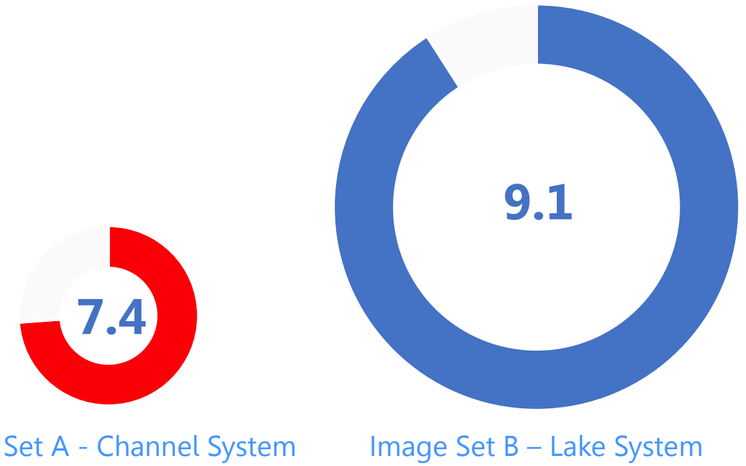
- Image Set A: 51% - mean score 7.5/10
- Image Set B: 89% - mean score 9.1/10



OPEN SPACE WILL MAKE RIVERLEA MORE ATTRACTIVE FOR PEOPLE TO VISIT

To a large extent (rated 8-10):

- Image Set A: 47% - mean score 7.4/10
- Image Set B: 88% - mean score 9.1/10



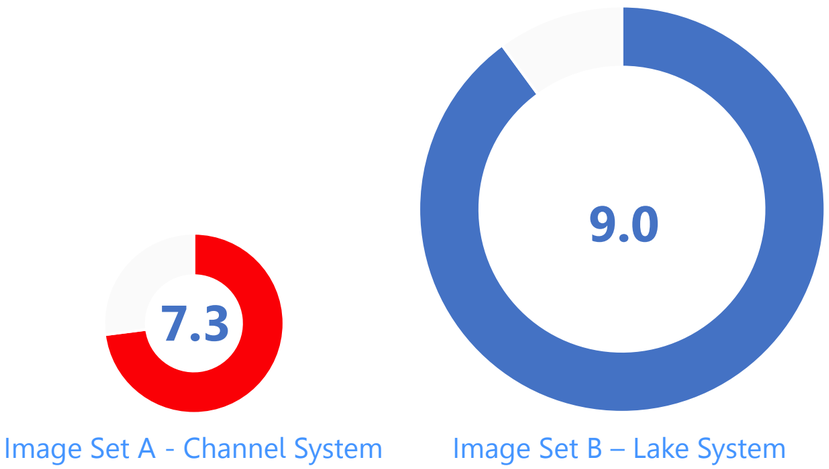
Riverlea

WELCOMING ENVIRONMENT AND A HEALTHY LIFESTYLE

OPEN SPACE WILL BE A WELCOMING ENVIRONMENT FOR PEOPLE TO SOCIALISE

To a large extent (rated 8-10):

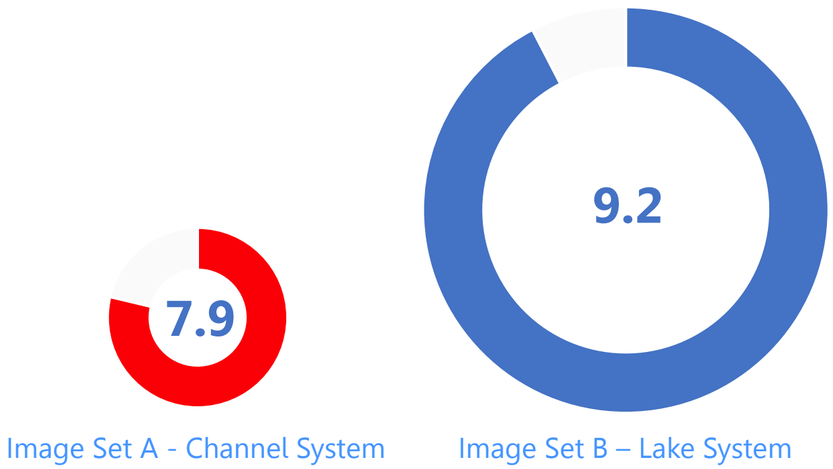
- Image Set A: 47% - mean score 7.3/10
- Image Set B: 86% - mean score 9.0/10



OPEN SPACE WILL PROMOTE A HEALTHY LIFESTYLE

To a large extent (rated 8-10):

- Image Set A: 57% - mean score 7.9/10
- Image Set B: 91% - mean score 9.2/10



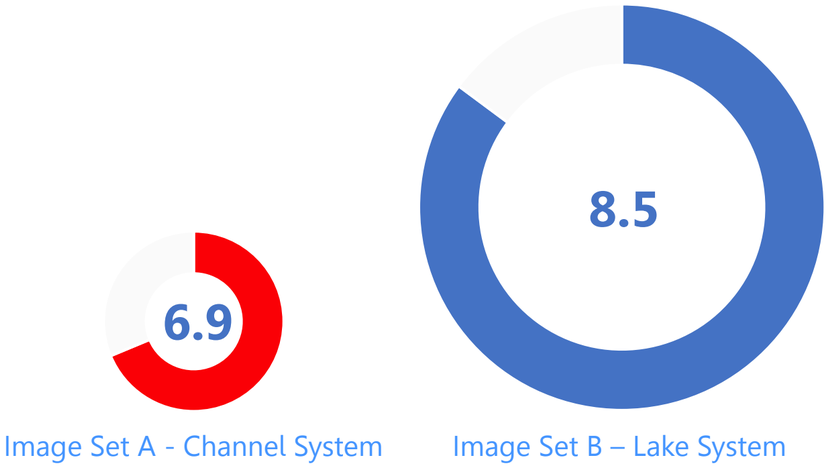
Riverlea

SAFE AND SECURE IN A MODERN AND ATTRACTIVE OPEN SPACE

OPEN SPACE WILL PROVIDE SAFE AND SECURE ACCESS FOR ALL PEOPLE

To a large extent (rated 8-10):

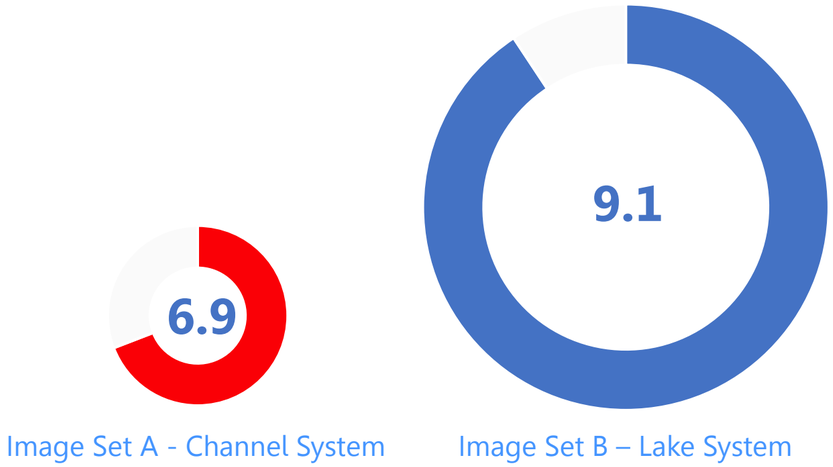
- Image Set A: 40% - mean score 6.9/10
- Image Set B: 76% - mean score 8.5/10



OPEN SPACE WILL FILL A NEED IN THE AREA FOR A MODERN & ATTRACTIVE DESTINATION

To a large extent (rated 8-10):

- Image Set A: 38% - mean score 6.9/10
- Image Set B: 87% - mean score 8.5/10



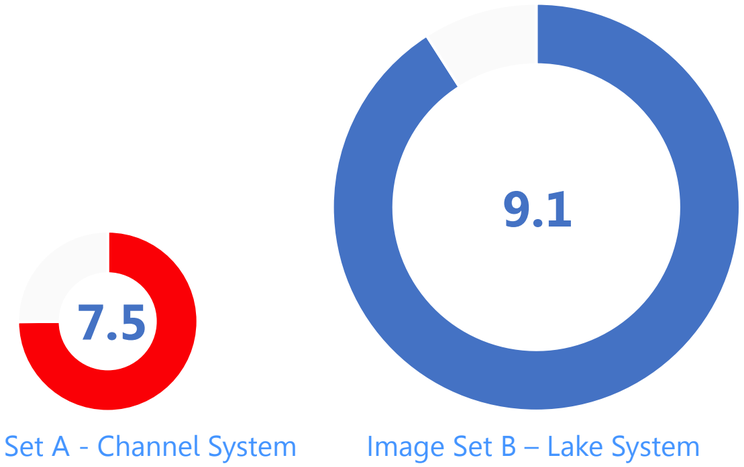
Riverlea

PLACES TO RELAX AND MEET WHILE ENHANCING LIFE

OPEN SPACE WILL PROVIDE BENEFITS IN THE FORM OF PLACES TO RELAX AND MEET

To a large extent (rated 8-10):

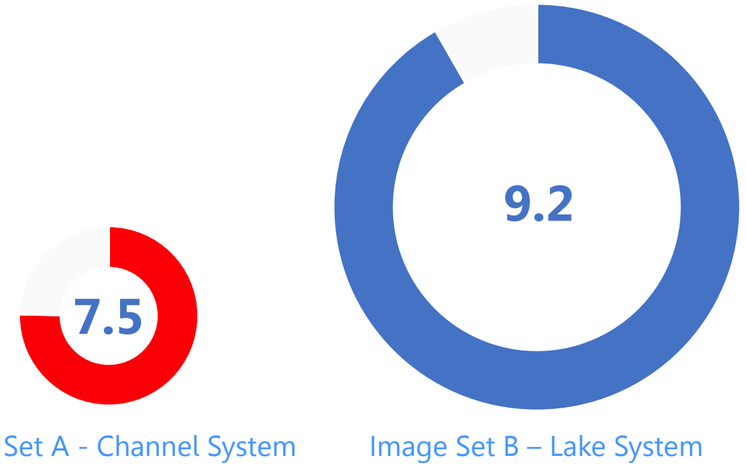
- Image Set A: 53% - mean score 7.5/10
- Image Set B: 89% - mean score 9.1/10



OPEN SPACE WILL ENHANCE THE WELLBEING AND QUALITY OF LIFE

To a large extent (rated 8-10):

- Image Set A: 53% - mean score 7.5/10
- Image Set B: 88% - mean score 9.2/10



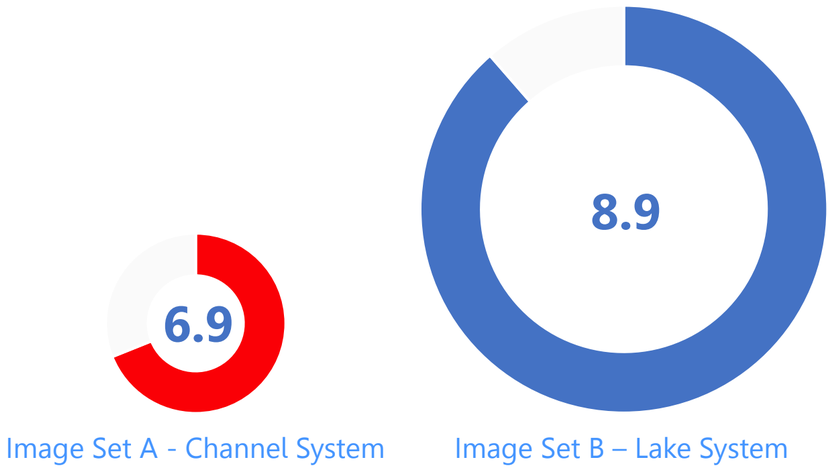
Riverlea

FESTIVALS AND EVENTS AND CREATING A SENSE OF PRIDE

OPEN SPACE WILL PROVIDE OPPORTUNITIES FOR FESTIVALS AND EVENTS

To a large extent (rated 8-10):

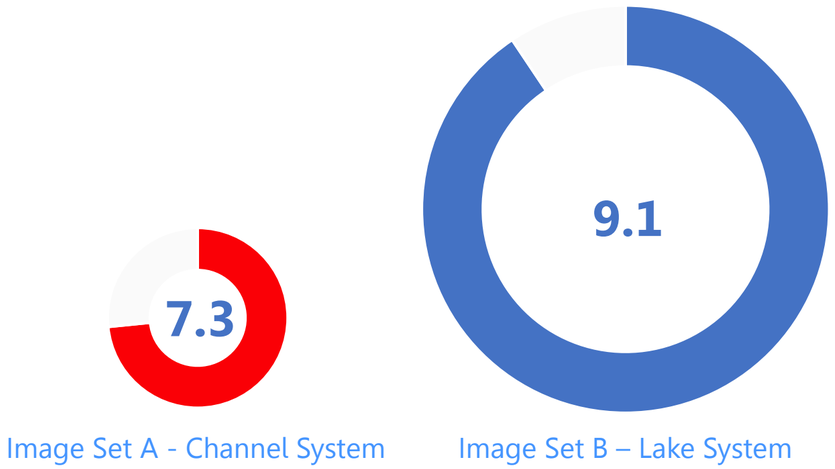
- Image Set A: 49% - mean score 6.9
- Image Set B: 82% - mean score 8.9



OPEN SPACE WILL CREATE A SENSE OF PRIDE WITHIN THE COMMUNITY

To a large extent (rated 8-10):

- Image Set A: 51% - mean score 7.3
- Image Set B: 85% - mean score 9.1



Riverlea

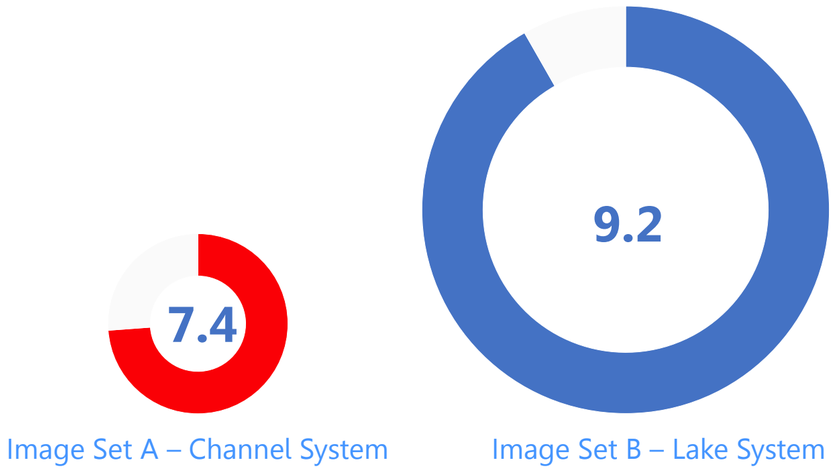
RECOMMENDING THE PREFERED VERSUS NON-PREFERRED SYSTEM

RECOMMENDING VISITING THE PREFERRED OPEN SPACE AREA TO FRIENDS OR FAMILY

RECOMMENDING TO FRIENDS AND FAMILY

On a scale of 1 to 10:

- Image Set A respondents gave an average rating of 7.4/10 with 83% likely to recommend the Channel System option to friends and family (6-10 score)
- Image Set B respondents gave an average rating of 9.2/10 with 97% likely to recommend the Lake System option to friends and family (6-10 score)



Riverlea

RECOMMENDING VISITING THE NON-PREFERRED OPEN SPACE AREA TO FRIENDS OR FAMILY

RECOMMENDING THE NON-PREFERRED OPEN SPACE AREA

On a scale of 1 to 10:

- Image Set A respondents gave an average rating of 6.6/10 with 68% likely to recommend the Lake System option to friends and family (6-10 score)
- Image Set B respondents gave an average rating of 4.2/10 with 31% likely to recommend the Channel System option to friends and family (6-10 score)

Image Set A respondents likely to recommend the Lake System option

Image Set B respondents likely to recommend the Channel System option

Riverlea

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

The online survey findings have demonstrated beyond doubt that the local and broader communities strongly prefer the Lake System option (93% preference) over the Channel System option (7% preference). In particular the Lake System open space option achieved:

- A 9.2/10 overall rating for making Riverlea an attractive place when the Lake System open space is completed.
- A 9.1/10 rating for making Riverlea a more attractive place to live in.
- A 9.1/10 rating for making Riverlea a more attractive place for people to visit.
- A 9.0/10 rating for making Riverlea a welcoming environment for people to socialise.
- A 9.2/10 rating for promoting a healthy lifestyle.
- An 8.5/10 rating for providing safe and secure access for all people.
- An 8.5/10 rating for filling a need in the area for a modern and attractive destination.
- A 9.1/10 rating for providing benefits in the form of places to relax and meet.
- An 8.9/10 rating for providing opportunities for festivals and events.
- A 9.1/10 rating for creating a sense of pride within the community.

SUMMARY AND CONCLUSIONS
(Continued)

The online survey findings highlighted that the Lake System open space option is highly likely to influence recommendations to friends or family for Riverlea to be a place to visit, rating 9.2 out of a possible 10.

In conclusion the Lake System option in not only strongly preferred by the local and surrounding communities, it is also the catalyst for a series of highly favourable perceptions by future residents of, and visitors to, Riverlea.

When the research findings are overlayed on the financial analysis undertaken by BDO EconSearch, it is clear that the Lake System option is highly beneficial to Council and its constituents.

26. Appendix P – BDO EconSearch Report

A Report for Hudson Howells on behalf of Walker Buckland Park Developments

25 November 2022

Prepared by

BDO EconSearch

Level 7, BDO Centre, 420 King William Street
Adelaide SA 5000
Tel: +61 (8) 7324 6190
https://www.bdo.com.au/en-au/econsearch

TABLE OF CONTENTS

TABLES

FIGURES

ABBREVIATIONS

LGA	Local Government Area
NPV	net present value
PV	present value

DOCUMENT HISTORY AND STATUS

Doc Version	Doc Status	Issued To	Qty elec	Date	Reviewed	Approved
1	Draft	Neil Howells	1 Word 1 PDF	5/08/2022	ADM	ADM
2	Final Draft	Neil Howells	1 Word 1 PDF	25/08/2022	ADM	ADM
3	Final	Neil Howells	1 Word 1 PDF	25/11/2022	ADM	ADM

Last Saved:	25/11/2022 2:23:00 PM
File Name:	I:\CLIENTS\Hudson Howells\ES2222_Riverlea Development Costing\Reports\Riverlea Salt Lakes Financial Analysis_Final_221125.docx
Project Manager:	Anders Magnusson
Principal Author/s:	Lisa Carlin
Name of Client:	Hudson Howells on behalf of Walker Buckland Park Developments
Name of Project:	Riverlea Salt Lakes System Financial Analysis
Document Version:	3
Job Number:	ES2222

EXECUTIVE SUMMARY

Introduction

Walker Buckland Park Developments (Walker) is developing Riverlea at Riverlea Park (previously known as Buckland Park). Riverlea is a major development within the City of Playford local government area, located approximately 30km north of the Adelaide Central Business District. A 1,340ha master-planned community, Riverlea is expected to deliver up to 12,000 residential properties, supported by schools, centres and public transport and 450ha of open space including a 40ha salt water lake system, for a new community of approximately 33,000 residents to be developed over 25 years.

In November 2007 Hudson Howells, the longest running boutique management consulting business in Adelaide, undertook an economic assessment of the Riverlea development (Hudson Howells 2008). The study aimed to identify employment opportunities created during construction and operation and the flow-on employment resulting from these employment opportunities. Hudson Howells estimated that by 2036 the Riverlea development would generate 10,687 fte jobs directly in retail, wholesale, education, commercial, office, community and light industry, industry, service and trade sectors. These estimates were based on estimates of the number of jobs per square metre by industry sourced from Connor Holmes (2008). In terms of the Playford Local Government Area (LGA) workforce, 32,652 persons in 2016[1] (ABS 2017), this would result in a one-third increase by 2036.

Stormwater and flood mitigation is an important part of any new housing development. In the original development application Walker proposed an extensive network of floodways and a small (3.5ha) freshwater lake as a solution for stormwater and flood mitigation. However, subsequently Walker now propose a larger (40ha) salt water lake with a system of parkland links incorporating shallow overland flow pathways and minimal floodways to mitigate floods. It is a key item of amenity for the Riverlea project which is expected to play a key role in stormwater management, visual amenity and recreational amenity. The City of Playford (the Council) will be the ultimate owner of all public infrastructure within Riverlea including the salt water lake system. The salt water lake system will have ongoing operation and maintenance costs as well as asset replacement requirements over time. Walker received endorsement from the Council on 22 August 2022 for the salt water lake system and is now seeking full approval to proceed with delivery of the lakes.

In its initial response to the proposal, the Council raised the issue of the operational and maintenance costs and asset replacement costs which they will be required to fund. Walker has identified these costs but now seeks to establish the benefit which the Council are expected to receive through the delivery of the project. As such BDO EconSearch have been engaged to undertake a financial analysis of the salt water lake system for Walker, which will be used to seek endorsement from the City of Playford and will ultimately be used to seek full approval from Council to proceed with delivery of the lakes.

BDO EconSearch was established in 1995 to provide economic research and consulting services in the agricultural and resource industries throughout Australia. The firm provides independent economic analysis and policy advice to firms, industry associations, research and development corporations, regional development boards, government agencies and other organisations. BDO EconSearch has conducted assignments throughout Australia and works in collaboration with a range of other consulting companies and research institutions (engineering, horticultural, accounting, marketing, etc.) and is well placed to contribute to multi-consultant and multi-disciplinary studies.

[1] Labour force 2021 Census due for release in October 2022.

Method

The analysis conducted for this project conforms to South Australian and Commonwealth Government guidelines for conducting evaluations of public sector projects (Department of Treasury and Finance (2014) and Department of Finance and Administration (2006). The costs and benefits of the Lakes Option were measured using a 'with' and 'without' project framework, that is, quantification of the incremental changes associated with the Lakes Option (i.e. the salt water lake system) compared to the Base Case, from the point of view of Council.

A description of the options is as follows:

Base case 3.5ha Freshwater lake and extensive network of floodways for stormwater and flood mitigation.

Lakes Option 40ha Salt water lake system with parkland links incorporating shallow overland flow pathways and minimal floodways for stormwater and flood mitigation which is expected to increase sales demand for residential and commercial properties relative to the base case as a result of higher amenity, wellness and wellbeing for residents.

Given that costs and benefits were specified in real terms (i.e. constant 2022 dollars), future nominal values were converted to present values by applying a discount rate of 6 per cent. The choice of discount rate is consistent with the rate advised by South Australian Government guidelines for conducting evaluations of public sector projects (2014).

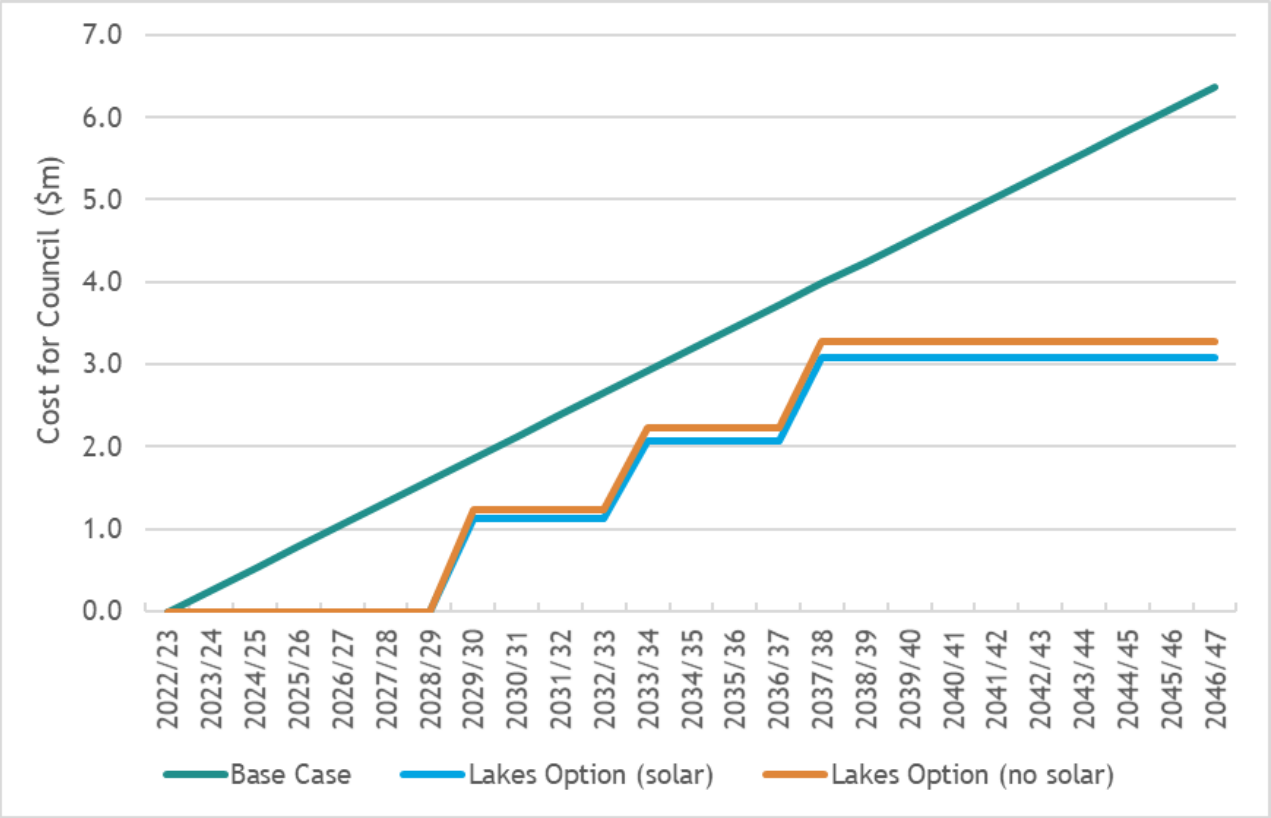
The evaluation criterion employed for this analysis was Net Present Value (NPV), which is the discounted option benefits less discounted option costs, measured in Dollars and relative to the Base Case. Under this decision rule the option is considered to be potentially viable if the NPV is greater than zero.

Data and Assumptions

The schedule of costs which Council would be required to fund under the Base Case and the Lakes Option is shown in Figure ES-1. The annual cost for maintenance of the Base Case was based on October 2022 tendered rates for landscape maintenance works at Riverlea. Walker expect to progressively pass on the costs to council over the 25 year period so the full annual cost ($6.37m) is passed on to Council in year 25 (2046/47). Costs would include system, water body and edge maintenance.

The annual cost for operation and maintenance of the Lakes Option was also based on October 2022 tendered rates for landscape maintenance works at Riverlea. The three phases of the lake system construction will be staged over approximately a 15 year period, meaning the earlier phases would operate independently until the latter phases are constructed and become operational. After five years from practical completion of each phase, and upon rectification of any known salt water lake system defects (except wear and tear), Council would assume the operation and maintenance of the system from Walker Corporation. Total cost for operating and maintenance of the system will be handed over to Council in year 16 (2037/38) at $3.08m.

Figure ES-1 Schedule of annual costs for the Base Case and Lakes Option



Source: Walker assumptions

The core analysis conservatively assumes no annual growth in property values but a sensitivity analysis was undertaken on a 3 per cent annual decline and 3 per cent and a 6 per cent annual increases in property values. A report prepared by CoreLogic, the largest custodian of property data in Australia, and Aussie, a leading home loan and mortgage broker, stated a 5.9 per cent annual increase in Adelaide house prices over the 25 year period to 2018 (CoreLogic and Aussie 2018). However, property prices have been widely reported to have peaked in most capital cities as cited in a CoreLogic research article *"In July, Australian home values were 2 per cent lower than the peak in April 2022. On top of price declines, many other data points suggest a slowing in market conditions"* (CoreLogic 2022). Therefore, a sensitivity analysis on a 6 per cent increase would provide an upper bound for any possible property price increases.

The core analysis also assumes a sales schedule of 40 houses per month under the base case and 50 houses per month under the Lakes option. The average improved capital value under the Lakes Option ($810,000) was provided by Walker and was based on Riverlea property sales which have occurred to date. The assumption of a 20 per cent lower average improved capital value under the Base Case is based on Walker sales consultants experience in similar developments elsewhere in Australia. These assumptions were also analysed in the sensitivity analysis.

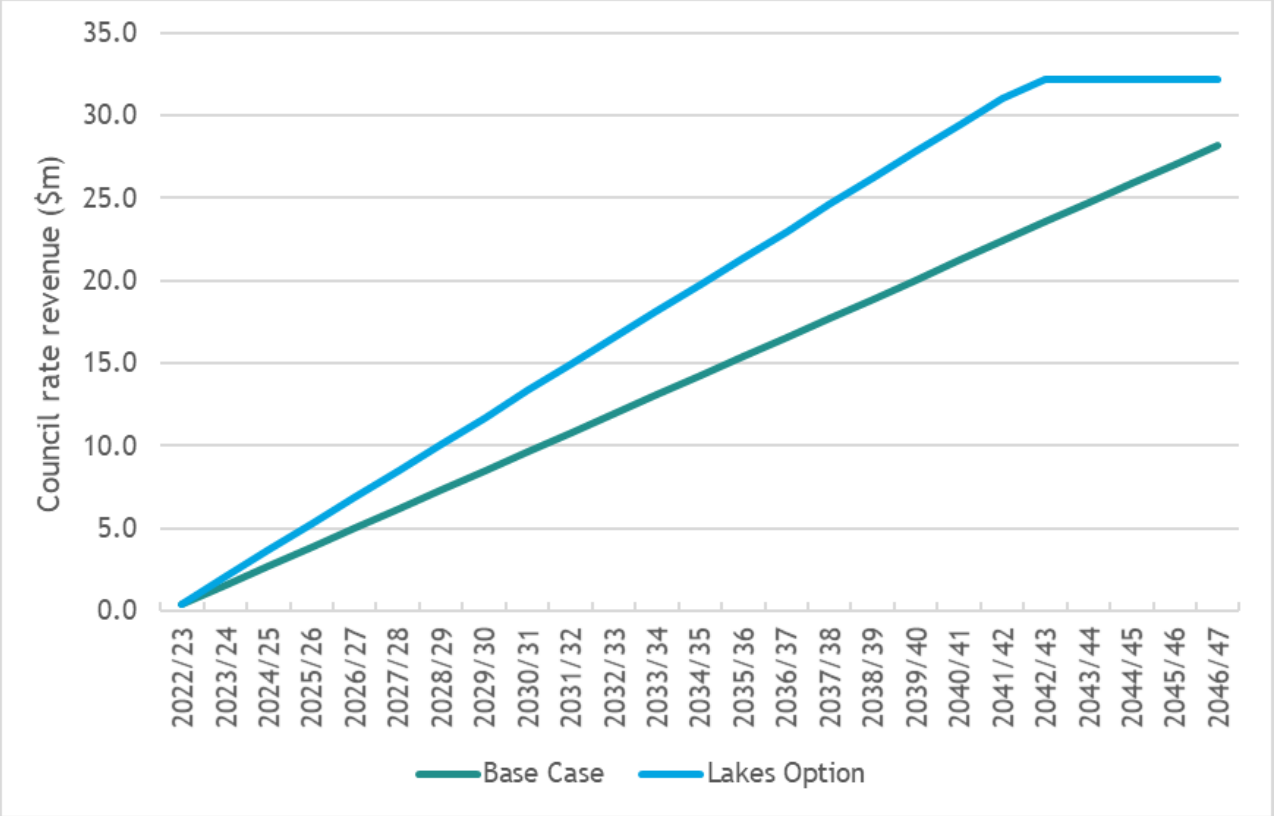
General rate revenue estimated under the Base Case and Lakes Option will add significantly to the current rate revenue received by the Council. As described by the Council *"Money raised through rates assists Council to provide the Playford community with a wide range of services. These include existing ongoing, core services such as keeping our streets clean, rubbish removal, running immunisation clinics, operating libraries and community programs, as well as renewing, replacing and building new assets such as*

footpaths, roads and sporting grounds" (City of Playford 2022a). General rate revenue expected is expected to be $74.7m in 2022/23 (City of Playford 2022b).

Under the Lakes Option general rate revenue is expected to stabilise in year 21 (2042/43) at $32.2m (Figure ES-2) when it is estimated the 12,000 homes will have been sold. This amount would significantly increase the general rate revenue expected for 2022/23.

Under the Base Case general rate revenue is not expected to stabilise during the 25 year period of analysis as a result of the anticipated 12,000 total homes not being reached under the assumed sales demand schedule. In this case general rate revenue from the development would reach $28.2m in year 25 (2046/47) (Figure ES-2).

Figure ES-2 Schedule of Council rate revenue for the Base Case and Lakes Option



Source: EconSearch analysis

The City of Playford set their general rate revenue to the cost of providing services and to maintain community infrastructure. The Council's rating structure allows for a maximum of 50 per cent of Council's total general rate revenue to come from a fixed charge and 50 per cent is collected from a differential charge. The differential charge is based on a rate in the dollar applied to the capital value of properties (City of Playford 2022b).

The amount of general rate income raised under the Base Case and the Lakes Option has been described above. However, since 50 per cent of the amount received by Council is based on the capital value of properties and under the Lakes Option Walker expects a higher average capital value as a result of improved visual and community amenity, Council would receive a premium on properties under the Lakes Option since the per unit cost to provide services does not increase in line with the capital value of a property in this

case. This benefit is presented in this report as a financial benefit to the Council but could be passed on to rate payers in the form of a lower rate in the dollar of capital value.

Results

Table ES-1 shows the results of the financial analysis in present value term. In each year of the 25 year period costs to maintain the Base Case is expected to exceed the costs to operate and maintain the Lakes Option. This means that from a pure cost perspective, the Lakes Option is preferred to the Base Case and that the costs for Council to maintain the Base Case are greater than the costs to maintain the Lakes Option in every year of the analysis.

Table ES-1 Present value of result of the financial analysis ($m)

	Expected Council Benefit		
	No lakes	With lakes	Net benefit of lakes
Rate income	147.46	198.96	51.50
Residual capital value	0.00	2.35	2.35
Provision of Council Services	-147.46	-178.69	-31.23
Capital replacement costs	0.00	-0.06	-0.06
Maintenance costs	-32.60	-16.77	15.84
Total	-32.60	5.80	38.40

Source: BDO EconSearch analysis

In addition, the increased sales demand from improved visual and recreational amenity under the Lakes Option is expected to bring forward the increase in general rate revenue compared to that which would be received under the open channel Base Case. The net present value (NPV) of $38.4m indicates that, relative to the Base Case, the Lakes Option is expected to generate a net benefit to Council of $38.4m over a 25 year period. The decision rule is that the investment is preferred to the Base Case if the NPV is greater than zero.

A NPV of $38.4m over the 25 year period of analysis represents an annual net benefit for Council of $1.5m. This annual benefit would increase the expected operating surplus for 2022/23 ($1.9m (City of Playford 2022b)). This benefit is presented in this report as a financial benefit to the Council but could be passed on to rate payers in the form of a lower rate in the dollar of capital value.

A sensitivity analysis found that the NPV for the Lakes Option remains positive over a reasonable range of assumed values for key variables in the analysis.

In summary, the Lakes Option is preferred to the Base Case as a stormwater and flood mitigation solution. Not only will the Lakes Option cost less than the Base Case option to operate and maintain, it is expected to bring forward the increase in general rate revenue compared to that which would be received under the Base Case. This is a significantly positive benefit to council and will serve to underpin the 10,000 employment impact expected from the Riverlea project.

1. INTRODUCTION

Walker Buckland Park Developments (Walker) is developing Riverlea at Riverlea Park (previously known as Buckland Park). Riverlea is a major development within the City of Playford local government area, located approximately 30km north of the Adelaide Central Business District. A 1,340ha master-planned community, Riverlea is expected to deliver up to 12,000 residential properties, supported by schools, centres and public transport and 450ha of open space including a 40ha salt water lake system, for a new community of approximately 33,000 residents to be developed over 25 years.

In November 2007 Hudson Howells, the longest running boutique management consulting business in Adelaide, undertook an economic assessment of the Riverlea development (Hudson Howells 2008). The study aimed to identify employment opportunities created during construction and operation and the flow-on employment resulting from these employment opportunities. Hudson Howells estimated that by 2036 the Riverlea development would generate 10,687 fte jobs directly in retail, wholesale, education, commercial, office, community and light industry, industry, service and trade sectors. These estimates were based on estimates of the number of jobs per square metre by industry sourced from Connor Holmes (2008). In terms of the Playford Local Government Area (LGA) workforce, 32,652 persons in 2016[2] (ABS 2017), this would result in a one-third increase by 2036.

Stormwater and flood mitigation is an important part of any new housing development. In the original development application Walker proposed an extensive network of floodways and a small (3.5 Ha) freshwater lake as a solution for stormwater and flood mitigation. However, subsequently Walker now propose a larger (40 Ha) salt water lake with a system of parkland links incorporating shallow overland flow pathways and minimal floodways to mitigate floods. It is a key item of amenity for the Riverlea project which is expected to play a key role in stormwater management, visual amenity and recreational amenity. The City of Playford (the Council) will be the ultimate owner of all public infrastructure within Riverlea including the salt water lake system. The salt water lake system will have ongoing operation and maintenance costs as well as asset replacement requirements over time. Walker received endorsement from the Council on 22 August 2022 for the salt water lake system and is now seeking full approval to proceed with delivery of the lakes.

In its initial response to the proposal, the Council raised the issue of the operational and maintenance costs and asset replacement costs which they will be required to fund. Walker has identified these costs but now seeks to establish the benefit which the Council are expected to receive through the delivery of the project. As such BDO EconSearch have been engaged to undertake a financial analysis of the salt water lake system for Walker, which will be used to seek approval from the City of Playford to proceed with delivery of the lakes.

BDO EconSearch was established in 1995 to provide economic research and consulting services in the agricultural and resource industries throughout Australia. The firm provides independent economic analysis and policy advice to firms, industry associations, research and development corporations, regional development boards, government agencies and other organisations. BDO EconSearch has conducted assignments throughout Australia and works in collaboration with a range of other consulting companies and research institutions (engineering, horticultural, accounting, marketing, etc.) and is well placed to contribute to multi-consultant and multi-disciplinary studies.

[2] Labour force 2021 Census due for release in October 2022.

This report presents the results of a financial analysis of the proposed Riverlea salt water lakes system. The remainder of this report is structured with methods of analysis, data and assumptions in Section 2 and the financial analysis results and sensitivity analysis in Section 3.

2. METHOD OF ANALYSIS AND DATA

2.1. Scenarios

A key objective of this study was to undertake a financial analysis to determine the net benefit to Council of the salt water lake system. The proposed salt water lake system was compared against a base case, as described in Table 2-1. The Base Case and Lakes Option are further described in the following sections.

Table 2-1 Alternative scenarios for the financial analysis

Option	Description
Base Case	3.5ha Freshwater lake and extensive network of floodways for stormwater and flood mitigation.
Lakes Option	40ha Salt water lake system with parkland links incorporating shallow overland flow pathways and minimal floodways to mitigate floods. which is expected to increase sales demand for residential and commercial properties relative to the base case as a result of higher amenity, wellness and wellbeing for residents.

2.2. Method of Analysis

The analysis conducted for this project conforms to South Australian and Commonwealth Government guidelines for conducting evaluations of public sector projects (Department of Treasury and Finance (2014) and Department of Finance and Administration (2006). The starting point for the financial analysis was to develop the Base Case scenario, that is, the benchmark against which the project was compared (described in Section 2.1 above). The following steps, as prescribed in the Department of Treasury and Finance (2014) guidelines, were:

- Establish the time frame over which the proposal is to be assessed.
- Delineate the scope of the assessment of costs and benefits.
- Identify the impacts, how they will be measured and any uncertainties surrounding them.
- Timeline the impacts.
- Undertake cost-effectiveness analysis (CEA) for non-monetised measurable impacts if applicable.
- Undertake financial analysis for impacts measurable in monetary terms.
- Undertake the net present value (NPV) calculations.
- Describe all other significant non-measurable cost and benefit impacts.
- Undertake sensitivity and scenario analysis.
- Rank the options (including the base case) in order of preference according to the NPV.
- Document all assumptions applied, basis of calculations and sources of information.

Given that costs and benefits were specified in real terms (i.e. constant 2022 dollars), future nominal values were converted to present values by applying a discount rate of 6 per cent. The choice of discount rate is consistent with the rate advised by South Australian Government guidelines for conducting evaluations of public sector projects (2014).

Results were expressed in terms of net benefits, that is, the incremental benefits and costs of the lakes system (option) relative to those generated by the Base Case. The evaluation criterion employed for this analysis was Net present value (NPV), which is the discounted option benefits less discounted option costs. Under this decision rule the option is considered to be potentially viable if the NPV is greater than zero. The NPV for the Option (opt) was calculated as an incremental NPV, using the standard formulation:

$$NPV_{opt} = PV\left(B_{opt} - B_{Base\ Case}\right) - PV\left(C_{opt} - C_{Base\ Case}\right)$$

2.3. Costs and Benefits

The major costs and benefits of the project are listed in Table 2-2.

Table 2-2 Costs and benefits in the scope of the financial analysis

Item	Cost or Benefit	Description
Base Case		
Council rate income	Benefit	Using current Council rates [a] with no real increase and based on demand of 40 residential properties sold per month [b] with an average improved capital value of $675,000/property [c]
Provision of Council services	Cost	The general Council rate income received is set to cover the provision of Council services (e.g. cost of provision of Council services is equal to the general rate income received).
Operating and maintenance costs	Cost	Cost of maintenance would be progressively passed onto council over the 25 year period with the full amount of $6.37m passed on in year 25 (2046/47).
Lakes Option		
Council rate income	Benefit	Using current Council rates [a] with no real increase and based on demand of 50 residential properties sold per month [b] with an average improved capital value of $810,000/property [d]
Residual capital value	Benefit	The estimated useful life of some capital items (e.g. pipes, pump house, power supply, etc.) extends beyond the period of analysis (25 years). As such, these capital items have a residual capital analysis in year 25, $9.5m.
Provision of Council Services	Cost	The general Council rate income received is set to cover the provision of Council services (e.g. cost of provision of Council services is equal to the general rate income received). Except under the Lakes Option the cost to provide these services does not increase in line with increased capital value (e.g. cost is based on an average improved capital value of $675,000, the same as under the Base Case).
Operating and maintenance costs	Cost	Phase one of the lake system is expected to be operational in year 3 (2024/25) with related costs handed over to Council 4 years later (2029/30). Phase two is expected to be operational in year 7 (2028/29) with related costs handed over to Council 4 years later (2029/30). Phase three is expected to be operational in year 11 (2032/33) with related costs handed over to Council 4 years later (2037/38). These costs are anticipated to reach a steady state in year 16 (2037/38) at around $3.1m.
Capital replacement costs	Cost	Over the period of analysis capital replacement costs of $71,500 are required for the solar inverters in year 11 (2032/33) and year 22 (2043/44).

[a] 50 per cent fixed charge of $1,042.95/property and 50 per cent on $0.00202589/$ capital value (City of Playford 2022a).

[b] Demand estimated by Walker.

[c] Assumed 15 per cent lower than under the Lakes Option (Walker).

[d] Assumed value from Walker.

The costs and benefits of the option were measured using a 'with' and 'without' project framework, that is, quantification of the incremental changes associated with the Lakes Option compared to the Base Case. The method, data sources and assumptions used to quantify these values are described below. Consideration was given to those benefits and costs likely to occur over a 25-year period.

2.4. Data and Assumptions

Council rate income

General rate revenue for Council under the Base Case and Lakes Option are based on the sales schedule and average home value detailed in Table 2-3 and general rate information detailed in Table 2-4.

Table 2-3 Assumptions to estimate general rate revenue

	Base Case	Lakes Option
Sales schedule	40 houses/month	50 houses/month
Average improved capital value	$675,000	$810,000

Source: Walker pers. comm.

Table 2-4 City of Playford general rates, 2022/23

	Amount
Fixed charge per property ($)	1,042.95
General rate in the dollar of capital value 2022/23 ($)	0.00202589

Source: City of Playford (2022a)

The core analysis conservatively assumes no annual growth in property values but a sensitivity analysis was undertaken on a 3 per cent annual decline and 3 per cent and a 6 per cent annual increases in property values. A report prepared by CoreLogic, the largest custodian of property data in Australia, and Aussie, a leading home loan and mortgage broker, stated a 5.9 per cent annual increase in Adelaide house prices over the 25 year period to 2018 (CoreLogic and Aussie 2018). However, property prices have been widely reported to have peaked in most capital cities as cited in a CoreLogic research article *"In July, Australian home values were 2 per cent lower than the peak in April 2022. On top of price declines, many other data points suggest a slowing in market conditions"* (CoreLogic 2022). Therefore, a sensitivity analysis on a 6 per cent increase would provide an upper bound for any possible property price increases.

The core analysis also assumes a sales schedule of 40 houses per month under the base case and 50 houses per month under the Lakes option. The average improved capital value under the Lakes Option ($810,000) was provided by Walker and was based on Riverlea property sales which have occurred to date. The assumption of a 20 per cent lower average improved capital value under the Base Case is based on Walker sales consultants experience in similar developments elsewhere in Australia. These assumptions were also analysed in the sensitivity analysis.

General rate revenue estimated under the Base Case and Lakes Option will add significantly to the current rate revenue received by the Council. As described by the Council *"Money raised through rates assists Council to provide the Playford community with a wide range of services. These include existing ongoing, core services such as keeping our streets clean, rubbish removal, running immunisation clinics, operating libraries and community programs, as well as renewing, replacing and building new assets such as*

footpaths, roads and sporting grounds" (City of Playford 2022a). General rate revenue expected is expected to be $74.7m in 2022/23 (City of Playford 2022b).

Under the Lakes Option general rate revenue is expected to stabilise in year 21 (2042/43) at $32.2m when it is estimated the 12,000 homes will have been sold. This amount would significantly increase the general rate revenue expected for 2022/23.

Under the Base Case general rate revenue is not expected to stabilise during the 25 year period of analysis as a result of the anticipated 12,000 total homes not being reached under the assumed sales demand schedule. In this case general rate revenue from the development would reach $28.2m in year 25 (2046/47).

Provision of Council Services

The City of Playford set their general rate revenue to the cost of providing services and to maintain community infrastructure. The Council's rating structure allows for a maximum of 50 per cent of Council's total general rate revenue to come from a fixed charge and 50 per cent is collected from a differential charge. The differential charge is based on a rate in the dollar applied to the capital value of properties (See Table 2-4) (City of Playford 2022b).

The amount of general rate income raised under the Base Case and the Lakes Option has been described above. However, since 50 per cent of the amount received by Council is based on the capital value of properties and under the Lakes Option Walker expects a higher average capital value as a result of improved visual and community amenity, Council would receive a premium on properties under the Lakes Option since the per unit cost to provide services does not increase in line with the capital value of a property. This benefit is presented in this report as a financial benefit to the Council but could be passed on to rate payers in the form of a lower rate in the dollar of capital value.

Operation and maintenance costs

The annual cost for maintenance of the Base Case was based on October 2022 tendered rates for landscape maintenance works at Riverlea. Walker expect to progressively pass on the costs to council over the 25 year period so the full annual cost ($6.37m) is passed on to Council in year 25 (2046/47). Costs would include system, water body and edge maintenance.

The annual cost for operation and maintenance of the Lakes Option was also based on October 2022 tendered rates for landscape maintenance works at Riverlea. The three phases of the lake system construction will be staged over approximately a 15 year period, meaning the earlier phases would operate independently until the latter phases are constructed and become operational. After five years from practical completion of each phase, and upon rectification of any known salt water lake system defects (except wear and tear), Council would assume the operation and maintenance of the system from Walker Corporation. Total cost for operating and maintenance of the system will be handed over to Council in year 16 (2037/38) at $3.08m.

Residual capital value

The estimated useful life of some capital items (e.g. pipes, pump house, power supply, etc.) extends beyond the period of analysis (25 years). As such, these capital items have a residual capital analysis in year 25 of $9.5m.

Capital replacement costs

Over the period of analysis capital replacement costs of $71,500 are required for the solar inverters in year 11 (2032/33) and year 22 (2043/44) (Walker pers. comm.). These solar inverters have a useful life of 10 years.

Commercial rate revenue (not quantified)

As a result of the increased sales demand, and resulting higher population, under the Lakes Option, Walker expect a greater take up of commercial/retail leases which is likely to result in increased commercial rate revenue for Council over that which would be received under the Base Case. This benefit has not been monetised due to uncertainty about the structure of the commercial development and its capital value, but would improve the benefit of the Lakes Option. The benefit of greater uptake of commercial/retail leases under the Lakes Option extends beyond that which will be realised by council. It will bring forward significant employment opportunities in retail and transport industries.

3. RESULTS

The results of the analysis have been expressed in terms of net present value (NPV). The NPV is a measure of the aggregate, annual net benefits (i.e. benefits - costs) of the Lakes Option over a 25 year period, discounted (i.e. expressed as a present value) using a discount rate of 6 per cent. If the NPV for a scenario is positive, then it is preferred to the Base Case. The results of the financial analysis, in terms of the NPV, are presented in Table 3-1.

Cost benefit analyses usually also produce a benefit cost ratio (BCR) and/or internal rate of return (IRR) but these cannot be produced for this analysis as the Lakes Option is favourable to the base case from both a pure cost perspective and from a cost versus benefit perspective, making the BCR and IRR undefined.

Table 3-1 Present value of result of the financial analysis ($m)

		Expected Council Benefit	
	No lakes	With lakes	Net benefit of lakes
Rate income	147.46	198.96	51.50
Residual capital value	0.00	2.35	2.35
Provision of Council Services	-147.46	-178.69	-31.23
Capital replacement costs	0.00	-0.06	-0.06
Maintenance costs	-32.60	-16.77	15.84
Total	-32.60	5.80	38.40

Source: BDO EconSearch analysis

In each year of the 25 year period costs to maintain the Base Case is expected to exceed the costs to operate and maintain the Lakes Option. This means that from a pure cost perspective, the Lakes Option is preferred to the Base Case and that the costs for Council to maintain the Base Case are greater than the costs to maintain the Lakes Option in every year of the analysis.

In addition, the increased sales demand from improved visual and recreational amenity under the Lakes Option is expected to bring forward the increase in general rate revenue compared to that which would be received under the Base Case. The net present value (NPV) of $38.4m indicates that, relative to the Base Case, the Lakes Option is expected to generate a net benefit to Council of $38.4m over a 25 year period. The decision rule is that the investment is preferred to the Base Case if the NPV is greater than zero.

A NPV of $38.4m over the 25 year period of analysis represents an annual net benefit for Council of $1.5m. This annual benefit would increase the expected operating surplus for 2022/23 ($1.9m (City of Playford 2022b)). This benefit could either be received by Council as additional revenue or passed on to rate payers in the form of a lower rate in the dollar of capital value.

In summary, the Lakes Option is preferred to the Base Case as a stormwater and flood mitigation solution. Not only will the Lakes Option cost less than the Base Case to operate and maintain, it is expected to bring forward the increase in general rate revenue compared to that which would be received under the Base Case. This is a significantly positive benefit to council and will serve to underpin the 10,000 employment impact expected from the Riverlea project.

3.1. Sensitivity Analysis

The results of the financial analysis were re-estimated using values for key variables that reflect the uncertainty of those variables. The sensitivity analysis included the following:

a) discount rate

b) sales demand

c) property value premium

d) annual increase in property values

e) Lakes maintenance costs

The range of values used for each uncertain variable and detailed results of the sensitivity analysis are set out in Table 3-2 and Table 3-3 along with the conclusions. Note that the sensitivity analysis for each uncertain variable was undertaken by holding all other variables constant at their 'assumed' values.

Table 3-2 Results of the sensitivity analysis

(a) Discount rate

Scenario	Discount rate	NPV ($m)	Conclusion
Low	4%	50.6	The result remains positive across a reasonable range of assumed discount rates.
Assumed	6%	38.4	
High	8%	29.8	

(b) Sales demand

Scenario	Properties sold/month	NPV ($m)	Conclusion
No increase	40	34.5	The result remains positive if sales demand under the Lakes Option is lower than expected and even with no increase in sales demand over the Base Case the Lakes Option is still positive. An increase in sales demand for the Lakes Option makes the result more positive.
Low	45	36.4	
Assumed	50	38.4	
High	55	40.4	

(c) Property value premium

Scenario	Value ($)	NPV ($m)	Conclusion
No premium	675,000	18.1	The result remains positive if the premium in property values under the Lakes Option is lower than expected and even with no premium the Lakes Option is still positive.
Low premium	725,000	25.6	
Moderate premium	775,000	33.1	
Assumed premium	810,000	38.4	

(d) Annual increase in property values

Scenario	Annual increase	NPV ($m)	Conclusion
Low decrease	-3%	37.3	The result remains positive if the annual increase in property values under the Lakes Option is lower than expected. A higher increase in property values for the Lakes Option makes the result more positive.
No increase (assumed)	0%	38.4	
Low increase	3%	39.5	
Moderate increase	6%	40.7	

Table 3-3 Results of the sensitivity analysis (cont.)

(e) Lakes maintenance costs

Scenario	% Change in expect value	NPV ($m)	Conclusion
Low decrease	-5%	39.2	The results were insensitive to changes in the Lakes operating and maintenance costs within the values analysed.
No increase (assumed)	0%	38.4	
Low increase	10%	36.7	
Moderate increase	20%	35.0	

Source: BDO EconSearch analysis

REFERENCES

Australian Bureau of Statistics (ABS) 2017, *2016 Census of Population and Housing*, Canberra.

City of Playford 2022a, *Rates FAQ*, website https://www.playford.sa.gov.au/live/home-and-property/rates/rates-faq accessed 27/07/2022.

City of Playford 2022b, *Annual Business Plan and Budget 2022/23,* City of Playford.

Connor Holmes 2008, *Buckland Park Demographic Analysis*.

CoreLogic 2022, *Property Prices are falling - is it a good time to buy?*, accessed via https://www.corelogic.com.au/news-research/news/2022/property-prices-are-falling-is-it-a-good-time-to-buy on 24/08/2022.

CoreLogic and Aussie 2018, *25 Years of Housing Trends,* accessed via https://www.aussie.com.au/content/dam/aussie/documents/home-loans/aussie_25_years_report.pdf on 05/08/2022.

Department of Finance and Administration 2006, *Handbook of Cost-Benefit Analysis*, Financial Management Reference Material No. 6, Commonwealth of Australia, Canberra.

Department of Treasury and Finance 2014, *Guidelines for the Evaluation of Public Sector Initiatives, Part B: Investment Evaluation Process*, South Australia.

Hudson Howells 2008, *Buckland Park Proposal Economic Assessment,* report prepared for the Walker Corporation, December.

Place Design Group 2020, *Appendix D - Riverlea Park Saline Lakes: Landscape Maintenance Cost and Benefits,* prepared for Walker Corporation, Revision 01, October.

Walker Corporation 2022, *Lake Saltwater Circulation System - Cost Estimate of Intake, Circulation and Outlet System,* March.

WSP 2022, *Riverlea Development: Salt Water Lakes Circulation System Concept Review Report*, report prepared for Walker Corporation, February.

Disclaimer

The assignment is a consulting engagement as outlined in the 'Framework for Assurance Engagements', issued by the Auditing and Assurances Standards Board, Section 17. Consulting engagements employ an assurance practitioner's technical skills, education, observations, experiences and knowledge of the consulting process. The consulting process is an analytical process that typically involves some combination of activities relating to: objective-setting, fact-finding, definition of problems or opportunities, evaluation of alternatives, development of recommendations including actions, communication of results, and sometimes implementation and follow-up.

The nature and scope of work has been determined by agreement between BDO and the Client. This consulting engagement does not meet the definition of an assurance engagement as defined in the 'Framework for Assurance Engagements', issued by the Auditing and Assurances Standards Board, Section 10.

Except as otherwise noted in this report, we have not performed any testing on the information provided to confirm its completeness and accuracy. Accordingly, we do not express such an audit opinion and readers of the report should draw their own conclusions from the results of the review, based on the scope, agreed-upon procedures carried out and findings.

APPENDIX 1 Detailed Financial Analysis Results

Appendix Table 1-1 Detailed financial analysis results, years 1-13

	Present Value	1 2022/23	2 2023/24	3 2024/25	4 2025/26	5 2026/27	6 2027/28	7 2028/29	8 2029/30	9 2030/31	10 2031/32	11 2032/33	12 2033/34	13 2034/35
Base Case														
Benefits														
Rate income	147.5	0.4	1.5	2.7	3.9	5.0	6.2	7.3	8.5	9.6	10.8	12.0	13.1	14.3
Costs														
Op & maintenance costs	32.6	0.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2
Prov. of Council services	147.5	0.4	1.5	2.7	3.9	5.0	6.2	7.3	8.5	9.6	10.8	12.0	13.1	14.3
Total Costs	180.1	0.4	1.8	3.2	4.7	6.1	7.5	8.9	10.3	11.8	13.2	14.6	16.0	17.5
Option - Salt Water Lakes System														
Benefits														
Rate income	199.0	0.4	2.0	3.7	5.3	6.9	8.5	10.1	11.7	13.3	14.9	16.5	18.1	19.8
Residual capital value	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total benefits	201.3	0.4	2.0	3.7	5.3	6.9	8.5	10.1	11.7	13.3	14.9	16.5	18.1	19.8
Costs														
Op & maintenance costs	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	2.1	2.1
Capital replacement costs	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Prov. of Council services	178.7	0.4	1.8	3.3	4.7	6.2	7.6	9.1	10.5	12.0	13.4	14.8	16.3	17.7
Total Costs	195.5	0.4	1.8	3.3	4.7	6.2	7.6	9.1	11.6	13.1	14.5	16.0	18.4	19.8
Incremental Benefits	53.9	0.0	0.5	1.0	1.4	1.9	2.3	2.8	3.2	3.7	4.1	4.6	5.0	5.5
Incremental Costs	15.5	0.0	0.0	0.0	0.1	0.1	0.1	0.1	1.3	1.3	1.3	1.4	2.3	2.4
Net Present Value	38.4	0.0	0.5	0.9	1.3	1.8	2.2	2.6	1.9	2.4	2.8	3.1	2.7	3.1
Discount Rate	6%													

Source: BDO EconSearch analysis

Appendix Table 1-2 Detailed financial analysis results, years 14-25

	Present Value	14 2035/36	15 2036/37	16 2037/38	17 2038/39	18 2039/40	19 2040/41	20 2041/42	21 2042/43	22 2043/44	23 2044/45	24 2045/46	25 2046/47
Base Case													
Benefits													
Rate income	147.5	15.4	16.6	17.7	18.9	20.1	21.2	22.4	23.5	24.7	25.8	27.0	28.2
Costs													
Op & maintenance costs	32.6	3.4	3.7	4.0	4.2	4.5	4.8	5.0	5.3	5.6	5.8	6.1	6.4
Prov. of Council services	147.5	15.4	16.6	17.7	18.9	20.1	21.2	22.4	23.5	24.7	25.8	27.0	28.2
Total Costs	180.1	18.9	20.3	21.7	23.1	24.6	26.0	27.4	28.8	30.3	31.7	33.1	34.5
Option - Salt Water Lakes System													
Benefits													
Rate income	199.0	21.4	23.0	24.6	26.2	27.8	29.4	31.0	32.2	32.2	32.2	32.2	32.2
Residual value of pumps	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5
Total benefits	201.3	21.4	23.0	24.6	26.2	27.8	29.4	31.0	32.2	32.2	32.2	32.2	41.7
Costs													
Op & maintenance costs	16.8	2.1	2.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Capital replacement costs	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Prov. of Council services	178.7	19.2	20.6	22.1	23.5	25.0	26.4	27.9	28.9	28.9	28.9	28.9	28.9
Total Costs	195.5	21.3	22.7	25.2	26.6	28.1	29.5	30.9	32.0	32.1	32.0	32.0	32.0
Incremental Benefits	53.9	5.9	6.4	6.8	7.3	7.8	8.2	8.7	8.7	7.5	6.4	5.2	13.6
Incremental Costs	15.5	2.4	2.4	3.4	3.5	3.5	3.5	3.5	3.2	1.8	0.3	-1.1	-2.5
Net Present Value	38.4	3.6	4.0	3.4	3.8	4.3	4.7	5.1	5.5	5.7	6.0	6.3	16.1
Discount Rate	6%												

Source: BDO EconSearch analysis

The results in the following table show three alternative scenarios to see how the results change given alternative assumptions. Should no solar infrastructure (and associated power costs savings) be included then the estimated NPV of the Lakes Option falls to $37.2m. Should the maintenance cost saving under the Lakes Option be excluded then the estimated NPV falls to $22.4m with solar or $21.2m without solar. These results show that even without savings from solar infrastructure or maintenance that the NPV of the Lakes Option is still positive and represents an annual net benefit for Council of $0.85m

Appendix Table 1-3 Alternative Option Results

		NPV ($m)
Scenario B: Excludes maintenance cost savings ($3.1m per annum by year 25)	No solar infrastructure	21.2
	With solar infrastructure	22.4
Scenario A: Includes maintenance cost savings ($3.1m per annum by year 25)	No solar infrastructure	37.2
	With solar infrastructure [a]	38.4

[a] Chosen scenario.

Source: BDO EconSearch analysis

1300 138 991
www.bdo.com.au

NEW SOUTH WALES
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
TASMANIA
VICTORIA
WESTERN AUSTRALIA

AUDIT • **TAX** • **ADVISORY**

27. Appendix Q – Alternate Energy Solutions - ENERVEN Report

ENERVEN™

Riverlea Development

Preliminary Report Re. Energy Management System

4 November 2022

CONTENTS

1. BACKGROUND

1.1 Walker Corporation ("**Walker**") have engaged Enerven to assist them in developing a high-level renewable energy solution to drive the saltwater lake system's water pumps at the Riverlea development.

1.2 The saltwater lake system and the water pumps will be constructed (all capex) and initially owned and operated by Walker. The asset will eventually be transferred to the City of Playford ("**Council**"). In developing an asset that will align with the Council's sustainability strategy, the preference will be for an energy solution that is both commercially sound whilst supplied from predominantly renewable sources.

1.3 Walker have not yet confirmed the quantity and size of the water pumps for the saltwater lake system but have requested that we provide some comparative data for a few difference scenarios. The pumps will run for approximately 10 hours a day most days with a 20 hour requirement for 15 days in a year. There will also be power requirements for the public street lighting and the sports and community lighting throughout the development.

1.4 Walker have requested Enerven provide a high-level preliminary report listing options for a suitable energy management system that would provide long term power supply to the pumps and aligns closely with the Council's strategy (noting that this report will be attached as an appendix to Walker's application to Council for approval of the saltwater lake system). The report will include the following:

1.4.1 detailed costings of all components comprising the proposed systems;

1.4.2 operational costs;

1.4.3 maintenance costs; and

1.4.4 life span expectancy of each component.

2. GENERAL ASSUMPTIONS AND EXCLUSIONS

2.1 Walker will be solely responsible for the sourcing, design and installation of the water pumping systems.

2.2 If required, Walker can provide suitable adjoining/nearby land for a solar farm to be constructed on (it is Walker's responsibility to ensure that the land provided is fit for purpose/suitable). Walker have currently proposed a 1-hectare site near the junction of Legoe Road and Carmelo Road – this location is approximately 4.5km inland from the intake pump station on Chapman Creek (the site can be greater if required).

2.3 We have not considered the potential shared use by Perpetual (adjoining glasshouse site) of any energy supplies – if required, a third-party agreement or the like can be entered into later.

2.4 We assume the existing substation near the development can adequately service the whole development. Further upgrades to this substation are outside the scope of this report.

2.5 The saltwater lake system will be handed back to Council at some point in the future, so consideration needs to be given to the Council's long-term goals. Council will also own the public lights and sporting facilities' lighting too.

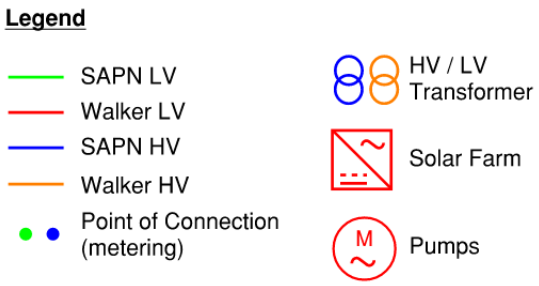
2.6 Walker will retain ownership of the Suburban Activity Centre (and potentially the shopping centre).

3. ASSESSMENT OF POTENTIAL SOLUTIONS

3.1 Pump Station

3.1.1 This section considers options for the design and construction of a solar farm to supply a 400kW pump station for example. Considering a 400kW load running for 10 hours per day between 7:00am and 5:00pm, we have developed a high-level model to determine the size of a solar farm that will meet most of the pumping load whilst minimising low solar exports. A 650kW solar farm will supply approximately 65% of the pumping load (valued at around 24c/kWh) whilst keeping exports (valued at around 5c/kWh) at under 20%.

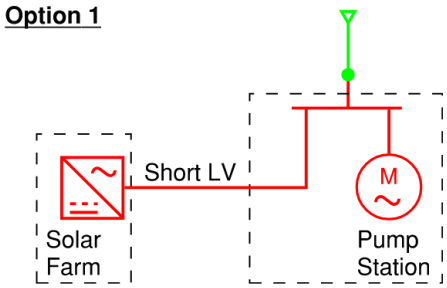
3.1.2 The best economic outcome will always be achieved when connecting the solar farm behind the meter, as it allows the solar to service the load before exporting to the grid thus avoiding SA Power Networks, AEMO and renewable energy charges. Three options are presented below, considering land availability, connecting in front of or behind the meter, and technical feasibility. A high-level economic assessment is provided in section 4 below. Appendix A provides a high-level description of behind the meter and front of meter solar configurations.



3.2 Option 1 – Low Voltage Behind the Meter Connection to the Pump Station

3.2.1 Typically, a low voltage, behind the meter connection would be recommended as the simplest and most effective configuration for a project of this size and nature. A behind the meter connection offers the best economic outcome, and the low voltage connection is relatively simple to build, operate and maintain. However, due to the low voltage (and high current) connection, the solar farm needs to be located immediately adjacent to the pump station. This may present an issue for this project where land availability and suitability are limited.

3.2.2 A diagram and list of advantages and disadvantages for this option are shown below.

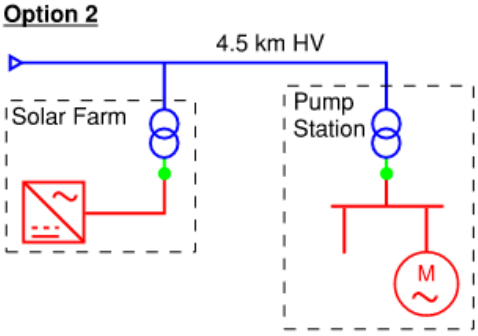


Advantages	Disadvantages
Behind the meter connection offers the best economic benefit	Plot of land must be located directly adjacent to pump station due to the large currents associated with low voltage
Connects directly to pump station switchboard	Increased cable cost due to higher current requirements
No upfront costs for additional HV plant such as step-up transformers	
Relatively simple ongoing operation and maintenance requirements	
SAPN remain responsible for the connection to the pump station	

3.3 Option 2 – Low Voltage In-Front of Meter Connection

3.3.1 Option 2 considers a low voltage connection with the solar farm located on an available plot of land approximately 4.5 km from the pump station. As an LV connection would not be possible over that distance, so it would need to connect to the SAPN HV network in front of the (pump station) meter. As the generated power is being exported to the network before servicing the pump load, it incurs network charges and reduces the economic benefit of this configuration. This configuration assumes that there will be a SAPN HV feeder running close to the location of the solar farm.

3.3.2 A diagram and list of advantages and disadvantages for this option are shown below.



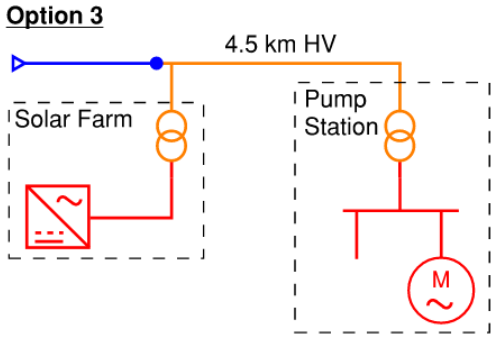
Advantages	Disadvantages
Standard LV connection to SAPN network	Reduced economic benefit due to an in-front of meter configuration incurring network charges
Plot of land readily available	
No upfront costs for additional HV plant such as step-up transformers	
Relatively simple ongoing operation and maintenance requirements	
SAPN remain responsible for the connection to the pump station	

3.4 Option 3 – High Voltage Behind the Meter Connection

3.4.1 Option 3 considers a bulk supply high voltage connection to the SAPN distribution network at the solar farm. Behind this connection, Walker would construct, own and operate a HV network consisting of a HV cable, step-up transformers, and ring main unit, to which both the solar farm and pump station are connected. This achieves a behind the meter connection and allows the solar farm to be located remotely, but introduces additional construction, operation, and maintenance costs. Additionally, a licence may be required to own and operate a HV asset in a public space.

3.4.2 Note that the additional design, procurement, and construction costs of the HV assets are significant. However, this may be partly offset by the cost saving on not requiring SAPN to construct a HV feed to the pump station.

3.4.3 A diagram and list of advantages and disadvantages for this option are shown below.



Advantages	Disadvantages
Behind the meter connection offers the best economic benefit	Additional upfront and ongoing operation and maintenance costs associated with HV plant
Plot of land readily available	Operating HV assets in public spaces requires a licence

SAPN only responsible for supply to connection point. If HV cable faults, pumps could be left without power

3.5 Power Purchase Agreement or Similar

3.5.1 An alternate option to installing solar PV to offset pumping costs would be to source a renewable supply through a retailer in the form of a Power Purchase Agreement (PPA). Retailers such as Flow Power can offer PPAs over a range of terms, from 3 to 15 years for customers with smaller loads (under 30MW) that would normally not be considered viable for a PPA with a larger retailer. A range of risk profiles are available when structuring a PPA such as:

3.5.1.1 blending wind and solar to better match the load profile;

3.5.1.2 exposure to the spot (wholesale) market for any energy not served by the PPA (e.g. when there is no solar or wind supply, any load is charged at the 5-minute spot price);

3.5.1.3 purchasing a financial hedge such as a swap to cover any load not served through solar and/or wind; and

3.5.1.4 full coverage of load through a fixed price.

3.5.2 The lower the risk exposure, the higher the price offered, such that fully hedged PPAs would likely be comparable or more expensive than a standard retail contract.

3.6 Other Council Assets

3.6.1 Solar and/or battery systems can be constructed on the roof of other assets such as the Suburban Activity Centre and shopping centre. It is recommended that these are considered separately to the pump station, connected behind the meter, and sized according to the expected load and load profile of the buildings to which they are to be installed on to offset as much of the load as possible. Enerven can assist with the sizing, design and construction of these systems.

3.6.2 For buildings such as the shopping centre, an embedded network might be considered to offer the best benefit to the owner and tenants.

3.7 Embedded Network

3.7.1 The entire suburb could be configured as an embedded network. This would allow one larger solar farm to service the various council loads (pump station, activity centres, shopping centres, EV chargers, public lighting, etc.) whilst remaining behind the meter, as the meter is located at a single SAPN HV connection point. Generally, embedded networks are usually on the scale of an apartment building or retirement village, however, they can be applied on the scale of a suburb.

3.7.2 This option would demand significant early planning and ongoing operation, maintenance and management requirements. The cost associated with establishing the suburb as an embedded network would exceed any financial benefits provided by this configuration.

3.8 Lease Roof / Land for VPP / Aggregated Portfolio Operator

It is possible to partner with an operator (such as CEP.Energy) to lease roof and other commercial space and allow them to develop and operate clean energy and storage assets across an aggregated portfolio to offer mutual benefits.

4. SUMMARY OF OPTIONS

4.1 High-level economic assessment of pump station options

Please note the costs provided below are non-binding/indicative only and are based on the limited information available to us at the time of preparing this report – they are provided for general guidance only.

The scenarios detailed below cover 175kW, 200kW and 250kW loads in addition to annual energy savings from 1 x 170kW, 1.5 x 170kW and 2 x 170kW loads based on Option 3.

Options below based on 2 x 175kW load			
Considerations	Option One	Option Two	Option Three
Electricity Infrastructure Required	580kW Ground Mounted Solar PV – **Behind the meter**[1] (only possible if close to pumping station)	580kW Ground Mounted Solar PV – In **Front of meter** (~4km from pumping station – connected to SAPN HV feeder)	580kW Ground Mounted Solar PV – **Behind the meter** (using high volage cables ~4km from pumping station)
Upfront Costs	Approx $1,015,000	Approx $1,015,000	Approx $1,895,000
Total Energy Consumed by Pumps	838 MWh	838 MWh	838 MWh
Total Energy Generated	1,073 MWh	1,073 MWh	1,073 MWh
Total Energy Exported	236 MWh	236 MWh	236 MWh
Electricity Cost off Set by Solar	23.85c/kWh	15c/kWh	23.85c/kWh
Annual Reduction in Electricity Costs	$212,000	$132,000	$212,000
Ongoing Costs – Maintenance, Repairs and Replacement	$8,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance	$8,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance	$13,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance • HV TF checks • HV RMU checks
Life Expectancy	• Standard • Panels 25 years • Inverter 10 years (Likely less than standard warranty given salinity of environment)	• Standard • Panels 25 years • Inverter 10 years	• Standard • Panels 25 years • Inverter 10 years

[1] *See Appendix A for explanation of Behind the Meter vs Front of Meter*

Options below based on 2 x 200kW load			
Considerations	Option One	Option Two	Option Three
Electricity Infrastructure Required	650kW Ground Mounted Solar PV – **Behind the meter**[2] (only possible if close to pumping station)	650kW Ground Mounted Solar PV – In **Front of meter** (~4km from pumping station – connected to SAPN HV feeder)	650kW Ground Mounted Solar PV – **Behind the meter** (using high volage cables ~4km from pumping station)
Upfront Costs	Approx $1,137,500	Approx $1,137,500	Approx $2,017,500
Total Energy Consumed by Pumps	950 MWh	950 MWh	950 MWh
Total Energy Generated	1,204 MWh	1,204 MWh	1,204 MWh
Total Energy Exported	254 MWh	254 MWh	254 MWh
Electricity Cost off Set by Solar	23.85c/kWh	15c/kWh	23.85c/kWh
Annual Reduction in Electricity Costs	$240,000	$150,000	$240,000
Ongoing Costs – Maintenance, Repairs and Replacement	$8,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance	$8,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance	$13,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance • HV TF checks • HV RMU checks
Life Expectancy	• Standard • Panels 25 years • Inverter 10 years (Likely less than standard warranty given salinity of environment)	• Standard • Panels 25 years • Inverter 10 years	• Standard • Panels 25 years • Inverter 10 years

[2] *See Appendix A for explanation of Behind the Meter vs Front of Meter*

Options below based on 2 x 250kW load			
Considerations	Option One	Option Two	Option Three
Electricity Infrastructure Required	800kW Ground Mounted Solar PV – **Behind the meter**[3] (only possible if close to pumping station)	800kW Ground Mounted Solar PV – In **Front of meter** (~4km from pumping station – connected to SAPN HV feeder)	800kW Ground Mounted Solar PV – **Behind the meter** (using high volage cables ~4km from pumping station)
Upfront Costs	Approx $1,540,500	Approx $1,540,500	Approx $2,420,500
Total Energy Consumed by Pumps	1,180 MWh	1,180 MWh	1,180 MWh
Total Energy Generated	1,481 MWh	1,481 MWh	1,481 MWh
Total Energy Exported	302 MWh	302 MWh	302 MWh
Electricity Cost off Set by Solar	23.85c/kWh	15c/kWh	23.85c/kWh
Annual Reduction in Electricity Costs	$298,000	$186,000	$298,000
Ongoing Costs – Maintenance, Repairs and Replacement	$8,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance	$8,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance	$13,000 (excluding corrective actions) • Vegetation maintenance • Module cleaning • Thermography • Corrective maintenance • HV TF checks • HV RMU checks
Life Expectancy	• Standard • Panels 25 years • Inverter 10 years (Likely less than standard warranty given salinity of environment)	• Standard • Panels 25 years • Inverter 10 years	• Standard • Panels 25 years • Inverter 10 years

[3] *See Appendix A for explanation of Behind the Meter vs Front of Meter*

Please note, the analysis below provides an annual comparison of energy savings based on 3 different loads with the primary difference being the amount of solar energy consumed, solar energy exported, and grid energy imported. As it is difficult to predict electricity prices beyond 3 years, we have not attempted to forecast outcomes based on 4-yearly load changes, but rather provided an annual comparison using the same pricing to better illustrate the differences in savings considering load size.

Reduction in Energy Costs for 1 x 170kW, 1.5 x 170kW and 2 x 170kW Load – Option 3			
Considerations	1 x 170kW load	1.5 x 170kW load	2 x 170kW load
Electricity Infrastructure Required	580kW Ground Mounted Solar PV – **Behind the meter** (using high volage cables ~4km from pumping station)		
Upfront Costs	Approx. $1,895,000		
Total Energy Consumed by Pumps	483 MWh	674 MWh	824 MWh
Total Energy Generated	1,074 MWh	1,074 MWh	1,074 MWh
Total Energy Exported	591 MWh	400 MWh	250 MWh
Electricity Cost off Set by Solar	23.85c/kWh		
Annual Reduction in Electricity Costs	**$122,000**	**$170,000**	**$208,000**

4.2 Cost related assumptions:

4.2.1 Pumping load running from 7am to 5pm (10 hours) 365 days per year;

4.2.2 650kW ground mounted solar covering 65% of load (exporting approx. 20% of generation);

4.2.3 Cost of ground mounted solar at $1.75/watt;

4.2.4 Electricity commodity price of 15c/kWh using ASX energy;

4.2.5 Network consumption charges of 6.85c/kWh (SA Power Networks Large Business – Annual Demand Tariff);

4.2.6 AEMO and Ancillary Charges 2c/kWh;

4.2.7 Solar Export (Feed in) 5c/kWh; and

4.2.8 Upfront costs are indicative only.

5. FURTHER DISCUSSIONS

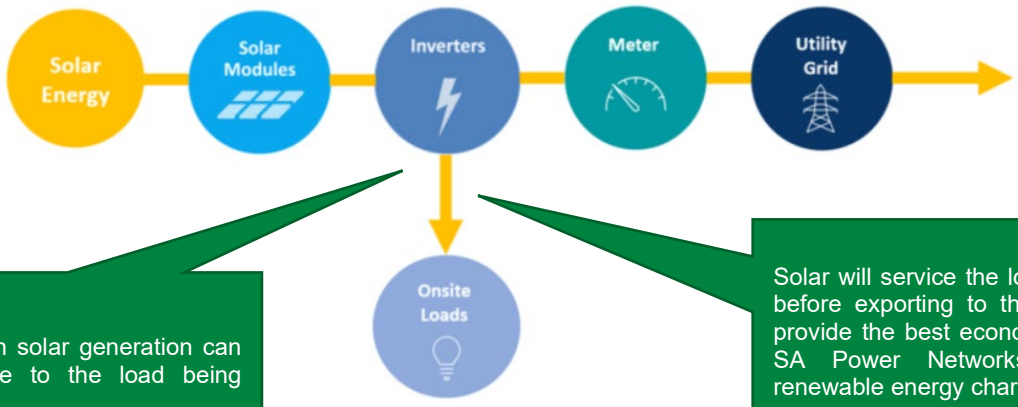
5.1 As discussed throughout this report, there are a few different options available to Walker, each with its own set of considerations. Once you have had an opportunity to review them with your team, we are more than happy to have a further discussion with you to provide more context around the proposed solutions and how we can further assist.

5.2 As you know, Enerven are an EPC contractor who can deal with the engineering design, DNSP applications (as required), construction of the infrastructure, arranging the connections and commissioning the solar farm and any related assets (if applicable).

5.3 Once you have a clearer idea on which solution you wish to pursue, we can provide a firmer position on pricing, timeline and the most suitable delivery model.

APPENDIX A –
BEHIND THE METER VS FRONT OF METER

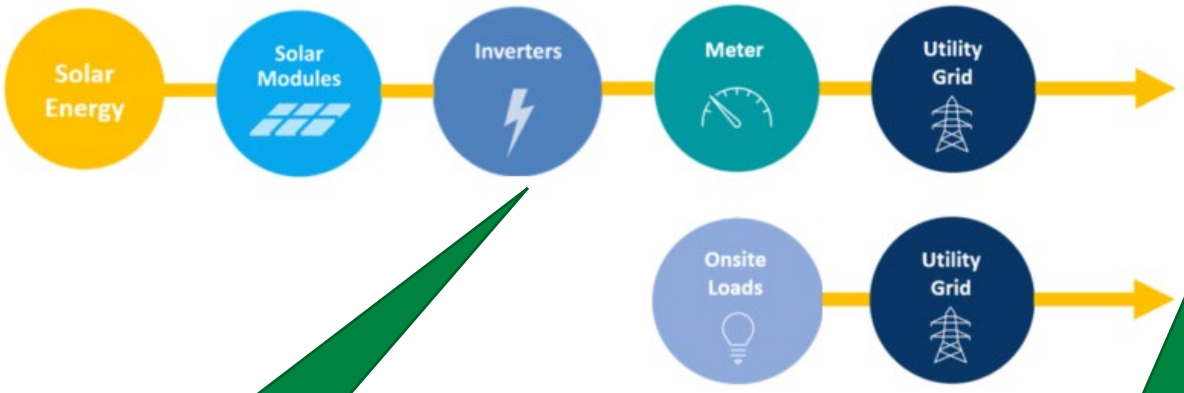
Behind the Meter



Works best when solar generation can be located close to the load being serviced

Solar will service the load (e.g. pumps) before exporting to the grid. This will provide the best economic outcome as SA Power Networks, AEMO and renewable energy charges are avoided.

Front of Meter



Works best when solar cannot be located close to load thus avoiding high cost of high voltage cable connection over long distances

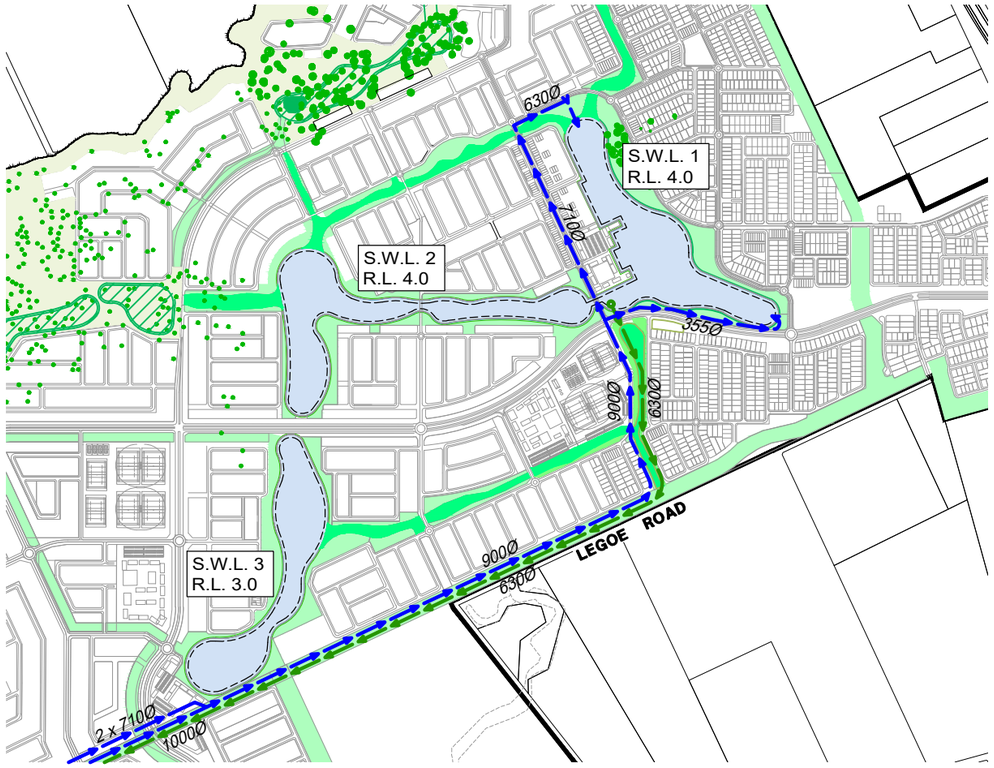
Solar generation is “virtually” netted off consumption and requires a more complex contracting structure for electricity supply. Also does not avoid networks and other costs.

ENERVEN™

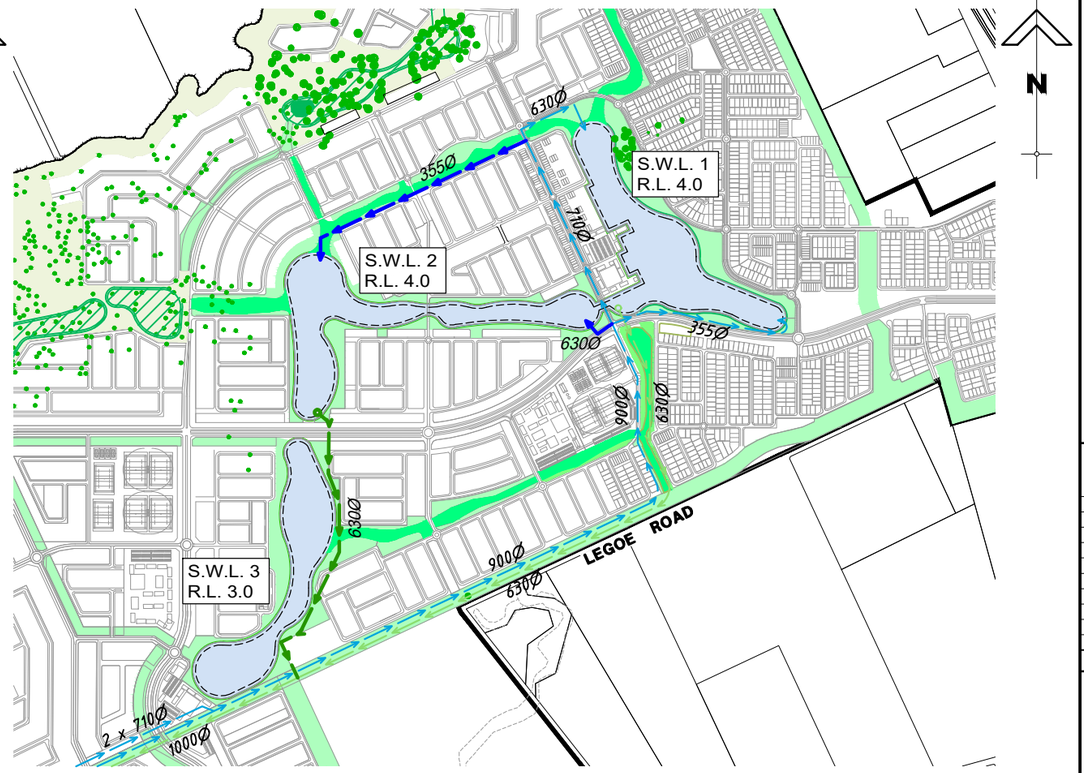
1300 334 523
enquiries@enerven.com.au
enerven.com.au

Appendix I

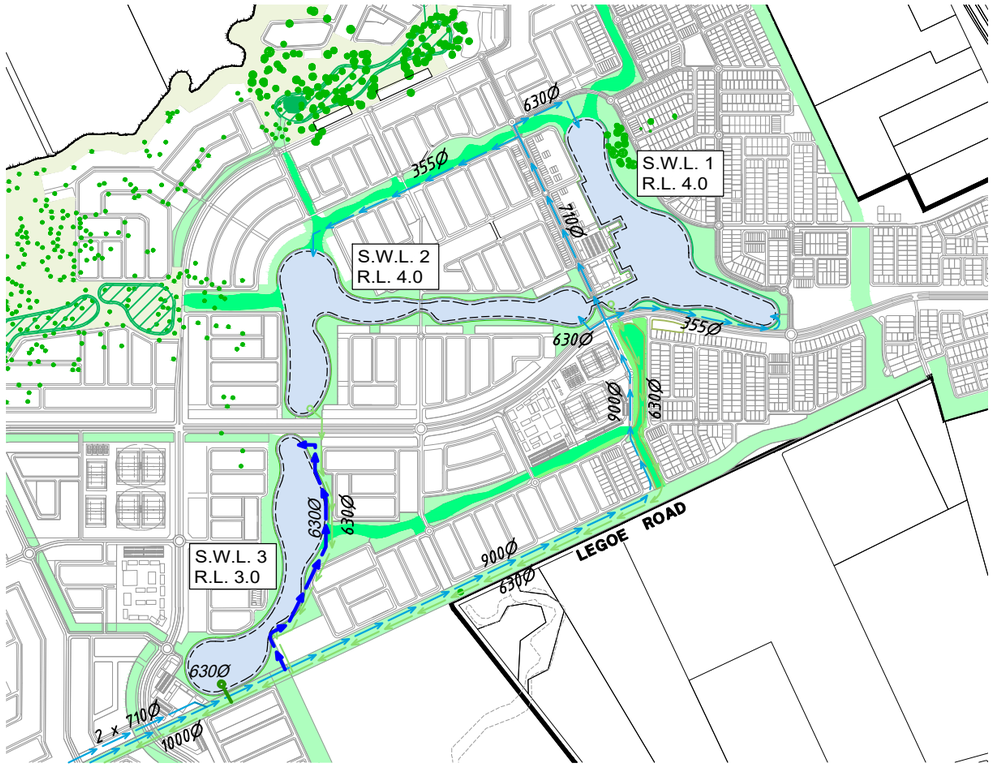
Conceptual Lake Circulation System Phasing Plans.



PHASE 1 - SWL 1 CIRCULATION



PHASE 2 - SWL 1 & 2 CIRCULATION



PHASE 3 - SWL 1, 2 & 3 CIRCULATION

THIS DRAWING HAS BEEN PREPARED FOR PRELIMINARY PLANNING AND DISCUSSION PURPOSES ONLY, AND IS SUBJECT TO SURVEY, GEOTECHNICAL INVESTIGATION, AUTHORITY APPROVALS AND DETAILED DESIGN.

SCALE 100 0 100 200 300 400 500 (metres)
1 : 10000 (FULL SIZE)

RIVERLEA DEVELOPMENT

PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
C	SWL 3 INTAKE PIPE DIA AMENDED	13-10-22
B	CONCEPT MASTERPLAN UPDATED	01-08-22
A	ORIGINAL ISSUE	07-06-22

BURCHILLS ENGINEERING SOLUTIONS

Level 2, Connaught Centre
26 Marine Parade, Southport QLD 4215
PO Box 3766, Australia Fair, Southport QLD 4215
Phone: +61 7 5509 6400
Fax: +61 7 5509 6411
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL

DRAWING TITLE :

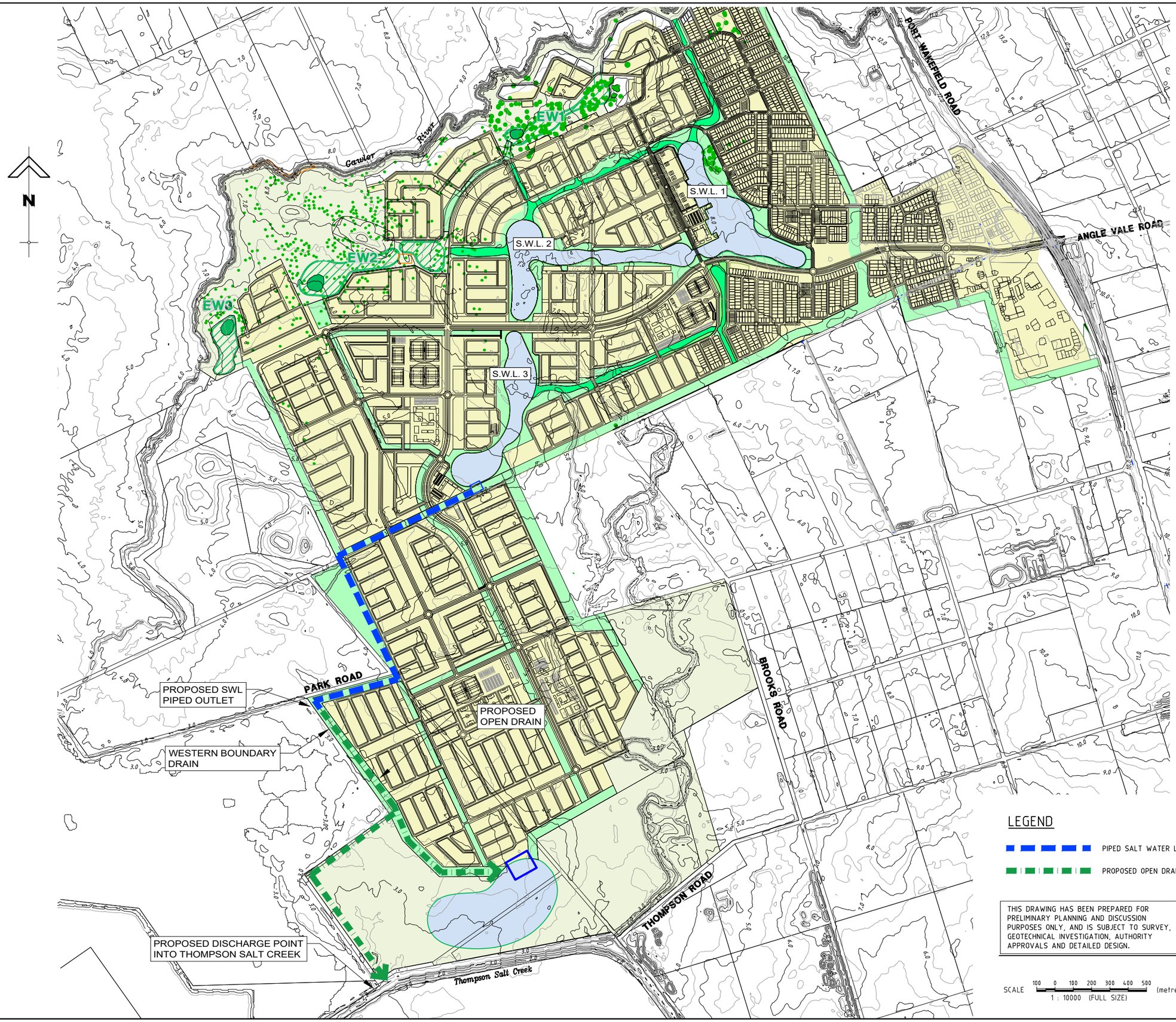
CONCEPTUAL LAKE CIRCULATION SYSTEM PHASING PLANS

DEVEL. APPLIC. No. : -	DATE : 13-10-22
PROJECT LEADER : PAUL KELLY	
DESIGNER : ADAM COOPER	
DRAFTSPERSON : ADAM COOPER	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	
SCALE : AS NOTED	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE170039	DRAWING No. : SK138 / VERSION: C

FILENAME I:\Projects\2017\BE170039_Riverlea_Development\Civil\AutoCAD\Sketch\BE170039-SK138.dwg
PLOTTED 13.10.2022 at 12:46

Appendix J

Saltwater Lakes Outlet Plan.



RIVERLEA DEVELOPMENT

PROPOSED DEVELOPMENT AT BUCKLAND PARK SOUTH AUSTRALIA

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
A	ORIGINAL ISSUE	01-08-22

BURCHILLS ENGINEERING SOLUTIONS

Level 2, Connaught Centre
26 Marine Parade, Southport QLD 4215
PO Box 3766, Australia Fair, Southport QLD 4215
Phone: +61 7 5509 6400
Fax: +61 7 5509 6411
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:

GENERAL SITE EARTHWORKS PRE-DESIGN AND CONCEPTUAL

DRAWING TITLE :

SALT WATER LAKES OUTLET PLAN

DEVEL. APPLIC. No. : -	DATE : 10-08-22
PROJECT LEADER : PAUL KELLY	
DESIGNER : ADAM COOPER	
DRAFTSPERSON : ADAM COOPER	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	

SCALE : AS NOTED	DATUM : AHD	FULL SIZE : A1

PROJECT No.:	DRAWING No. :	VERSION:
BE170039	SK147	A

PLOTTED 18.08.2022 at 11:08
FILENAME: I:\Projects\2017\BE170039_Riverlea_Development\Civil\Acad\Sketch\BE170039_SK147.dwg

Appendix K

Native Vegetation Council – Approval.

Native Vegetation Council
81-95 Waymouth St, ADELAIDE SA 5000 | GPO Box 1047, ADELAIDE SA 5001
Ph| 08 8303 9777; email| nvc@sa.gov.au

DECISION NOTIFICATION
Native Vegetation Regulations 2017

Application Number: 2022/3075/292

To: Attention: Patrick Mitchell
Principal Planner
Walker Corporation
PO Box 3665 Rundle Mall
Adelaide SA 5000
Mobile: 0420 472 293 Email: Patrick.Mitchell@walkercorp.com.au

Date Received: 16/03/2022
Date Registered: 30/03/2022

Applicant	Walker Buckland Park Developments Pty Ltd
Landholder	Lot 624 Legoe Rd (CR 5757/317) – Crown Land Legoe Rd road reserve – managed by City of Playford
Purpose of application	Clearance is required for the construction of an intake pipeline to transport saline water as part of a revised stormwater mitigation strategy for the Riverlea major development at Riverlea Park, within the City of Playford.
Description of native vegetation under application	**1.25 ha** native vegetation that includes the following vegetation associations: • 0.42 ha *Tecticornia* sp. (Samphire) shrubland over *Disphyma crassifolium* ssp. *clavellatum* (Round-leaf Pigface) • 0.14 ha *Avicennia marina* ssp. *marina* (Mangroves) • 0.34 ha *Duma florulenta* (Lignum) Shrubland over *Tecticornia* sp. (Samphire) with emergent *Eucalyptus camaldulensis* ssp. *camaldulensis* (River Red Gum) • 0.35 ha *Duma florulenta* (Lignum) Shrubland over *Tecticornia* sp. (Samphire) riparian system plus • **6 x** *Eucalyptus camaldulensis* ssp. *camaldulensis* (River Red Gum) trees
Location of the application	Local Government Area: City of Playford Hundred of Port Adelaide H105800 S624 CR5757/317 Legoe Rd road reserve Location: Lot 624 Legoe Road, Buckland Park SA 5120

Decision

The Native Vegetation Council has considered your application in accordance with the requirements of Regulation 12, Schedule 1; Clause 35 of the *Native Vegetation Regulations 2017*.

Government of South Australia

In respect of the application, you are informed that the Native Vegetation Council:

1. **Grants consent** to the clearance of 6 x *Eucalyptus camaldulensis* (Red Gum) trees plus 1.25 ha native vegetation, in the area shown on the attached Decision Plan 2022/3075/292 required for the construction of an intake pipeline to transport saline water as part of a revised stormwater mitigation strategy for the Riverlea major development at Riverlea Park, within the City of Playford.

Reason for Decision:

The clearance of native vegetation meets the requirements of Native Vegetation Regulation 12, Schedule 1; Clause 35.

Conditions of approval

This approval is subject to the conditions specified below have been imposed to ensure that the impacts on native vegetation and biodiversity from approved clearance is adequately minimised and mitigated:

1. No clearance to occur until Development Approval has been obtained under the *Planning, Development and Infrastructure Act 2016* for the development.
2. Clearance to be confined to the native vegetation as shown on the attached Decision Plan 2022/3075/292 and in the submitted Data Report: *Native Vegetation Clearance, Buckland Park Intake Pipeline*, prepared by Hayley Merigot, dated 16/03/22;
3. Prior to clearance commencing, the applicant must advise all persons undertaking the vegetation removal or working on site, of all relevant conditions of approval and associated statutory requirements;
4. Prior to clearance commencing, the applicant must define the trees and vegetation approved for clearance with markings, barriers, pegs, flags or temporary fencing. The markings, barriers, pegs, flags or temporary fencing must remain in place, in good condition and clearly visible, for the period in which clearance is occurring;
5. Infrastructure construction is undertaken in a way that machinery, vehicle movement and material laydown areas are restricted to the approved clearance area, existing tracks or areas devoid of native vegetation;
6. Any excavation or fill material surplus to the requirements of the development must be disposed of such that it will not:
    - adversely impact on native vegetation;
    - contribute to erosion or sedimentation;
    - facilitate the spread of pest plant and pathogenic material;
7. Any hollows in trees approved for clearance are to be retained if possible and relocated to a nearby suitable area, either on the ground or attached to the limbs of healthy trees remaining on the property. Hollow limbs are to be a minimum of 50 cm long and if placed in trees, at optimum height (>4m) and orientation;
8. The Significant Environmental Benefit requirement (equivalent to 113.07 SEB points) is to be achieved by making a payment of $65,299.54 ($61,910.00 – GST exclusive - for clearance and $3,389.54 for administration – GST inclusive) to the Native Vegetation Fund, and is to be made within one month of invoice date. (Note the invoice will be sent once the attached form 'Decision Notification acknowledgement' is signed and returned);

9. Members of the NVC or a person who is an authorised officer under the Act may at a reasonable time enter the property of the landowner for the purpose of assessing and recording any matter relevant to this consent. A person undertaking such an assessment may be assisted by other suitable persons. Any such inspection will only be taken after there has been an attempt to contact the landowner;
10. Non-compliance with any of the conditions of this approval must be reported to the Native Vegetation Council as soon as practicable after the non-compliance being detected, but must be within a maximum of seven days. The report must include details of the nature of the breach, the location and extent of the breach and the actions taken and associated timing for completion of those actions, to address the breach;
11. No clearance is to occur until the attached form, "Decision Notification Acknowledgement", is signed and returned to confirm that the applicant and anyone else who is a party to the agreement, understand and will comply with the decision, including all the associated conditions;
12. The applicant must adequately inform any prospective purchaser, lessee or occupier of the land affected by conditions in this consent, of the relevant conditions;

Expiry date of approval

The approval to clear native vegetation in accordance with this decision ceases after 2 years from the decision date.

Signature	
Name	Vaughan Levitzke PSM
Position	**CHAIR, NATIVE VEGETATION ASSESSMENT PANEL**
Date	19/04/2022 (Decision Date)

Notes

1. **Effect of Consent**
   This Decision Notification grants consent under the *Native Vegetation Act 1991* only and does not imply approval under any other legislation. It is the responsibility of the landowner to obtain all relevant approvals for any proposed development. This includes any approval that might be required in relation to the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*.

2. **Conditions**
   Please note that these conditions are an integral part of the consent and are legally binding under the *Native Vegetation Act 1991* and *Native Vegetation Regulations 2017*. Should **any** clearance occur in accordance with this decision, the conditions are enforceable in full.

   Any conditions of consent are binding on and enforceable against the person granted the approval, any current and future owners of the land, any occupier of the land and any person who acquires the benefit of the clearance.

3. Amended decisions

Where a decision is amended, all previous versions of the decision are null and void.

If an application to amend a decision will substantially alter the nature of the original application or conditions of approval, the Native Vegetation Council may require a new application be submitted.

4. SEB Areas

All areas established as a condition of consent to provide a significant environmental benefit, whether through revegetation, management or protection of an area of native vegetation, are protected in perpetuity under the *Native Vegetation Act 1991*. No clearance of native vegetation within these areas can occur without the consent of the Native Vegetation Council.

5. Monitoring

The Native Vegetation Council undertakes a program of monitoring of conditions attached to any clearance consent. As part of this program, the landowner may be contacted by an officer of Department to arrange inspections. Should it be evident that the conditions have not be applied with in full, the landholder will be informed in writing of the nature of breach of the conditions and given an opportunity to comply with the conditions. However, if the breach of the conditions is substantial, ongoing or irreversibly, then the Council may take compliance actions under Section 31 of the *Native Vegetation Act 1991*.

6. Use of cleared vegetation

Native vegetation authorised for clearance under a Decision Notification may be a useful resource, as a source of seed for local revegetation projects, for woodcraft purposes or providing hollows for relocation. Please consider notifying any local seed collection groups to offer them the opportunity of collecting seed at the time of clearance, and making any timber from the cleared trees available for woodcraft or hollow relocation.

DECISION NOTIFICATION ACKNOWLEDGEMENT

Application Number: **2022/3075/292**

Patrick Mitchell
Principal Planner
Walker Corporation
Installation of an intake pipeline in association with a major development located at Lot 624 Legoe Rd Buckland Park SA 5120 & road reserve

The applicant, and all parties to the decision, have received a copy of the Decision Notification (decision date 19/04/2022) are fully aware and will comply with the decision and all the attached conditions.

Name of applicant: .....

Signature of applicant or seal of Company and authorised signatory, including the signature of any other parties to the decision:

.....

.....

.....

.....

Date: .....

Note: *Sign and return this form by post or email to:*

Send to: **Native Vegetation Branch**
C/o
Department for Environment and Water
GPO Box 1047 Adelaide SA 5001

Email: **sharon.gillam@sa.gov.au**

Government of South Australia
Department for Environment and Water

Native Vegetation Regulation Application
Walker Buckland Park Developments - intake pipeline for Riverlea Park

DECISION PLAN

TO FORM PART OF THE DECISION TO THE NATIVE VEGETATION COUNCIL

APPLICATION NO. 2022/3075/292

HUNDRED of PORT ADELAIDE

Legoe Road road reserve and H105800 S624 CR5757/317

Conditional Consent (6 x scattered trees plus 1.25 ha)

Property/Section Boundary

Road

Produced for: Native Vegetation Council
By: Native Vegetation Branch
Department for Environment and Water

Imagery: Latest_Imagery_ImageMapsSA

Date: 05/04/2022
Version: 01
Datum: GDA94

NVO: SG

Delegate, Native Vegetation Council

Dated: 19/04/2022

Native Vegetation Council

N

Meters
0 330 660 990 1,320 1,650
Scale: 1:21000