



Boyne Tannum Aquatic Recreation Centre Option Analysis

Lot 900 Coronation Drive, Tannum Sands

10 Canoe Point Road, Tannum Sands

Jacaranda Drive, Boyne Island

**PREPARED FOR
GLADSTONE REGIONAL COUNCIL**

REFERENCE NO: R2019066

Making a difference.

Contact Information

Cardno (Qld) Pty Ltd
ABN 57 051 074 992
192 Quay Street
Rockhampton QLD 4701
Australia
www.cardno.com
Phone +61 7 4994 2345
Fax +61 7 4926 1286

Author(s):

Justine Latemore, Planner

Approved By:

Patrick Moore
Central Queensland 2IC

Document Information

Prepared for Gladstone Regional Council
Project Name Boyne Tannum Aquatic
Recreation Centre Options
Analysis
File Reference R2019066.R04.006.docx
Job Reference R2019066
Date 12 May 2020
Version Number 006

Effective Date 12/05/2020

Date Approved 12/05/2020

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
001	23 April 2020	Preliminary Draft for Council Review	Justine Latemore	Stephen Whitaker
002	24 April 2020			
003	29 April 2020			
004	1 May 2020			
005	8 May 2020			Patrick Moore
006	12 May 2020			

© Cardno. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

This document is produced by Cardno solely for the benefit and use by the client in accordance with the terms of the engagement. Cardno does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

Table of Contents

1	Introduction	1
2	Methodology	2
3	Site Introduction	1
4	Site Analysis	4
4.2	Site 1 – Lot 900 Coronation Drive, Tannum Sands	4
4.3	Site 2 – 10 Canoe Point Road, Tannum Sands	5
4.4	Site 3 – Jacaranda Drive, Boyne Island	5
5	Preliminary Master Plan	1
5.2	25 Metre Pool	2
5.3	50 Metre Pool (Future)	2
5.4	Kids Splash Pool	2
5.5	Hydrotherapy/Warm Water Exercise Pool	2
5.6	Waterslide	2
5.7	Swim Club / Meeting Room	3
5.8	Café	3
5.9	Staff Management / First Aid	3
5.10	Supporting Infrastructure	3
6	Options Analysis	4
7	Costings	7
7.1	Construction (Facility)	7
7.2	Construction (Civil Infrastructure)	8
7.3	Operational	8
7.4	Maintenance (Assets)	8
7.5	Cost Exclusions	8
8	Conclusion and Recommendations	9

Appendices

- Appendix A** Preliminary Master Plan
- Appendix B** Site Analysis Reports
- Appendix C** Preliminary Master Plan Overlay
- Appendix D** Site Review Workshop Presentation
- Appendix E** Operating Model and Cost Estimate
- Appendix F** Maintenance Cost Estimate

Tables

Table 4-1	Development Water Loading	4
Table 6-1	Options Analysis	4
Table 7-1	Construction Cost Estimate	7
Table 7-2	Civil Infrastructure Cost Estimate	8

Figures

Figure 2-1	Project Methodology	2
Figure 3-1	Location of Potential Sites	1
Figure 3-2	Site 1	2
Figure 3-3	Site 2	2
Figure 3-4	Site 3	3
Figure 5-1	Preliminary Master Plan	1

1 Introduction

Cardno has been engaged by Gladstone Regional Council ('Council') to complete an options analysis of three (3) potential sites for the future Boyne Tannum Aquatic Recreation Centre ('the aquatic centre').

Cardno has completed a comprehensive analysis of the sites to identify a recommended site that Council can further progress. The recommendation presented by Cardno has been informed by technical assessments prepared as part of the project.

This report discusses the sites options and documents the analytical exercise undertaken to identify a recommended site. The report contains the following chapters:

- > Chapter 2 outlines the methodology employed by Cardno in completing the site analysis, options analysis and recommendation;
- > Chapter 3 describes the three (3) potential sites for the future aquatic centre;
- > Chapter 4 summarises the technical analysis undertaken of each of the three (3) potential sites;
- > Chapter 5 discusses the preliminary master plan prepared for the aquatic centre;
- > Chapter 6 documents the option analysis of the sites and recommends the preferred site;
- > Chapter 7 provides an estimate of costs relating to construction, operations and maintenance; and
- > Chapter 8 provides a conclusion of the work undertaken and provides recommendations and actions for Council.

The report should be read in conjunction with the detailed Site Analysis Reports prepared for each site, which are provided as **Appendix B**.

2 Methodology

Figure 2-1 describes the methodology employed by Cardno in completing the project to recommend a preferred site option to Council.

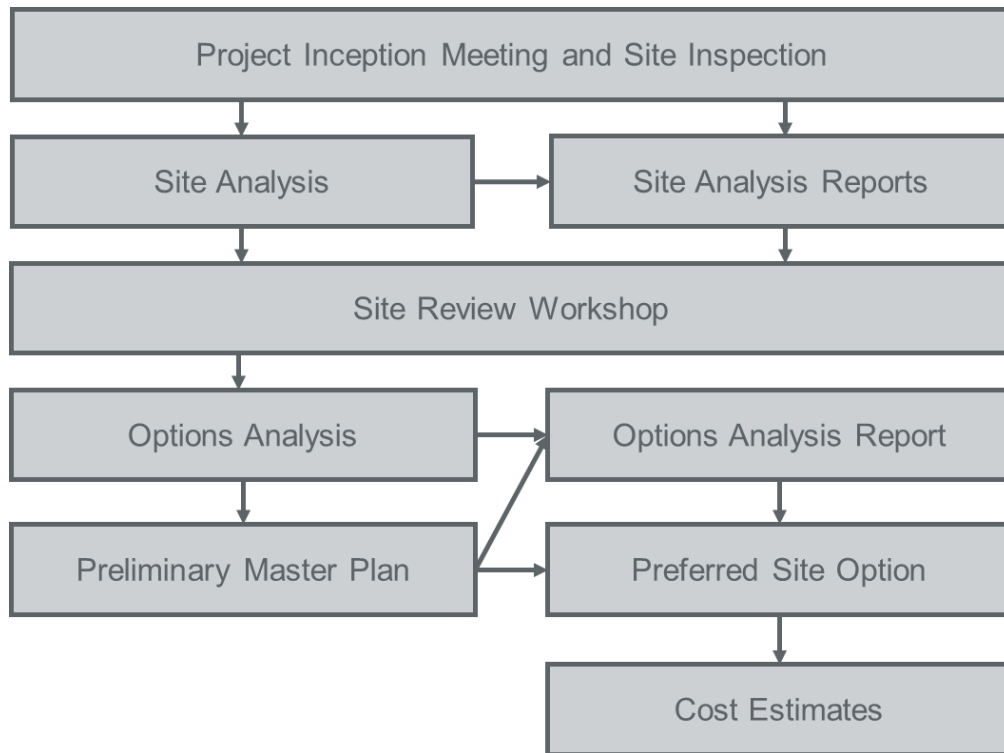


Figure 2-1 Project Methodology

As outlined in Figure 2-1, the methodology employed by Cardno included the following key activities:

- > A project inception meeting and site inspection held between Council and Cardno on 10 October 2019.
- > A detailed site analysis documented in Site Analysis Reports, which is further discussed in Chapter 4 of this report.
- > A site review workshop held between Council and Cardno on 16 January 2020. It is important to note that at this workshop the methodology of the project was refined to reflect the findings of the Site Analysis. The presentation made by Cardno at this workshop is included as **Appendix D**.
- > An options analysis documented in this Options Analysis Report, specifically in Chapter 6.
- > The selection of a preferred site option based on the options analysis, as discussed in Chapter 6.
- > The preparation of a preliminary master plan and cost estimates, as discussed in Chapters 5 and 7 of this report.

3 Site Introduction

The following three (3) sites within the Gladstone local government area were identified as potential options for the future Boyne Tannum Aquatic Recreation Centre:

- > **Site 1** located at Lot 900 Coronation Drive, Tannum Sands and more properly described as Lot 900 on SP152499. Site 1 has a land area of 99,250m² and is shown in Figure 3-2.
- > **Site 2** located at 10 Canoe Point, Tannum Sands and more properly described as Lot 51 on CTN1818. Site 2 has a land area of 84,630m² and is shown in Figure 3-3.
- > **Site 3** located at Jacaranda Drive, Boyne Island and more properly described as Lot 10 on SP171136. Site 2 has a land area of 54,830m² and is show in Figure 3-4.

The location and proximity of all three (3) sites is shown in Figure 3-1.

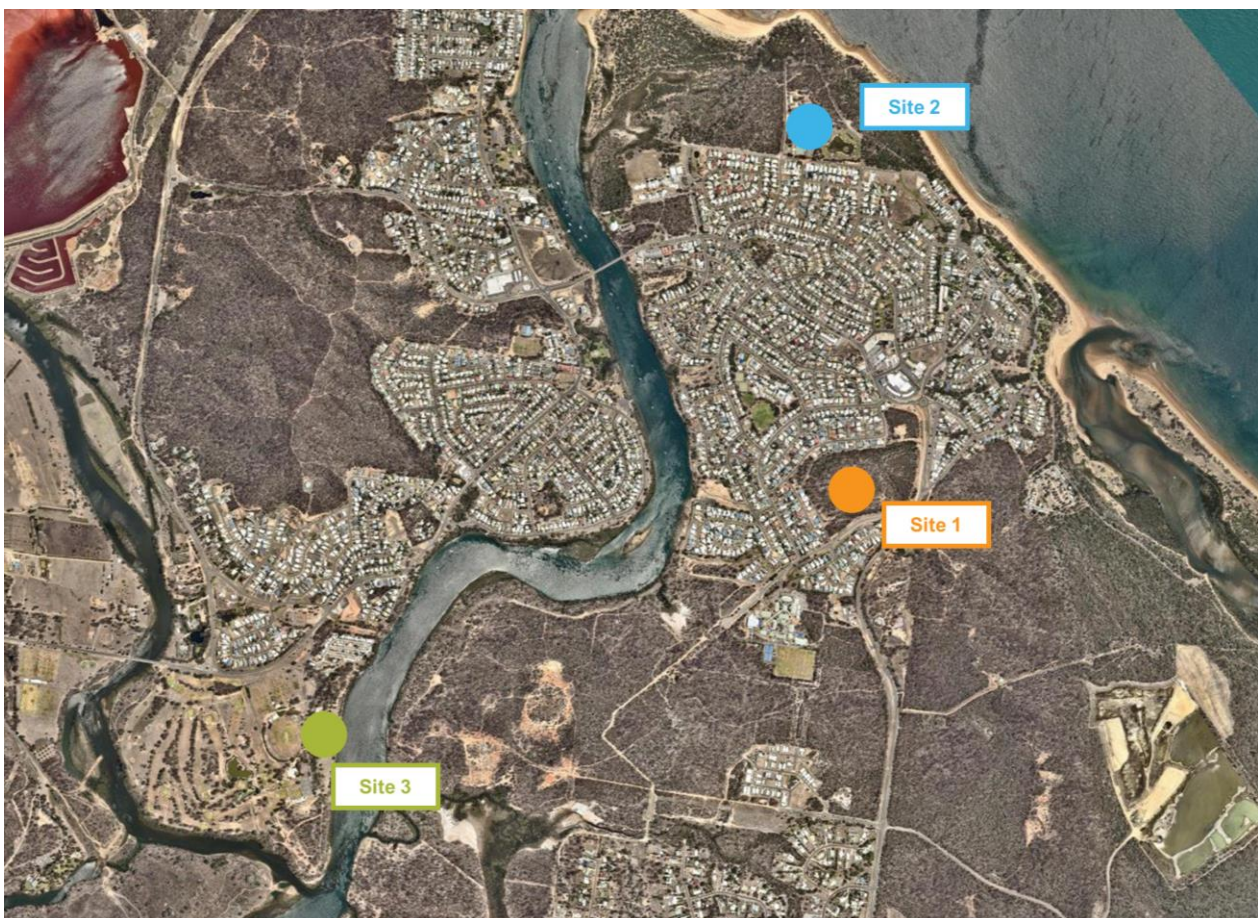


Figure 3-1 Location of Potential Sites

Council has engaged Cardno to prepare a detailed technical analysis of each site to determine relevant considerations for the establishment of an aquatic centre. A summary of the findings of the technical analysis is provided in Chapter 4.



Figure 3-2 Site 1



Figure 3-3 Site 2



Figure 3-4 Site 3

4 Site Analysis

Detailed technical assessments of each potential site have been undertaken by Cardno to identify, opportunities, constraints, infrastructure requirements, design parameters and overall suitability for an aquatic centre.

The technical analysis completed for each site is documented in a Site Analysis Report prepared for each site. A copy of each of the three reports prepared is included in **Appendix B – Site Analysis Reports**. These Site Analysis Reports should be consulted for the findings of the comprehensive analysis completed. The discussion provided in this chapter represents a summary of the technical site analysis completed to inform the options analysis.

The site analysis completed included the following technical reviews:

- > town planning review;
- > civil engineering review;
- > environmental review;
- > traffic engineering review; and
- > geotechnical engineering review.

The following site analysis findings are relevant to each site:

- > The defined land uses of Outdoor Sport and Recreation and Indoor Sport and Recreation under the *Our Place Our Plan Gladstone Regional Council Planning Scheme Version 2* ('the planning scheme') were identified as relevant to aquatic centre development.
- > In the determination of internal water main sizing and any potential external water main upgrades the development area for the aquatic centre was assumed to be 1.5 hectares and the number of equivalent persons (EP) for the site was determined in accordance with CMDG as shown in Table 4-1.

Table 4-1 Development Water Loading

Area (ha) ^{Note 1}	Assumed loading (EP/ha) ^{Note 2}	Development EP	Assumed Loading (L/EP/day) ^{Note 2}	Average day demand (kL/day)
1.5	56	~ 84	558	46.9

Note 1: Allotment area only – excludes road reserve, balance of land titles, open space etc. Area is approximate.

Note 2: cmdg.com.au, D11 Water Supply Network.

- > From a review of the planning scheme car parking rates and review of similar facilities across Queensland including the Gladstone Aquatic Centre the recommended car parking supply was derived to be between 82 and 103 spaces.

4.2 Site 1 – Lot 900 Coronation Drive, Tannum Sands

Site 1 is currently unimproved and is located in the Emerging Community Zone under the planning scheme. This zone identifies land that is intended for future urban development. A development application will be required to be made to Gladstone Regional Council seeking a Development Permit for a Material Change of Use. Dependent on the applicable land use, the required development application will be either Assessable Development that is subject to Code Assessment (where involving Outdoor Sport and Recreation) or Assessable Development that is subject to Impact Assessment (where involving Indoor Sport and Recreation). Where the proposed development involves both uses, it will be subject to the highest category of assessment and therefore be Assessable Development that is subject to Impact Assessment. This development application may be required to be referred to the Department of State Development, Manufacturing, Infrastructure and Planning.

The site has frontage to Coronation Drive (an Urban Distributor road) to the south which intersects with Tannum Sands Road (a state Controlled Road) to the east. It is considered that the site has suitable access available from Coronation Drive (available sight distance) and there is available capacity in the surrounding local and regional road network for the development of the site. No intersection modelling has been completed and may be required as part of future investigations. The higher order active transport path on Tannum Sands Road provides a simple connection to the site. The location is proximate to existing bus routes and stops as well as a shopping centre, primary school and high school. It is considered that an

acoustic and lighting impact assessment may need to be undertaken to determine the impacts of the development on the surrounding residential properties/

The site is effected by Category B regulated vegetation which is likely to be able to be cleared as exempt clearing work. The site also contains a mapped waterway in the north that is likely to be avoided in the development of the site. There is potential impact on essential habitat mapped over the site, requiring assessment.

The site is anticipated to have sufficient water capacity with a connection to be provided to an existing 200mm water main on Coronation Drive. There is no existing sewerage infrastructure within the site and depending on the final connection point to the surrounding network there will be a need to upgrade the downstream gravity mains. Geotechnical investigations demonstrate the potential for weathered rock within the site and where deeper excavation is required it would be better suited to the western edge of the site. There is potential however low likelihood of acid sulfate soils, as the site is partly above 20 metres AHD.

4.3 Site 2 – 10 Canoe Point Road, Tannum Sands

The site is currently improved with open space including tennis courts, land and community buildings and is commonly known as the Canoe Point Botanic Reserve and the Tanyella Recreation Grounds.

The site is located in the Sport and Recreation Zone, where both the proposed uses are consistent. There is potential for the development to be Accepted Development if limited to Outdoor Sport and Recreation, complying with requirements and avoiding select overlays. Accepted Development does not require a development application. In all other instances a development application subject to Code Assessment will be required to be made to Gladstone Regional Council seeking a Development Permit for a Material Change of Use.

The site has frontage to Canoe Point Road to the west and The Oaks road to the south. It is considered that the site has suitable access from The Oaks Road (available sight distance) as well as access through lower order roads in the surrounding residential area to the south, connecting to higher order roads. The location is proximate to an existing bus route on Booth Avenue to the south and existing cycle paths associated with the beach corridor.

The site contains Category B, R and X vegetation and due to land tenure an Operational Works approval for vegetation clearing and a Section 22A determination is likely required. The eastern portion of the site is heavily constrained by ecology and coastal processes as a result of its proximity to the beach and a fauna assessment will be required to assess any impacts on animal breeding places.

The site requires the upgrade of the existing 80mm water main to a 150mm pipe as well as an upgrade to 150 metres of main in Caledon Street from 100mm to 150mm. Geotechnical investigations show the potential for weathered rock below 1.5 metres and potential acid sulfate soils due to the proximity of the site to the coastal environment.

4.4 Site 3 – Jacaranda Drive, Boyne Island

Site 3 has previously been used for Council infrastructure but is currently unimproved. The site is adjacent to an established sporting precinct to the east and a caravan park to the north.

The site is located within the Low Density Residential Zone within which residential land uses (primarily houses) are intended to be located. A development application will be required to be made to Gladstone Regional Council seeking a Development Permit for a Material Change of Use that is subject to Impact Assessment (public notification required).

The site has road frontage to Jacaranda Drive to the west which intersects with Malpas Street to the north. Access to the site is available from Jacaranda Drive (available sight distance) although would be constrained by an existing drainage channel. It is considered there is available capacity in the surrounding local and regional road network to support development of the site. The location is proximate to existing bus routes and stops to the immediate north of the site and a pedestrian path within the site.

The site contains Category X Vegetation which can be cleared as exempt clearing work however a fauna assessment will be required to assess any impacts on animal breeding places. The site is subject to flooding as a result of its proximity to the Boyne River immediately to the east.

The site is anticipated to have sufficient water capacity connecting to the existing 100mm water main on Jacaranda Drive, with no upgrades required. The use of existing sewer mains into the site with small

extension as required would be sufficient. Geotechnical investigations indicate potential for acid sulfate soils over the site as a result of its proximity to the river as well as alluvial soils in the river environment with inundation potential. Filling is likely to be required to develop the site.

5 Preliminary Master Plan

A preliminary master plan has been prepared by Facility Design Group (FDG) for the development of an aquatic recreation centre has been prepared, a copy of which is provided as **Appendix A** and also shown in Figure 5-1. The preliminary master plan has not been specifically tailored to any of the potential sites, however is intended to inform initial review of each site's suitability for development with an aquatic centre, having regard to the nature, extent and scale of required facilities.

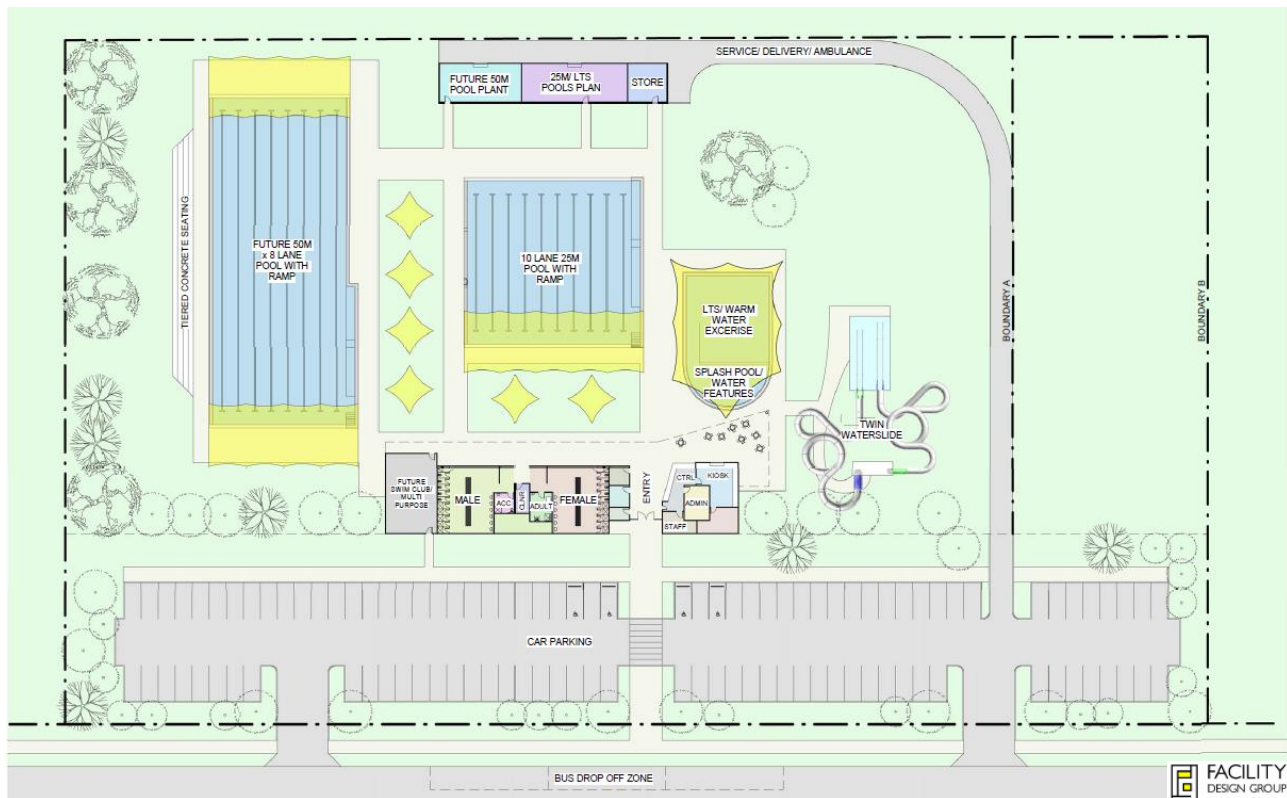


Figure 5-1 Preliminary Master Plan

Based on the brief provided to Cardno and FDG by Council, the results of community engagement already completed in the Boyne Tannum area and FDG's experience with similar facilities throughout Australia, the following components have been incorporated into the preliminary master plan:

- > a 25 metre pool;
- > future allowance for a 50 metre pool;
- > kids splash pool
- > hydrotherapy/warm water exercise pool
- > waterslide
- > swim club / meeting room
- > café; and
- > staff/management/first aid; and
- > supporting infrastructure including car parking, pedestrian paths and landscaping.

Review of available information indicates that there is limited demand for larger “dry” facilities commonly found as part of aquatic centres such as gyms, sporting facilities and other indoor spaces. As such, the design approach adopted focusses on the primary function of the centre for aquatic recreation, with all facilities provided supporting and ancillary to this primary function. Based on FDG’s experience with similar facilities, consideration would be required as to the existing availability of potential secondary functions (such as gyms) in the local area before these were contemplated to be provided as part of the aquatic centre.

FDG has been mindful of ensuring the facility delivered maximises the return on investment made by Council, given the significant capital outlay associated with establishing an aquatic centre. It is noted that Gladstone has a large regional facility with an eight (8) lane 50 metre pool which will be easily capable of catering for large meets and carnivals with the Gladstone region. In this context, the masterplan for the Boyne Tannum Aquatic Recreation Centre is focussed on providing a facility which delivers on the basic aquatic needs of the local catchment rather than attempting to establish a large high end facility that would likely be unaffordable.

FDG has also considered the operational costs of the aquatic centre for the life of the facility. This includes efficiency in staffing/supervision, robust and relatively simple filtration, solar innovation and supplementary power as critical elements. Further discussion in this regard is provided in Chapter 7 of this report.

The preliminary master plan is intended to maximise opportunities for staged delivery of the facility, as demand necessitates and/or funding is available.

Further detail in relation to each proposed component is provided in the following subsections.

5.2 25 Metre Pool

A 25 metre pool, to be at least 8 lanes wide, will form the primary component of the initial facility. The pool will include an accessible ramp and ambulant stair entry as well as shade structure over shallow end of pool.

FDG has provided for a 10 lane, 25 metre pool as part of the preliminary master plan in **Appendix A**. FDG considers that a 10 lane, 25 metre pool will provide the greatest flexibility for programming at any one time, whilst minimising overall cost compared to alternatives (such as a 50 metre pool).

5.3 50 Metre Pool (Future)

Allowance has been made for the future provision of a 50 metre pool, to be at least eight (8) lanes wide. Noting the significant area required for a 50 metre pool, it is considered prudent for the current planning of the facility to allow for future expansion, should demand ever necessitate. The 50 metre pool has been aligned to be parallel with the 25 metre pool to ensure efficient lifeguarding of two pools by one lifeguard, with a minimum four (4) metre wide concourse separating the pools.

Allowance has been made for an assessable ramp, ambulant stairs and tiered seating to cater for carnivals. This will be preferably in the form of low level concrete tiers with shade structure above to the western side of the pool. The pool is to have a shade structure at the shallow end allowing for a marshalling area for carnivals.

The 50 metre pool has been intentionally located to ensure it can be constructed at a later date without disrupting the operation of the first stage of the facility.

5.4 Kids Splash Pool

FDG has noted that an oversight with many modern aquatic centres is the installation of zero depth splash pools at the exclusion of shallow water to approximately 300-400mm deep. This has proven problematic in that the public demand shallow water for toddlers. Shallow water enables a transition of water familiarisation for very young children. FDG recommends a water splash pool in a shallow water environment. This caters for the broader community, noting that the entire aquatic centre has to be manned by lifeguards at all times.

5.5 Hydrotherapy/Warm Water Exercise Pool

A hydrotherapy/warm water exercise pool has been included in the preliminary master plan. Warm water exercise in deeper water is a sought after experience for both the elderly and the infirmed, as well as for learning to swim. As an outdoor pool environment in a tropical setting, the combination of a kids splash pool with warm water exercise (hydrotherapy) is an efficient way to cater for both. These pools need to be warmed and in an outdoor environment can be combined into the one filtration and heating system, providing great efficiency. This single combination pool will also require shade structures. This water zone is typically best situated adjacent café/social areas to improve passive surveillance by parents.

5.6 Waterslide

A great attractor of youth and custom to the aquatic centre is a waterslide. This facility generally cannot run continuously as staffing requirements make them expensive to operate. Programmed times of operation and extra fees paid to participate can provide a boost to revenue of the facility. Placement is important with regard to easy supervision and operation.

5.7 Swim Club / Meeting Room

Allowance has been made for a swim club / meeting room, which will be of particular importance should a 50 metre pool be provided in the future. Ideally this component when used as a meeting or multipurpose room should have independent access from the car parking area for out of hours use. This approach can increase the potential use of the facility and diversify the community spaces available to Council. It should contain its own toilets and kitchenette facilities as well as lock up storage/cupboards for user groups.

5.8 Café

A café is seen by FDG as essential to a complex of this nature. FDG recommends that kiosk and control operations are directly linked to enable minimal staff to operate the facility. In quiet times a single staff member can operate control and kiosk facilities. A café social zone spilling out to be adjacent to the splash pool/hydrotherapy warm water exercise pool is essential. This provides extra passive surveillance to toddler areas with parents seated in a comfortable shaded café/social zone nearby.

5.9 Staff Management / First Aid

Provision has been made for internal staff management and first aid areas within the central / kiosk area. This approach ensures maximised efficiency in staffing, which is particularly relevant when patronage is lower.

5.10 Supporting Infrastructure

In addition to the primary components of the facility a range of supporting infrastructure has been allowed for, namely:

- > change rooms and toilet facilities;
- > on-site car parking for at least 100 vehicles;
- > on-site coach parking for up two buses for school carnivals; and
- > landscaping areas throughout the site.

6 Options Analysis

Chapter 6 provides an options analysis of each of the three (3) potential sites presented in Chapter 4 of this report, with the intent of selecting a site appropriate for the future aquatic centre. To assist in the options analysis, an overlay of the preliminary master plan over each site has been prepared and is included as **Appendix C**.

The options analysis completed is documented in Table 6-1.

Table 6-1 Options Analysis

Site	Physical Analysis	Technical Analysis
Site 1 Lot 900 Coronation Drive, Tannum Sands	<ul style="list-style-type: none"> The site is a large parcel of unimproved land with elongated, straight boundaries allowing flexibility in the developable footprint with minimal physical constraints. The size and shape of the site affords the ability for sufficient separation to be achieved to any nearby land uses, including provision of screening as appropriate. The site is located proximate to the centre of Tannum Sands and local schools. The available land area supports the potential to expand the aquatic centre on the site or development other community facilities on the same land as demand necessitates. 	<ul style="list-style-type: none"> The site is within the Emerging Communities Zone. The proposed Aquatic Centre aligns with the purpose of the zone which is for urban development supportive of the surrounding residential uses. A development application would be required to develop the aquatic centre which would be subject to either Code Assessment or Impact Assessment. There is sufficient capacity in the existing treated water network in Coronation Drive to supply to the site. The downstream gravity sewer mains would require upgrading to provide suitable connection to the site. There is a mapped 'moderate' waterway within the northern area of the site that can likely be avoided in the development of the site. The majority of the site is mapped as a Medium Potential Bushfire Intensity risk area. The site fronts Coronation Drive which intersects with a state controlled road (Tannum Sands Road) to the east. Both roads form part of the higher order road network. The site has potential for multiple access points along Coronation Drive with capacity for adequate sight distances. The site is proximate to existing bus routes and stops. The site is proximate to a newly developed active transport corridor on Tannum Sands Road, which could easily be extended to service the site. The site is subject to areas of unweathered rock and specific consideration of geotechnical conditions would be required as part of future development.
Site 2 10 Canoe Point, Tannum Sands	<ul style="list-style-type: none"> The site is a narrow parcel of land with an asymmetrical shape that physically constrains the eastern corner of the site with its harsh boundary. The site is presently improved by the Tanyella Recreation Grounds and includes a range of existing uses (Tennis Courts, car parking and a lake). The existing uses limit the land available for the development of the aquatic centre. Based on information provided by Council, the existing uses have current leases expiring between 2026 and 2028 	<ul style="list-style-type: none"> The site is within the Sports and Recreation Zone. The proposed Aquatic Centre is consistent with the zoning and intended use for the site. Development of the site for an aquatic centre could potentially qualify as Accepted Development (no development application) if limited to Outdoor Sport and Recreation use, complying with other requirements and avoiding overlays. A Code Assessable development application will otherwise be required. The site presents a high likelihood of potential acid sulfate soils due to its proximity to the

Site	Physical Analysis	Technical Analysis
	<p>that would need to be respected in future development and use of the site. Any potential to increase land available for the aquatic centre would therefore not be able to occur until at least 2026.</p> <ul style="list-style-type: none"> The only available land for the development of the aquatic centre is narrow and physically constrained. Whilst the proposed centre could be accommodated on the site, further expansion would be limited without the removal of existing community facilities. Further detail is provided in Appendix C. The site is located proximate to a large area of residential development to the south. 	<p>coast. Weathered rock may also be encountered.</p> <ul style="list-style-type: none"> The existing treated water main currently servicing the site would need to be upgraded and a further 150m in Caledon Street would need to be upgraded. The existing sewer main on site has acceptable capacity for the development and no upgrades are likely to be required to the external sewer main. The eastern portion of the site is heavily constrained by ecology and coastal processes as a result of its proximity to the beach. This area is not considered suitable for development. Access is available from The Oaks Road and Canoe Point Road. In order to access the higher order road network, traffic from the site must traverse the residential area to the south. There are no bus stops within 400 metres of the site.
Site 3 Jacaranda Drive, Boyne Island	<ul style="list-style-type: none"> The site is a very narrow parcel of land physically constrained by the Boyne River to the east. The shape and location of the site would limit the developable footprint, as shown in Appendix C. An existing drainage channel within the western area of the site further constrains the developable footprint within the site along with access opportunities. It is noted that the caravan park located to the north currently encroaches into the site, which further limits available land. The site is located in an area improved by a range of sporting and recreational uses. The site has been subject to previous uses with various infrastructure (including underground) remaining on the site. Further investigation is required as to any constraints previous uses may present. 	<ul style="list-style-type: none"> The site is within the Low Density Residential Zone which does not generally support the intended use of the site for an aquatic centre An Impact Assessable development application, which requires assessment against the entire planning scheme and involves the public notification process, would be triggered by development on the site. The site has a high likelihood of potential acid sulfate soils due to proximity to the river. The majority of the site is subject to flooding from the Boyne River (Q100 event). Significant filling of the site would be required to establish a building pad above the Defined Flood Event (DFE). A flood study is recommended to determine the impact caused by the required filling. Infrastructure associated with the aquatic centre would need to be located above the DFE to avoid contamination in a flood event. No upgrades will be required to the external treated water network to support the development An existing sewer main is located within the site and it is determined feasible to connect in to this infrastructure without upgrades The majority of the site is mapped as a Medium Potential Bushfire Intensity risk area. The site is mapped as containing a Medium Storm Tide Inundation Zone. The site is proximate to existing bus routes and stops. A footpath passes through the northern portion of the site.

On the basis of the options analysis completed and documented in Table 6-1, it is recommended that Site 1 be identified as a preferred site for the aquatic centre utilising the preliminary master plan. It is specifically noted that:

- > Site 1 includes an extensive land area, providing flexibility in design and siting of the aquatic centre, provision of appropriate buffering, opportunities for expansion as needed and potential future colocation of other community uses.
- > An aquatic centre is considered to be consistent with the Emerging Communities Zone, within which Site 1 is located.
- > Site 1 is provided with appropriate access opportunities associated with travel by private vehicle, public transport and active transport.
- > Site 1 is located near the centre of Tannum Sands and is therefore proximate to a range of higher order uses including shopping centres and schools. Development of the site with an aquatic centre would serve to further consolidate the role of the area in servicing the
- > Site 1 is not subject to any significant environmental constraints that could not otherwise be avoided through siting and design.
- > Sites 2 and 3 are subject to a range of physical and technical constraints which would add complexity to the design, siting, construction and operation of an aquatic centre. Both Sites 2 and 3 include limited land area to develop the aquatic centre as noted in **Appendix C**.

7 Costings

The project team has prepared a range of cost estimates associated with the development of an aquatic centre on Site 1, based on the preliminary master plan (**Appendix A**). These estimates are outlined in the following subsections.

7.1 Construction (Facility)

FDG has prepared an opinion of probable construction cost for the aquatic centre based on the preliminary master plan. Previous projects conducted by FDG adopted an 8% contingency on all aquatic centres built in a greenfield scenario. The 8% contingency does not include services augmentation specific to the project site and needs nor does it include costs associated with specialist consultant services as the project progresses. Table 7-1 outlines the estimate prepared.

Table 7-1 Construction Cost Estimate

Component	M ² / Item	Cost /m ²	Total
a. Services augmentation – electricity, sewer, water, fire	Item	Item	\$ 400,000
b. Earthworks & Excavation for carparking, buildings & pools	Item	Item	\$ 150,000
Sub Total	-	-	\$ 550,000
Main Building Construction			
1. Entry foyer, 1st aid, access wc, utility room.	68 m2	\$ 2,500 m2	\$ 170,000
2. Control, kiosk, admin, staff including \$ 60K kiosk fitout	110 m2	\$ 2,200 m2 + \$60K	\$ 302,000
3. Amenities change, adult change	250 m2	\$ 2,900	\$ 725,000
4. Swim club/multi purpose room	100 m2	\$ 2,250 m2	\$ 225,000
5. 10 lane x 25m lap pool	Item	\$ 1,400,000	\$ 1,400,000
6. Shade structure to 25m pool x one	Item	\$ 38,000	\$ 38,000
7. Shallow water splash park with water features + LTS warm water exercise pool.	Item	\$ 700,000	\$ 700,000
8. Shade structure to LTS Pool	Item	\$ 35,000	\$ 35,000
9. Twin Waterslide & associated works.	Item	\$ 750,000	\$ 750,000
10. Store	36 m2	\$ 1,200	\$ 43,200
11. 25M/LTS plant room	96 m2	\$ 1,600	\$ 153,600
12. Filtration plant for 25m + LTS pool	Item	\$ 750,000	\$ 750,000
13. Future 50m pool plant room	72 m2	\$ 1,600	\$ 115,200
14. Filtration plant for 50m pool	Item	\$ 800,000	\$ 800,000
15. New 50 m x 8 lane lap pool.	Item	\$ 2,000,000	\$ 2,000,000
16. Shade structure to both ends of 50m pool	Item	\$ 85,000	\$ 85,000
17. Tiered concrete seating + shade structure	Item	\$ 180,000	\$ 180,000
18. Future water activities expansion.	Item	\$ 1,000,000	\$ 1,000,000
19. Carparking.	3,000 m2	\$ 140 m2	\$ 420,000
20. Landscaping & fencing	Item	\$ 200,000	\$ 200,000

21. Sub Total	-	-	\$ 10,642,000
22. Preliminaries over \$ 10,642,000	15%	-	\$ 1,596,300
23. Contingency over \$ 10,642,000	8%	-	\$ 851,360
24. Professional Fees over \$ 10,522,000	8%	-	\$ 851,360
25. Grand Total			\$ 13,941,020

7.2 Construction (Civil Infrastructure)

Cardno has prepared a construction cost estimate for civil infrastructure upgrades at Site 1 associated with the establishment of an aquatic centre. This estimate is based on the technical assessment included in **Appendix B**. Table 7-2 outlines the estimate prepared.

Table 7-2 Civil Infrastructure Cost Estimate

Action	Quantity	Unit	Rates	Amount
Earthworks				
Site Stripping (1mm)	1031.5	m ²	\$2.00	\$2,063.00
Bulk Earthworks (cut/fill)	10315	m ³	\$30.00	\$309,450.00
Swimming Pool Cut (50m)	2000	m ³	\$35.00	\$70,000.00
Swimming Pool Cut (25m)	1300	m ³	\$35.00	\$45,500.00
Slide Area	91	m ³	\$35.00	\$3,185.00
Car Park				
Carpark (including earthworks)	4804	m ²	\$115.45	\$554,621.80
Stormwater				
Detention Basin Cut	200	m ³	\$35.00	\$7,000.00
Stormwater Treatment	96.08	m ²	\$1,500.00	\$144,120.00
Water				
Connection to Water Network	Allowance	-	-	\$2,000.00
Sewer				
Sewer Gravity Upgrade (225mm)	300	m	\$600.00	\$180,000.00
Contingency	30	%	-	\$395,381.94
Design	5	%	-	\$65,896.99
Total				\$1,779,218.73

7.3 Operational

Xypher Sport and Leisure have prepared an operating model associated with the establishment of an aquatic centre. The summary report of the operating model is included in **Appendix E**.

7.4 Maintenance (Assets)

Cardno has prepared a spreadsheet of maintenance costs and asset componentisation for the aquatic centre and is included in **Appendix F**.

7.5 Cost Exclusions

The following potential future costs have been excluded from this report:

- > All costs relating to the preparation and lodgement of development applications to obtain the relevant development permits and any associated supporting technical reports, assessment and investigations;
- > All costs related to intersection modelling and the construction of intersection upgrades

8 Conclusion and Recommendations

This report documents an options analysis work completed by Cardno to determine the most appropriate site for the future Boyne Tannum Aquatic Recreation Centre. The analysis completed has considered town planning, civil engineering, environment, traffic engineering and geotechnical engineering matters. The analysis has been informed by the preliminary master plan (see **Appendix A**).

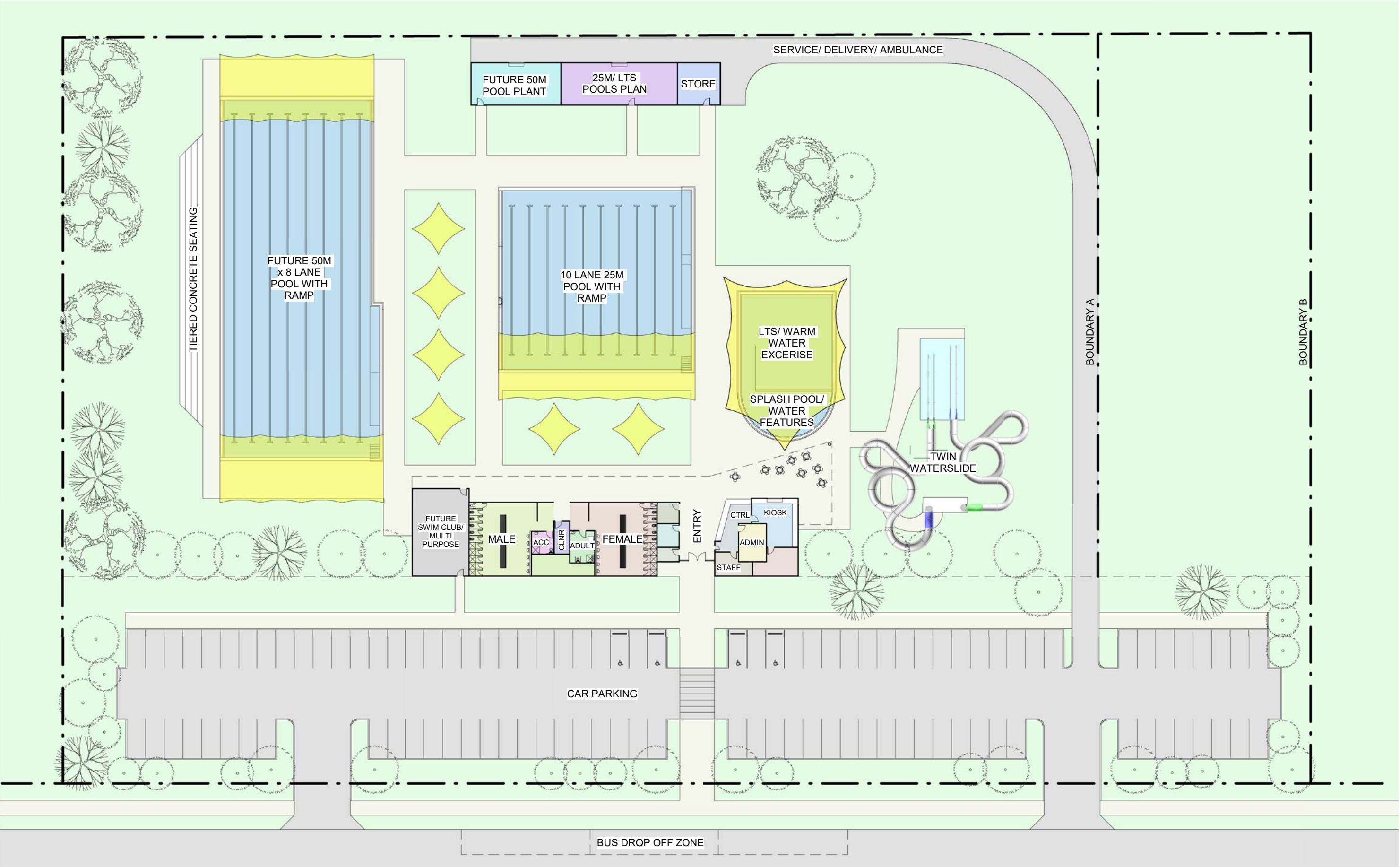
The report identifies that Site 1 – Lot 900 Coronation Drive, Tannum Sands is the recommended site for the aquatic centre. On the basis of the analysis documented in this report, it is recommended that Council:

- > Confirm the suitability of Site 1 and adopt the site as a preferred site for the project;
- > Complete a detailed review of the preliminary master plan and complete refinements and revisions where appropriate;
- > Complete further investigations, as required, to confirm the accuracy of currently available information;
- > Undertake detailed community consultation relating to the development of Site 1;
- > Progress with the detailed design of the aquatic centre on Site 1, when appropriate, to allow for the accurate costing of the project and progression toward construction.
- > Consider and assess how to accommodate the operational costs of the aquatic facility within the annual operational budget and long term financial forecast; and
- > Undertake a further detailed review of the capital costs.

APPENDIX

A

PRELIMINARY MASTER PLAN



**FACILITY
DESIGN GROUP**
Architecture & Construction

19 THE TERRACE
CAMBEWARRA NSW 2540
PH: 02 4666 0777
E: info@fdg.com.au WEB: www.fdg.com.au
DO NOT SCALE OFF DRAWINGS. WORK TO FIGURED DIMENSIONS ONLY.
VERIFY DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
NOMINATED ARCHITECT: STEPHEN JOHANSSON - NSW REG No. 7168

PROJECT
BOYNE TANUM AQUATIC RECREATION CENTRE

THIS DRAWING IS COPYRIGHT & IS THE PROPERTY OF FACILITY DESIGN GROUP PTY LTD

CLIENT

DRAWING TITLE
FLOOR PLAN

DRAWING No.	A100			REVISION
SCALE	1 : 500	DATE	6/5/20	JOB No. Project Number

7/05/2020 2:27:37 PM

APPENDIX

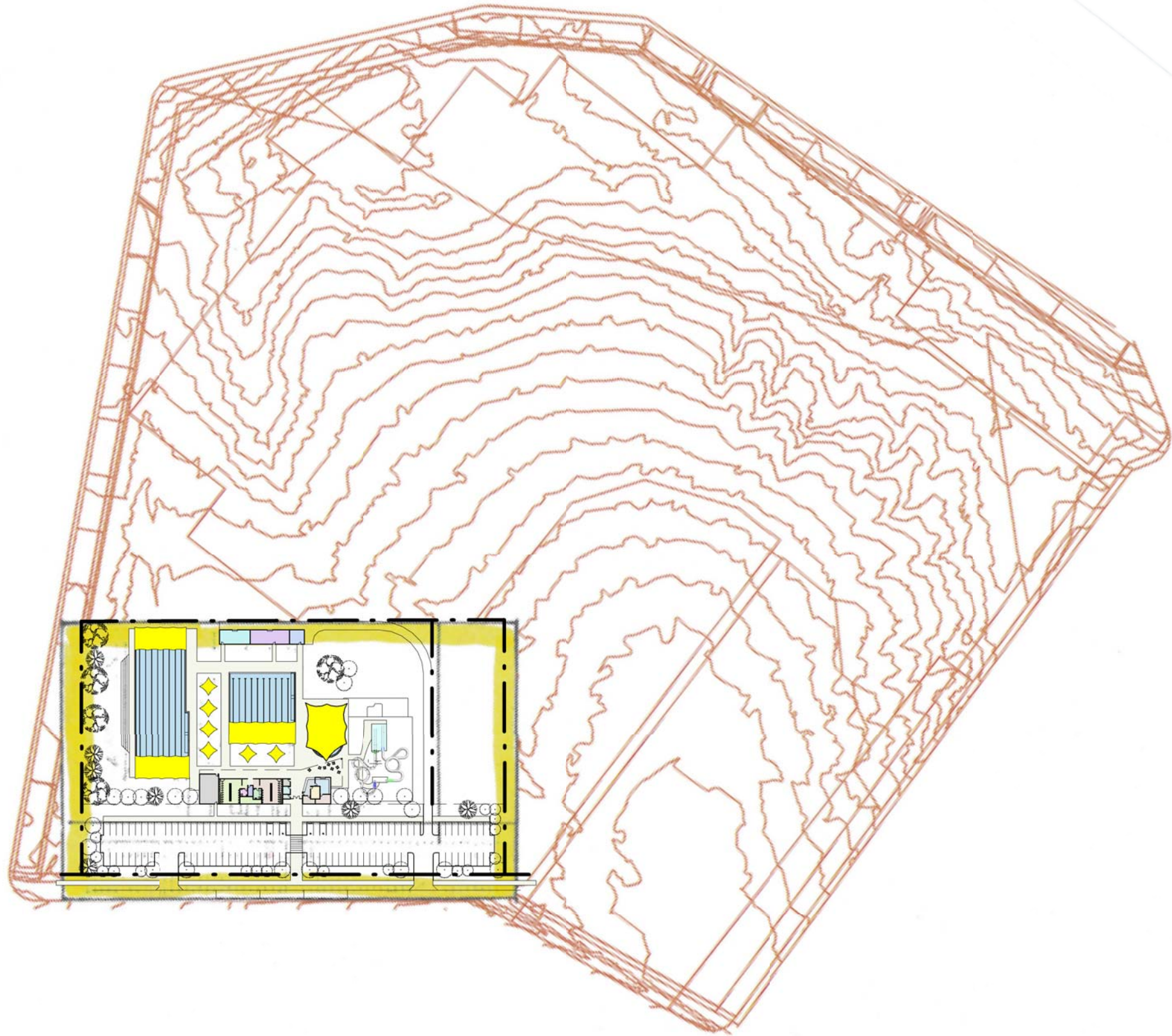
B

SITE ANALYSIS REPORTS

APPENDIX

C

PRELIMINARY MASTER PLAN OVERLAY



**FACILITY
DESIGN GROUP**
Architecture & Construction

19 THE TERRACE
CAMBEWARRA NSW 2540
PH: 02 4666 0777
E: info@fdg.com.au WEB: www.fdg.com.au
DO NOT SCALE OFF DRAWINGS. WORK TO FIGURED DIMENSIONS ONLY.
VERIFY DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
NOMINATED ARCHITECT: STEPHEN JOHANSSON - NSW REG No. 7168

PROJECT
BOYNE TANUM AQUATIC RECREATION CENTRE

THIS DRAWING IS COPYRIGHT & IS THE PROPERTY OF FACILITY DESIGN GROUP PTY LTD

CLIENT

DRAWING TITLE
SITE PLAN 1

DRAWING No. A050				REVISION
SCALE 1 : 2000	DATE 6/5/20	JOB No.	Project Number	

7/05/2020 2:27:22 PM



**FACILITY
DESIGN GROUP**
Architecture & Construction

19 THE TERRACE
CAMBEWARRA NSW 2540
PH: 02 4666 0777
E: info@fdg.com.au WEB: www.fdg.com.au
DO NOT SCALE OFF DRAWINGS. WORK TO FIGURED DIMENSIONS ONLY.
VERIFY DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
NOMINATED ARCHITECT: STEPHEN JOHANSSON - NSW REG No. 7168

PROJECT
BOYNE TANUM AQUATIC RECREATION CENTRE

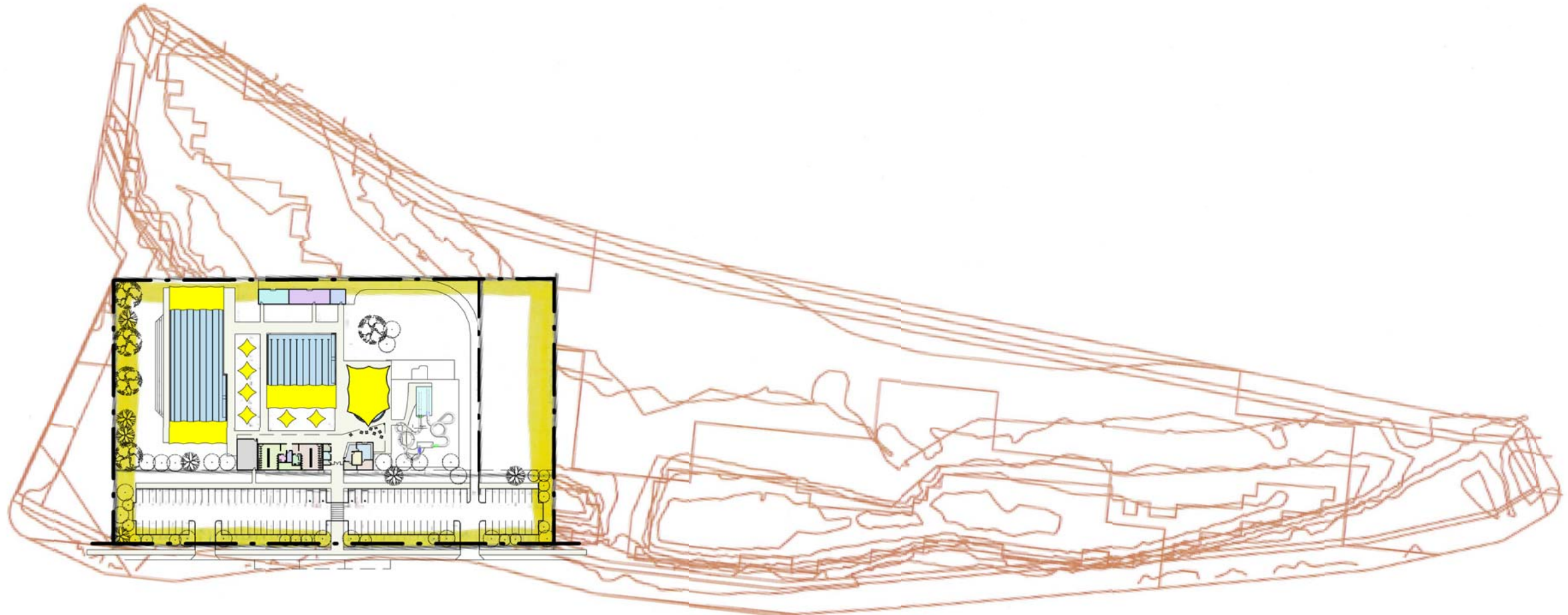
THIS DRAWING IS COPYRIGHT & IS THE PROPERTY OF FACILITY DESIGN GROUP PTY LTD

CLIENT

DRAWING TITLE
SITE PLAN 2

DRAWING No. A051				REVISION
SCALE 1 : 2000	DATE 6/5/20	JOB No.	Project Number	

7/05/2020 2:27:26 PM



**FACILITY
DESIGN GROUP**
Architecture & Construction

19 THE TERRACE
CAMBEWARRA NSW 2540
PH: 02 4666 0777
E: info@fdg.com.au WEB: www.fdg.com.au
DO NOT SCALE OFF DRAWINGS. WORK TO FIGURED DIMENSIONS ONLY.
VERIFY DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
NOMINATED ARCHITECT: STEPHEN JOHANSSON - NSW REG No. 7168

PROJECT
BOYNE TANUM AQUATIC RECREATION CENTRE

THIS DRAWING IS COPYRIGHT & IS THE PROPERTY OF FACILITY DESIGN GROUP PTY LTD

CLIENT

DRAWING TITLE
SITE PLAN 3

DRAWING No. A052				REVISION
SCALE	DATE	JOB No.	Project Number	
1 : 2000	6/5/20			

7/05/2020 2:27:30 PM

APPENDIX

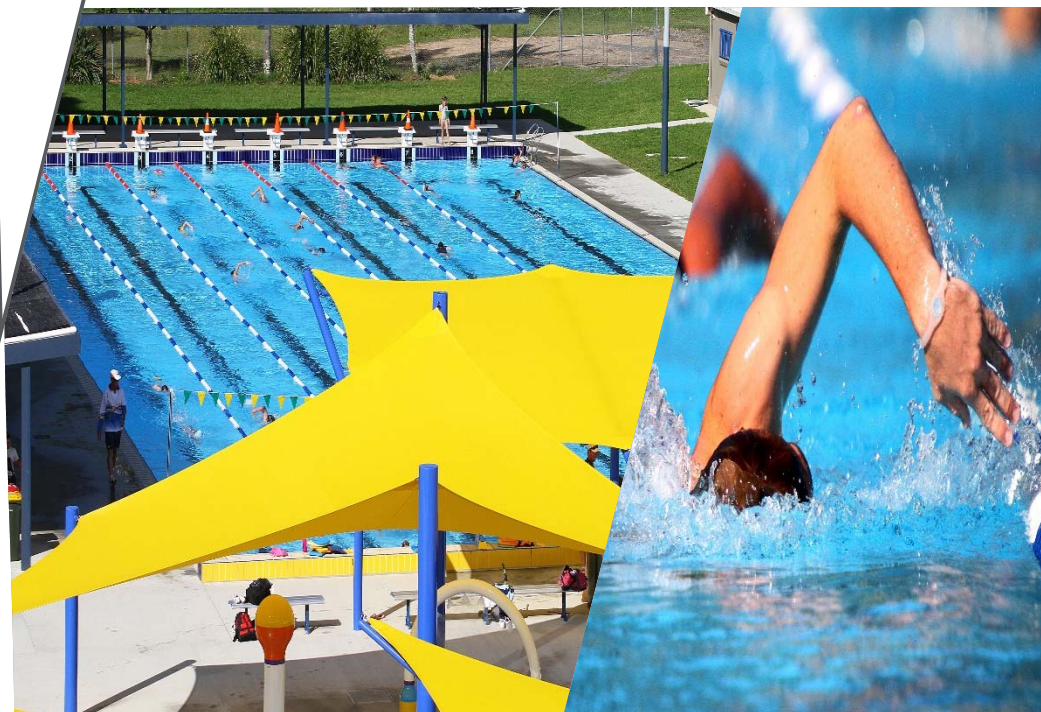
D

SITE REVIEW WORKSHOP
PRESENTATION

Site Review Workshop

Boyne Tannum Aquatic Recreation
Centre Options Analysis

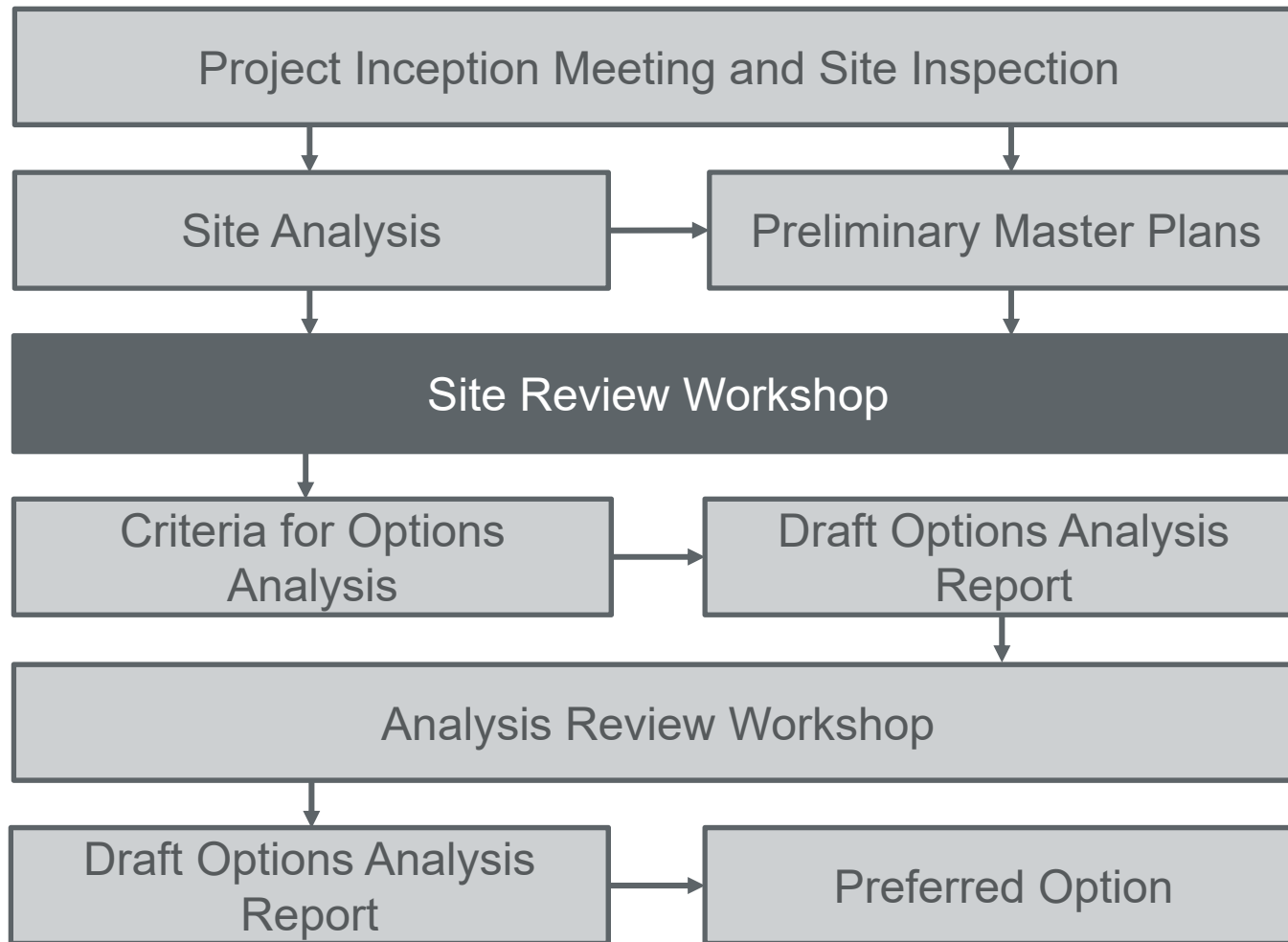
16 January 2019



Project Background

- > Council has identified a need for an aquatic recreation centre in the Boyne Tannum area
- > Likely facilities:
 - a 25 metre pool or a 50 metre pool
 - kids splash pool
 - hydrotherapy/warm water exercise pool
 - waterslide
 - swim club / meeting room
 - café
 - staff/management/first aid
 - supporting infrastructure including car parking, pedestrian paths and landscaping.
- > Three (3) potential sites have been nominated for further investigation

Project Approach



We are here

Purpose of Today

Work completed:

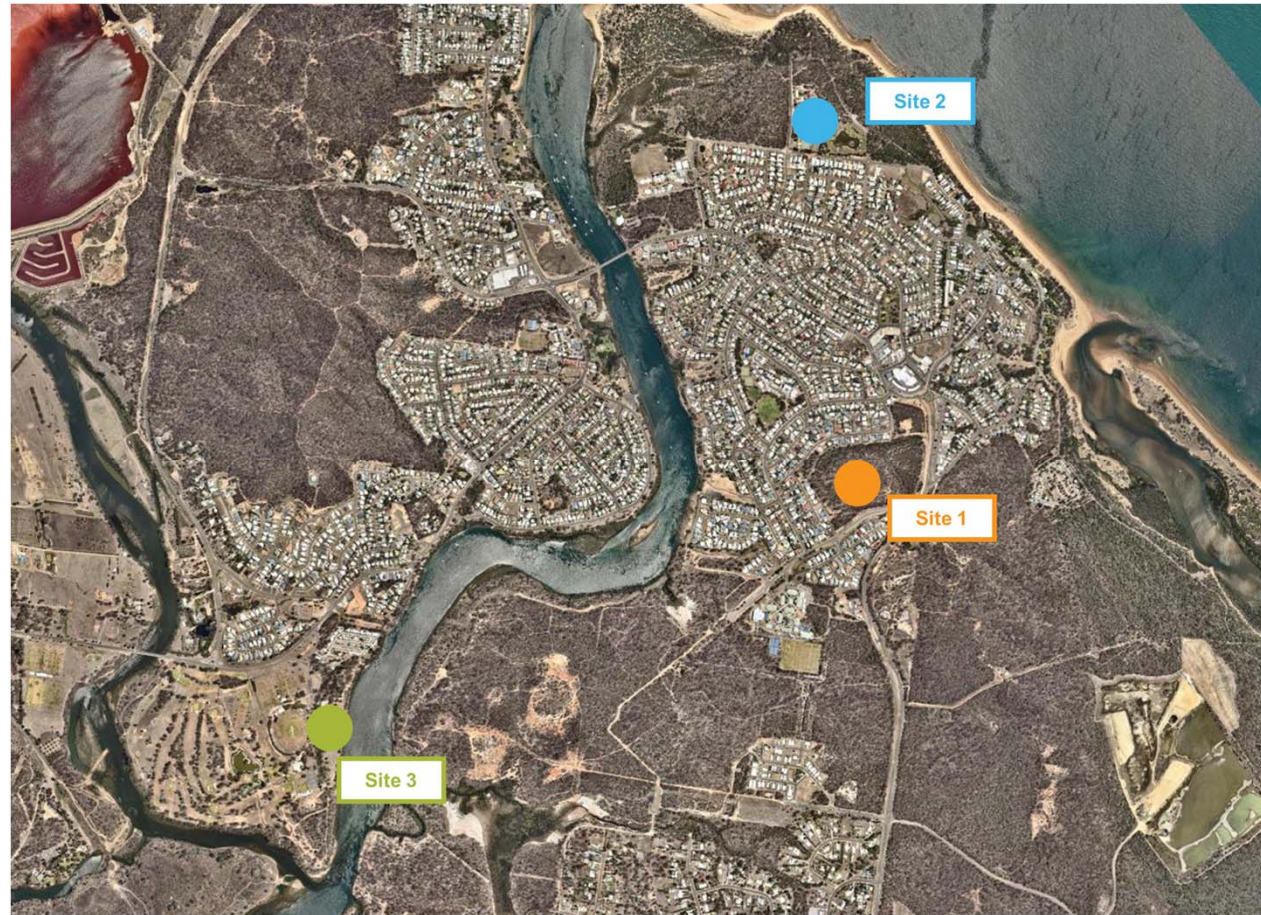
- > Summarise and discuss the findings of the site analysis reports
- > Discuss the preliminary master planning exercise

Next steps:

- > Confirm design approach and project direction
- > Workshop criteria for the options analysis
- > Proceed with options analysis

Sites

- > **Site 1**
20 Dunn Street,
Tannum Sands
- > **Site 2**
10 Canoe Point
Road, Tannum
Sands
- > **Site 3**
Jacaranda Drive,
Boyne Island



Technical Analysis

- > Town Planning Review (Chapter 3)
- > Civil Engineering Review (Chapter 4)
- > Environmental Review (Chapter 5)
- > Traffic Engineering Review (Chapter 6)
- > Geotechnical Engineering Review (including field investigation) (Chapter 7 and Appendix B)

Findings applicable to all sites

- > Defined land uses (planning scheme):
 - Outdoor Sport and Recreation
 - Indoor Sport and Recreation (considered for completeness / future development)

- > Development area assumed to be 1.5 hectares for EP calculations – based on preliminary master plan
 - Anticipated Water Loading – 46.9KL/day as per CMDG
 - Anticipated Sewer Loading – 18.9KL/day as per CMDG

- > Car Parking - recommended supply between 82 spaces and 103 spaces
 - Review of planning scheme car parking rates
 - Review of similar facilities across Queensland including Gladstone Aquatic Centre
 - Anticipated attendance cross section – based on Gladstone attendance
 - Previous experience – FDG

Site 1 – 20 Dunn Street, Tannum Sands



Site 1 – 20 Dunn Street, Tannum Sands

- > Land area of 99,250sqm
- > Proximate to shopping centre, Primary School and High School
- > Currently unimproved

- > Emerging Community Zone – intended for future urban development
- > MCU Development Approval required
 - Outdoor Sport and Recreation – Code Assessment
 - Indoor Sport and Recreation – Impact Assessment
- > Category B regulated vegetation – likely able to be cleared as exempt clearing work
- > Potential impact on essential habitat – assessment required
- > Mapped waterway in north – can likely be avoided

Site 1 – 20 Dunn Street, Tannum Sands

- > Sufficient water capacity – connection to be to existing 200mm water main on Coronation Drive
- > Need to complete upgrade of sewerage infrastructure – 2 options – see Figure 4-5
- > Suitable access available from Coronation Drive – available sight distance
- > Coronation Drive intersects with Tannum Sands Road
- > Available capacity in surrounding local and regional road network
- > Proximate to existing bus routes and stops – potential small modification to service the site
- > Higher order active transport path on Tannum Sands Road – simple connection to site
- > Potential for weathered rock – deeper excavation better suited to western edge of site
- > Potential for acid sulfate soils – low likelihood – site partly above 20 metres AHD

Site 2 – 10 Canoe Point Road, Tannum Sands



Site 2 – 10 Canoe Point Road, Tannum Sands

- > Land area of 84,630sqm
- > North of Tannum Sands proximate to beach
- > Currently improved with open space including tennis courts, lake and community buildings
- > Sport and Recreation Zone – uses consistent with intent
- > Eastern portion of site is heavily constrained – ecology, coastal processes
- > Potential to be Accepted Development if limited to Outdoor Sport and Recreation, complying with requirements and avoiding select overlays
- > MCU Development Approval will otherwise be required – Code Assessment
- > Site contains Category B, R and X vegetation – due to land tenure an Operational Works approval for vegetation clearing and a Section 22A determination is likely required
- > A fauna assessment will be required to assess any impacts on animal breeding places.

Site 2 – 10 Canoe Point Road, Tannum Sands

- > Sufficient water capacity – upgrade of water mains in The Oaks Road and Caledon Street (150mm diameter) to connect to site
- > Connection to 150mm sewer main in The Oaks Road with sufficient capacity
- > Access available from The Oaks Road in west – sufficient sight distance
- > Access through lower order roads in residential area to south to connect to higher order roads
- > Available capacity in surrounding local and regional road network
- > Existing bus route on Booth Avenue to south
- > Existing cycle paths associated with beach corridor
- > Potential for weathered rock below 1.5 metres AHD
- > Potential for acid sulfate soils – proximate to coastal environment

Site 3 – Jacaranda Drive, Boyne Island



Site 3 – Jacaranda Drive, Boyne Island

- > Land area of 54,830sqm
- > Adjacent to established sporting precinct
- > Some existing encroachment associated with caravan park to north
- > Presently unimproved – previous use for Council infrastructure

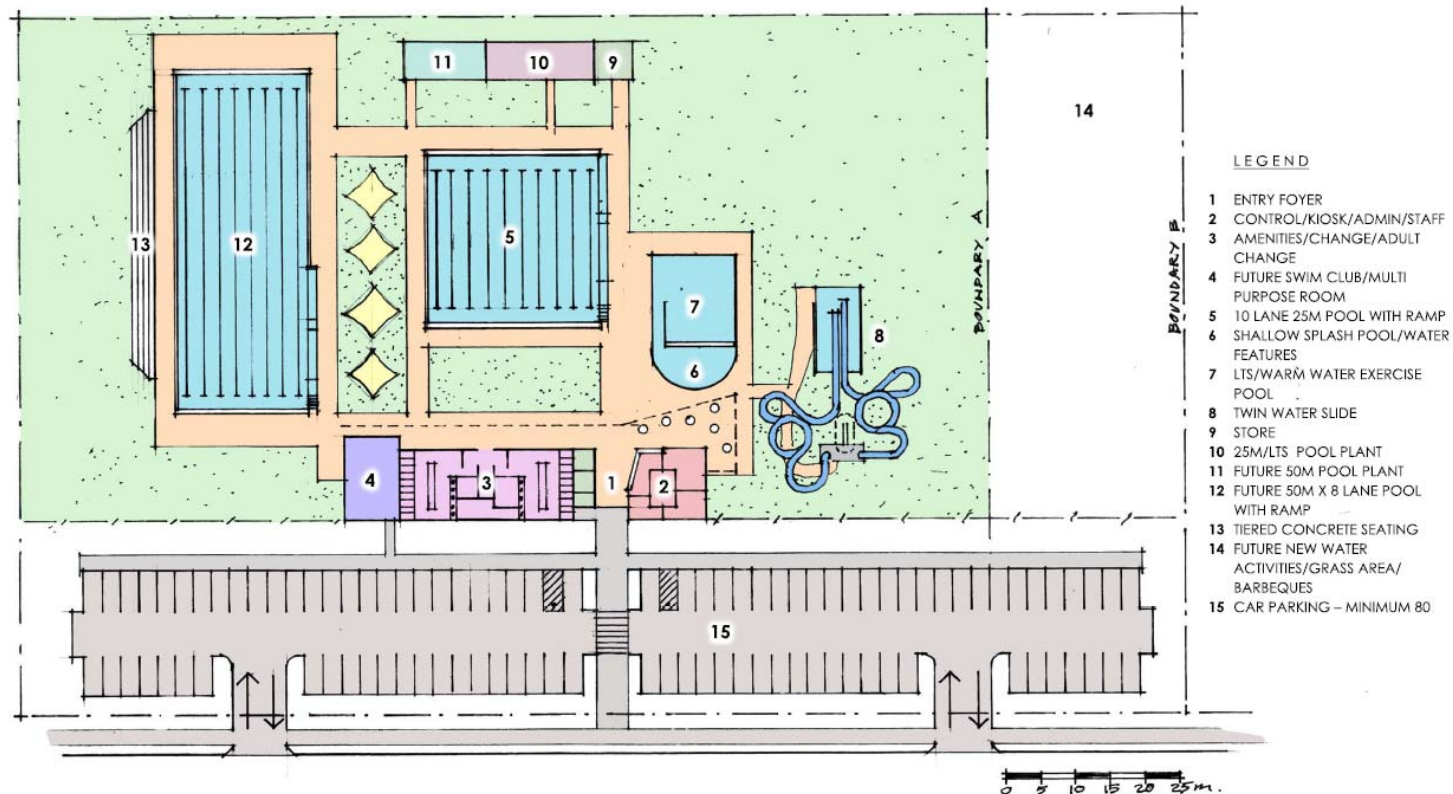
- > Low Density Residential Zone – residential land uses (primarily houses) intended
- > Subject to flooding from adjoining Boyne River
- > MCU Development Approval required – Impact Assessment (public notification required)
- > Category X vegetation - can be cleared as exempt clearing work
- > A fauna assessment will be required to assess any impacts on animal breeding places.

Site 3 – Jacaranda Drive, Boyne Island

- > Sufficient water capacity – connection to existing 100mm water main on Jacaranda Avenue – no upgrades
- > Use of existing sewer mains into site likely with small extensions as required
- > Access available from Jacaranda Avenue – available sight distance although constrained by drainage channel
- > Jacaranda Avenue intersects with Maipas Street to the north of the site
- > Available capacity in surrounding local and regional road network
- > Bus routes and bus stops to the immediate north of the site
- > Pedestrian path through the site
- > Potential for acid sulfate soils – proximate to river
- > Alluvial soils in river environment with inundation potential – filling likely required

Questions about Site Analysis?

Preliminary Master Plan



BOYNE TANNUM AQUATIC RECREATION CENTRE

CONCEPT A 13/1/20



Dimensions: Approx. 104m x 168m

17 Site Review Workshop

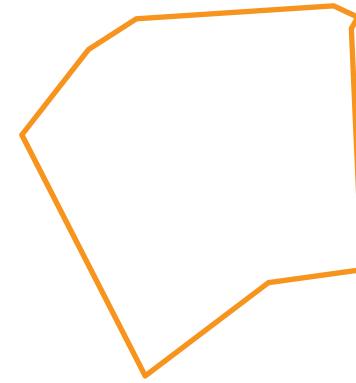
Boyne Tannum Aquatic Recreation Centre Options Analysis



Preliminary Master Plan

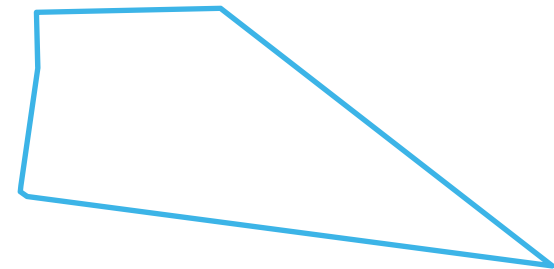
> Site 1

- Large land area with good shape and dimensions
- Accessible from Coronation Drive
- Flexibility in design



> Site 2

- Small, narrow land area
- Constrained by buildings, tennis courts and lake
- Environmental constraints in east



> Site 3

- Narrow land area limits layout options
- Subject to flooding
- Layout constrained by drainage channel
- Potential to use nearby land for supporting facilities



Project Direction – Future Work

- > Option 1 – as approved
 - Continue with a preliminary design for each site
 - Options analysis of 3 sites
 - Select a preferred site for further progression

- > Option 2 – alternative
 - Select a preferred site now – Site 1 recommended
 - Outline analysis of each site and selection of preferred option in Options Analysis Report – based on analysis completed to date
 - Options analysis of 3 design options for the one site
 - Select a preferred design option

What are Council's views on how to progress?

Multiple Criteria Analysis

Table 6-2 Multiple Criteria Analysis

Criteria	Weighting	Design Options				
		2	2A	3A	4	5
Opinion of Cost (Construction) – Interim	10%	2	6	6	10	2
Opinion of Cost (Construction) – Ultimate	10%	9	9	9	2	7
Opinion of Cost (Maintenance) – Interim	2.5%	9	9	9	10	9
Opinion of Cost (Maintenance) – Ultimate	2.5%	6	6	6	1	4
Ownership	10%	8	8	3	0	9
Environment - Regulated Vegetation	2%	7	7	7	7	1
Environment - Protected Areas	3%	8	8	3	0	10
Environment - Waterways	3%	2	2	2	7	3
Environment - Wetlands	2%	3	3	3	6	8
Environment - Other	2%	5	5	5	6	7
Connection (North)	3%	4	7	3	8	5
Connection (South)	3%	7	7	7	5	7
Serviceability	5%	10	10	10	10	10
Travel Time (Interim)	5%	6	6	6	6	2
Travel Time (Ultimate)	5%	6	6	6	9	4
Potential Flood Impact	5%	4	4	4	8	8
Additional Works	4%	5	7	4	3	2
Social Impacts	8%	5	7	7	3	8
Safety	12%	6	8	8	3	4
Existing Utilities Interface	3%	4	6	6	9	8
Unweighted Total	200	116	131	114	113	118
Weighted Total	10	5.95	6.98	6.09	5.10	5.84

Note – Table 6-2 provides a summary of the MCA undertaken. Further detail is provided in the explanatory table in **Appendix F**.

Example

Multiple Criteria Analysis - Workshop

Potential criteria ideas (**site options**):

- > Approval requirements – planning and environment
- > Land use compatibility – zoning and surrounding land use
- > Proximity to key land uses
- > Traffic upgrade requirements
- > Accessibility – private, public and active transport
- > Civil upgrade requirements
- > Flexibility in design / potential for expansion
- > Soil suitability
- > Cost

Each needs to be weighted

Multiple Criteria Analysis - Workshop

Potential criteria ideas (**design options**):

- > Approval requirements – planning and environment
- > Land use compatibility – adjoining / surrounding land use including buffering and separation
- > Access and maneuverability (traffic and pedestrian)
- > Excavation requirements
- > Cost
- > Flexibility in design / potential for expansion

Each needs to be weighted

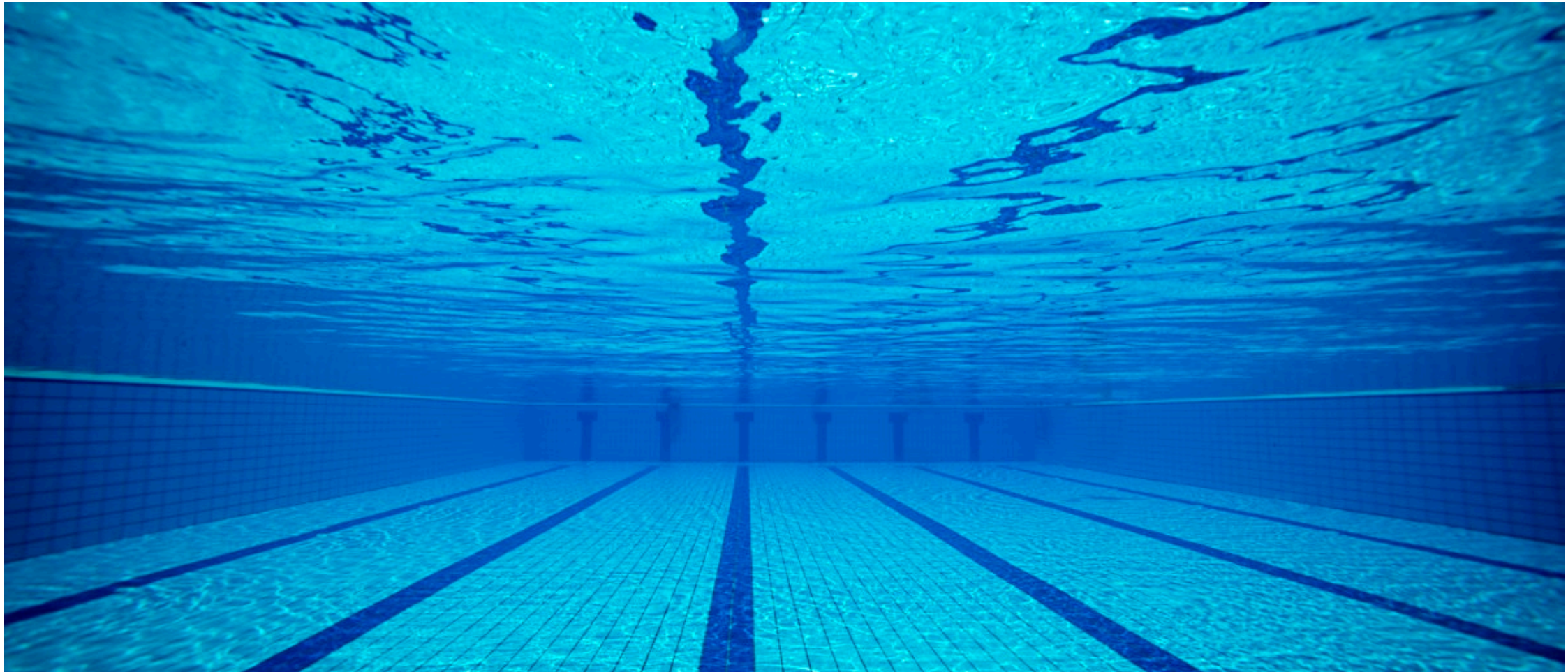
Next Steps

- > Finalisation of approach and scope of work
- > Confirmation of options analysis criteria and weighting (draft table to be provided by Cardno)
- > Preparation of draft Options Analysis Report
- > Analysis Review Workshop between Cardno and Council
- > Finalisation of final Options Analysis Report
- > Identification of preferred option
- > Identification of next steps to progress concept

APPENDIX

E

OPERATING MODEL AND COST ESTIMATE



Boyne Tannum Aquatic Recreation Centre Operating Model - Summary Report

Final Report

May 2020



Table of Contents

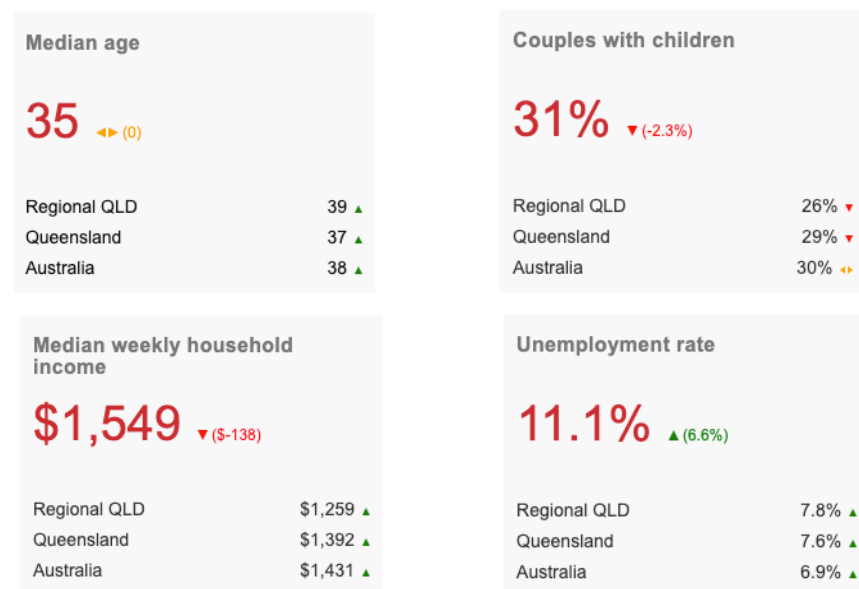
- 1. Introduction..... - 1 -
 - 1.1. Demographic Review - 1 -
- 2. Project Overview - 4 -
 - 2.1. Previous Planning and Existing Information..... - 4 -
 - 2.2. Community Engagement..... - 4 -
 - 2.3. Site Selection - 5 -
 - 2.4. Site Masterplan - 6 -
- 3. Business Model Assumptions and Inputs - 8 -
- 4. Operating Model Outcomes..... - 10 -
- Appendix A - Asset Renewal ModelA

1. Introduction

Xypher Sport and Leisure has been engaged by Cardno to prepare an operating model for the proposed Boyne Tannum Aquatic Recreation Centre (BTARC). This model will form part of an 'Options Analysis' being developed by Cardno for Gladstone Regional Council (GRC). This summary report outlines project background information and key inputs used to develop an operational model for the centre.

1.1. Demographic Review

The 2019 Estimated Resident Population for the Gladstone Local Government Area (LGA) is 63,412¹. A summary of some key demographic factors for the LGA is provided below along with comparisons with regional, state and national data.



¹ Demographic information in this section is sourced from Australian Bureau of Statistics, Census of Population and Housing compiled and presented in profile.id by .id, the population experts.

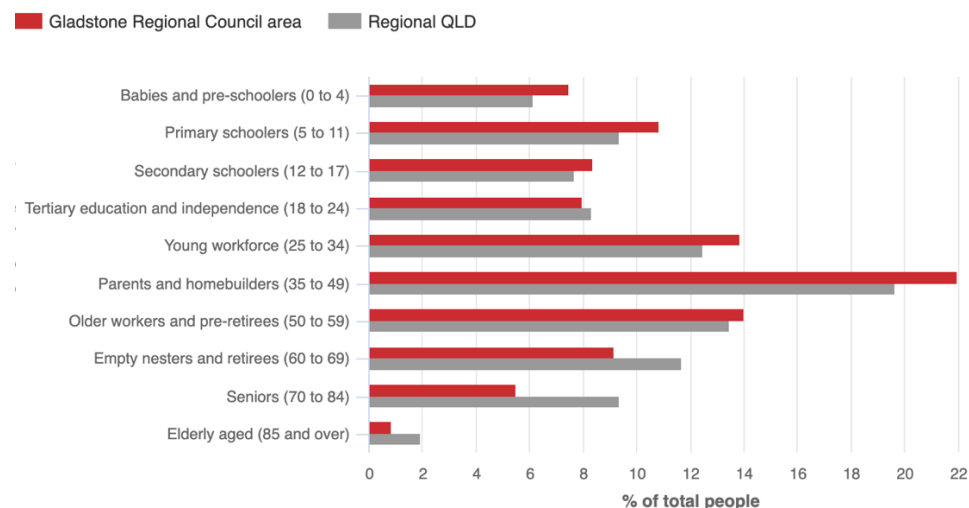
Compared to regional, state and nation averages, the population profile shows that Gladstone LGA has:

- A younger median age
- A higher proportion of households with children
- A higher weekly household income
- A higher unemployment rate

The Age Structure of the area provides key insights into the level of demand for age based services and facilities such as aquatic facilities. It is an indicator of residential role and function and how it is likely to change in the future. Service age groups divide the population into age categories that reflect typical life-stages. They indicate the level of demand for services that target people at different stages in life and how that demand is changing.

The figure below presents the age structure breakdown by 'service age groups' for the Gladstone LGA.

Figure 1 - Service age groups



Analysis of the service age groups of Gladstone Regional Council area in 2016 compared to Regional QLD shows that there was a higher proportion of people in the younger age groups (0 to 17 years) and a lower proportion of people in the older age groups (60+ years). Overall, 26.7% of the population was aged between 0 and 17, and 15.5% were aged 60 years and over, compared with 23.2% and 23.0% respectively for Regional QLD.

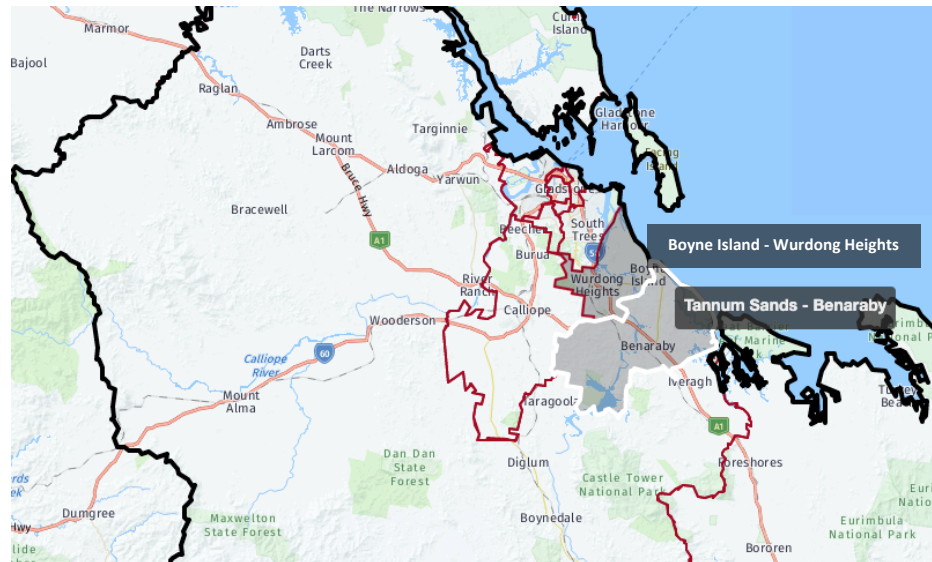
The major differences between the age structure of Gladstone Regional Council area and Regional QLD were:

- A larger percentage of 'Parents and homebuilders' (22.0% compared to 19.6%)
- A larger percentage of 'Primary schoolers' (10.9% compared to 9.4%)
- A smaller percentage of 'Seniors' (5.5% compared to 9.4%)
- A smaller percentage of 'Empty nesters and retirees' (9.2% compared to 11.7%)

1.1.1. Primary Catchment Population

The primary catchment area for the BTRAC is shown in the figure below.

Figure 2 - Primary facility catchment



Based on 2019 estimates, the population for this area is likely to be approximately 12,000. 2016 census figures are shown in the table below.

Table 1 - Gladstone LGA, small area population

Area	2016 Population
Agnes Water - Seventeen Seventy	2267
Boyne Island - Wurdong Heights	5174
Calliope	6726
Clinton - Byellee - Callemondah	5961
Gladstone City	1519
Kin Kora - Sun Valley	3877
New Auckland - Kirkwood	7264
Rural South East	3741
Rural West	3340
South Gladstone	4431
South Trees - Glen Eden and Surrounds	6169
Tannum Sands - Benaraby	6424
West Gladstone	4692
Gladstone Regional Council area	61650

The two primary catchment areas make up approximately 19% of the total GRC population.

1.1.2. Future Growth

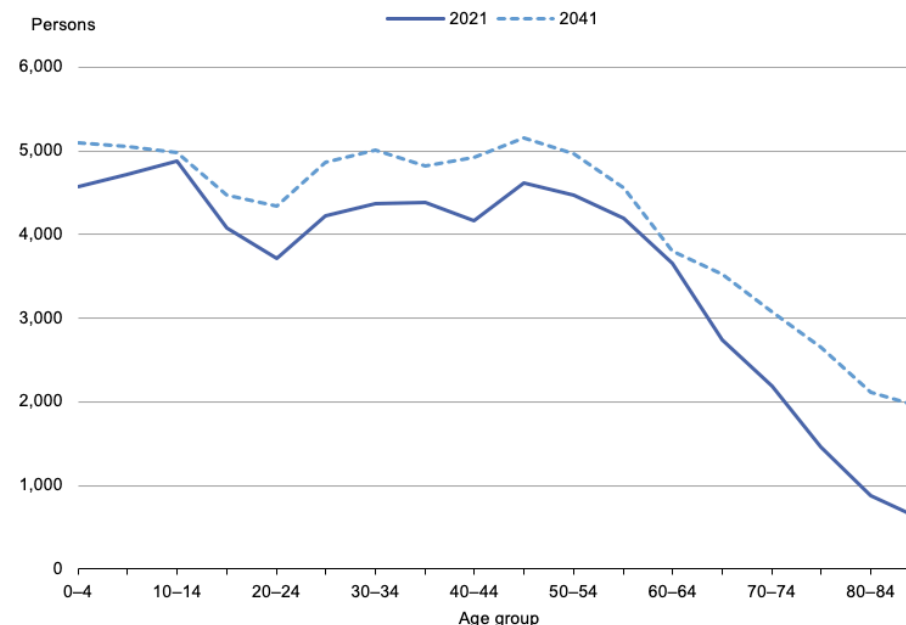
Queensland Government projections show that the population in the Gladstone LGA will increase by over 11,000 over the next 20 years. Five years age group projections from 2021 to 2041 are shown in the table below.

Table 2 - Gladstone LGA projected population (medium series), by five year age group and sex²

	2021	2026	2031	2036	2041
0-4	4,577	4,583	4,794	4,965	5,093
5-9	4,718	4,654	4,763	4,911	5,045
10-14	4,881	4,767	4,773	4,853	4,981
15-19	4,081	4,468	4,419	4,405	4,476
20-24	3,719	3,928	4,332	4,308	4,336
25-29	4,230	4,282	4,506	4,849	4,866
30-34	4,371	4,491	4,592	4,715	5,008
35-39	4,386	4,499	4,705	4,730	4,814
40-44	4,171	4,539	4,759	4,923	4,923
45-49	4,613	4,320	4,783	4,989	5,153
50-54	4,465	4,507	4,326	4,757	4,969
55-59	4,190	4,242	4,320	4,150	4,564
60-64	3,661	3,812	3,899	3,936	3,801
65-69	2,736	3,267	3,427	3,483	3,520
70-74	2,192	2,434	2,894	3,015	3,071
75-79	1,458	1,931	2,149	2,532	2,648
80-84	881	1,223	1,619	1,792	2,120
85+	610	855	1,213	1,624	1,939
Total	63,938	66,800	70,273	72,935	75,327

From 2021 to 2041, the overall population increase for the LGA is estimated at 11,389 (18%). However, the extent increases will vary between age groups as shown in the figure below.

Table 3 - Gladstone LGA projected population (medium series), by five year age group and sex



This chart shows larger increases in 20, 30 and 40 year age groups making them the dominant cohorts (along with children). Large increases will also be seen on 70 and 80 year age groups.

Queensland Government estimates for the statistical area of 'Boyne Island - Tannum Sands' indicate a 14% increase in population over the same period. Using this and the LGA growth figure as a range, means the subject catchment area (identified in section 1.1.1) is likely to have a population around 14,000 by 2041.

² Source: Queensland Government population projections, 2018 edition; Australian Bureau of Statistics, *Population by age and sex, regions of Australia*, 2016 (Cat no. 3235.0).

2. Project Overview

GRC have undertaken a number of research and planning activities related to the proposed BTARC. These are outlined below.

2.1. Previous Planning and Existing Information

Previous planning conducted for the BTARC includes a full feasibility study in 2018. This study considered 11 sites and developed more detailed analysis on three shortlisted sites. Key background information from this study (including existing facility supply and market analysis) has been reviewed for this report.

Recent visitation and financial performance information for the Gladstone Aquatic Centre (GAC) has been reviewed to provide local operating context. Current annual visitation for GAC is circa 130,000 with an operating loss (including management costs) of \$800,000 (\$0.7m revenue against \$1.5m in expenses).

2.2. Community Engagement

Following the feasibility study GRC undertook community engagement in March 2019. The following is an overall summary of the engagement process:

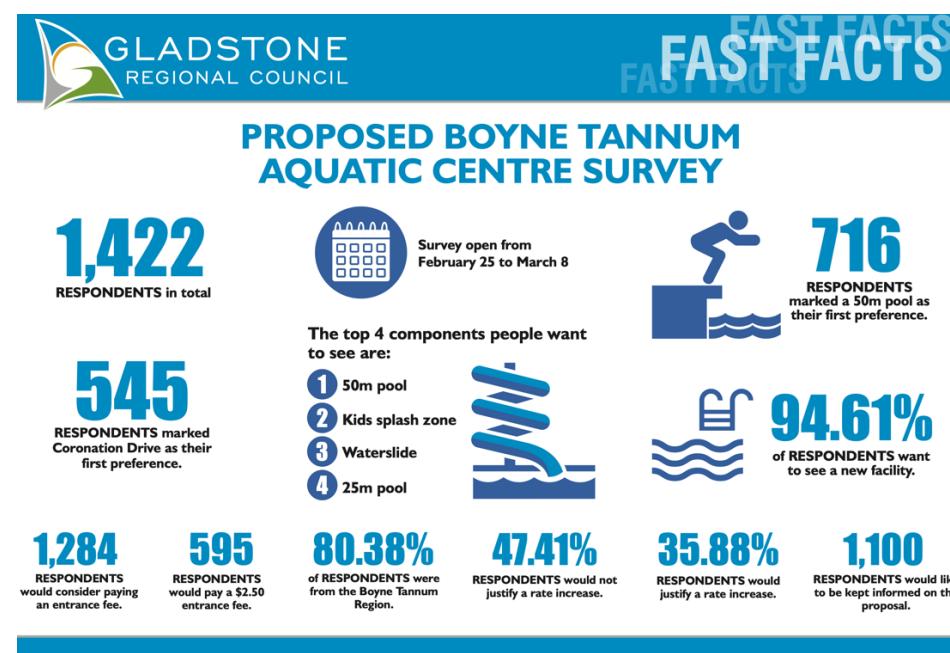
- 1422 Survey Responses received
- 886 on-line
- 536 hard copy
- 12 Submissions received
- 50 (estimate) attended Community Consultation at Boyne Tannum Community Centre

The results of the community engagement showed that of the 1422 survey responders, 94.6% would like a new facility. Of the responders, 80.4% (1143) were from the Boyne Tannum region.

The Survey results (total score) indicate the preferred components the community would like to see in a facility as:

- 50m Pool
- Kids Splash Zone
- Waterslide
- 25m Pool
- Hydrotherapy
- BBQ facilities

GRC summarised the survey results in the following infographic.



2.3. Site Selection

Following the community consultation phase, Cardno was engaged by GRC to complete an options analysis of three (3) potential sites for the future BTARC:

- 10 Canoe Point Road, Tannum Sands
- 3 Hampton Drive, Tannum Sands
- Lot 900 Coronation Drive, Tannum Sands

Cardno completed a comprehensive technical analysis of each site, covering the following matters:

- town planning
- civil engineering
- environment
- traffic engineering
- geotechnical engineering

The analysis from these reports was used to inform an options analysis of the three potential sites, with the preferred site being identified as Lot 900 Coronation Drive, Tannum Sands. The site is formally described as Lot 900 on SP152499 which includes a land area of 99,250m² and has a road frontage to Coronation Drive to the south.

Coronation Drive is an Urban Distributor road with limited direct access. Tannum Sands Road, with which Coronation Drive intersects, is a state-controlled road. The site is presently vacant of improvements or land uses, with extensive mature vegetation present.

The site is located in an established residential area with notable features in the surrounding area including:

- Tannum Sands Shopping Centre, approximately 250 metres north-east of the site;
- Tannum Sands State School, approximately 250 metres north-west of the site; and
- Tannum Sands State High School, approximately 300 metres south-west of the site, which is accessed from the western end of Coronation Drive.

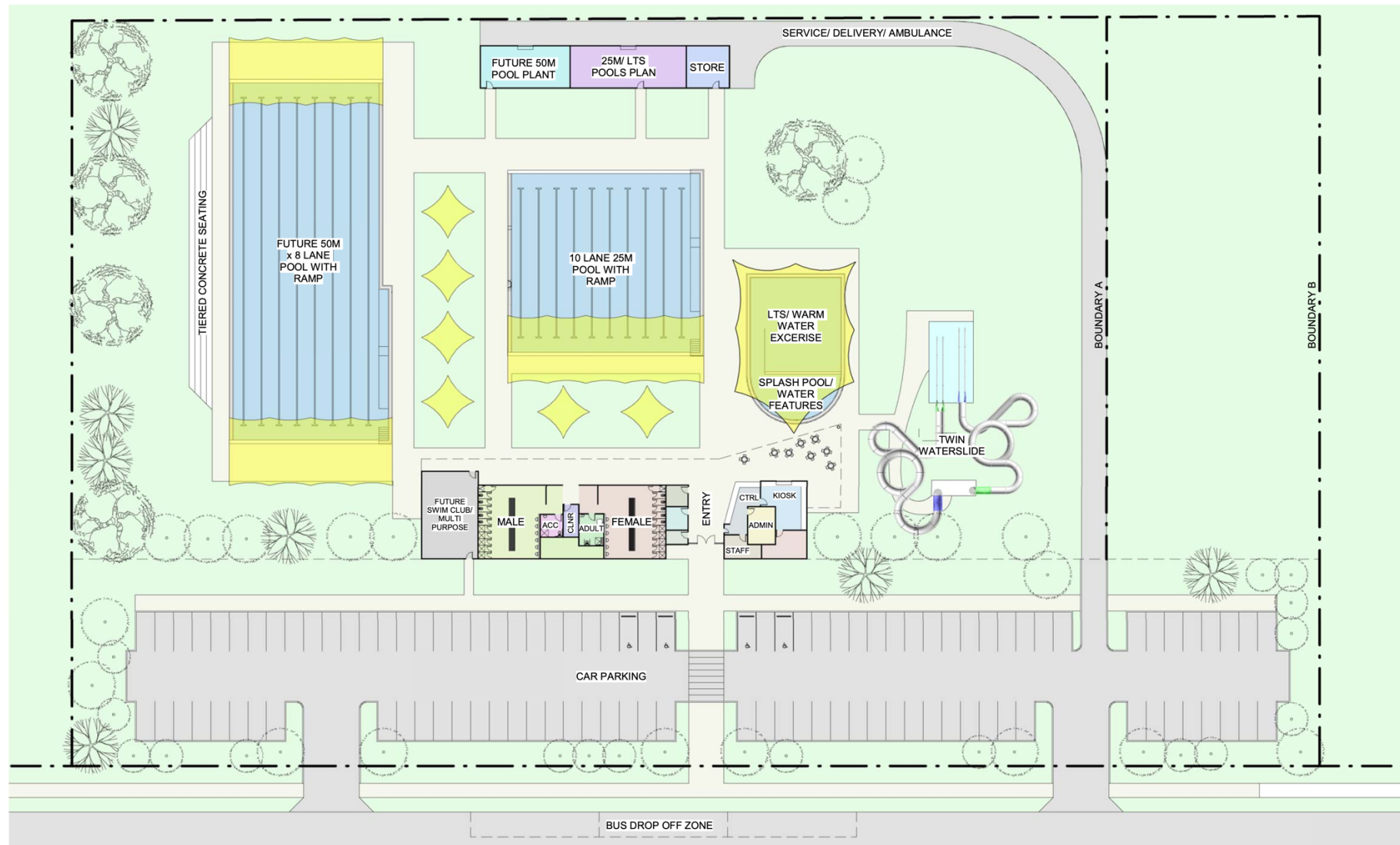
Figure 3 - Preferred site, 20 Dunn Street, Tannum



2.4. Site Masterplan

Facility Design Group have prepared a site masterplan as shown in the figure below. The first stage is expected to include all items with the exception of the 50m outdoor pool and 'future water activities area'.

Figure 4 - BTARC Site Masterplan



2.4.1. Capital Costs

Facility Design Group's opinion of probable costs is shown in the table below.

Table 4 - Opinion of probable costs

COMPONENT	M2/ITEM	COST/M2	TOTAL
a. Services augmentation – electricity, sewer, water, fire	Item	Item	\$ 400,000
b. Earthworks & Excavation for carparking, buildings & pools	Item	Item	\$ 150,000
Sub Total			\$ 550,000
1. Entry foyer, 1st aid, access wc, utility room.	68 m2	\$ 2,500 m2	\$ 170,000
2. Control, kiosk, admin, staff including \$ 60K kiosk fitout	110 m2	\$ 2,200 m2 + \$60K	\$ 302,000
3. Amenities change, adult change	250 m2	\$ 2,900	\$ 725,000
4. Swim club/multi purpose room	100 m2	\$ 2,250 m2	\$ 225,000
5. 10 lane x 25m lap pool	Item	\$ 1,400,000	\$ 1,400,000
6. Shade structure to 25m pool x one	Item	\$ 38,000	\$ 38,000
7. Shallow water splash park with water features + LTS warm water exercise pool.	Item	\$ 700,000	\$ 700,000
8. Shade structure to LTS Pool	Item	\$ 35,000	\$ 35,000
9. Twin Waterslide & associated works.	Item	\$ 750,000	\$ 750,000
10. Store	36 m2	\$ 1,200	\$ 43,200
11. 25M/LTS plant room	96 m2	\$ 1,600	\$ 153,600
12. Filtration plant for 25m + LTS pool	Item	\$ 750,000	\$ 750,000
13. Future 50m pool plant room	72 m2	\$ 1,600	\$ 115,200
14. Filtration plant for 50m pool	Item	\$ 800,000	\$ 800,000
15. New 50 m x 8 lane lap pool.	Item	\$ 2,000,000	\$ 2,000,000
16. Shade structure to both ends of 50m pool	Item	\$ 85,000	\$ 85,000
17. Tiered concrete seating + shade structure	Item	\$ 180,000	\$ 180,000
18. Future water activities expansion.	Item	\$ 1,000,000	\$ 1,000,000
19. Carparking.	3,000 m2	\$ 140 m2	\$ 420,000
20. Landscaping & fencing	Item	\$ 200,000	\$ 200,000
21. Sub Total			\$ 10,642,000
22. Preliminaries over \$ 10,642,000	15%		\$ 1,596,300
23. Contingency over \$ 10,642,000	8%		\$ 851,360
24. Professional Fees over \$ 10,522,000	8%		\$ 851,360
25. Grand Total			\$ 13,941,020

As noted above, it is understood that all items except for the 50m pool and 'future water activities' will be developed in stage 1 of the centre (items 11 - 14).

3. Business Model Assumptions and Inputs

The following tables outline key assumptions for the financial models presented in section 4.0.

Table 5 - Operating business assumptions

Item	Assumption	Source/Basis/Rationale
Facilities	<ul style="list-style-type: none"> - As per the masterplan with the exception of the 50m pool 	<ul style="list-style-type: none"> - Stage 1 Plan
Operating Hours	<ul style="list-style-type: none"> - Summer <ul style="list-style-type: none"> o Monday – Friday 5:30am – 7:30pm o Saturday – Sunday 7am – 5pm o Splash Zone - 8am – 6pm (weekdays), 8am – 5pm (weekends) - Winter <ul style="list-style-type: none"> o Monday – Friday 5:30am – 7:30pm o Saturday – Sunday 7am – 1pm - Splash Zone Closed 	<ul style="list-style-type: none"> - Based on Gladstone Aquatic Centre operating hours
Fees	<ul style="list-style-type: none"> - Casual Aquatic <ul style="list-style-type: none"> o Adult Aquatic Entry \$5.00 o Concession / Child \$4.00 o Children under 3 years FREE o Spectator Fee \$2.70 o Family Pass (1 Adult + 2 Children) \$11.00 o Extra Adult (Family Pass) \$4.00 o Extra Child (Family Pass) \$3.00 - Aquatic Passes <ul style="list-style-type: none"> o 20 Visit – Adult \$90.00 o 20 Visit – Child/Conc \$72.00 o Summer Season Pass (per person) \$160.00 o Winter Season Pass (per person) \$120.00 o Annual Pass \$250.00 - Memberships <ul style="list-style-type: none"> o Adult Monthly \$90 o Child/Conc Monthly \$72 	<ul style="list-style-type: none"> - Based on Gladstone Aquatic Centre fees and charges

Item	Assumption	Source/Basis/Rationale
Visitation	<ul style="list-style-type: none"> - Target visitation estimated at 67,000 <ul style="list-style-type: none"> o Casual Visits - 32,000 o Passes - 14,500 o Events - 4,500 o Programs - 10,500 o Memberships - 6,000 	<ul style="list-style-type: none"> - Based on facility and program offerings, facility catchment profile and industry benchmarks
Management and staffing	<ul style="list-style-type: none"> - Managed and staffed by 7 EFT positions - Assumed management by leisure management firm <ul style="list-style-type: none"> o Allowance for management fee included 	<ul style="list-style-type: none"> - Based on Gladstone Aquatic Centre operating model

Table 6 - General business assumptions

Item	Assumption	Source/Basis/Rationale
CPI Increases	<ul style="list-style-type: none"> - Assumes average 2.3% from year 2 	<ul style="list-style-type: none"> - Consumer price index
Business Growth	<ul style="list-style-type: none"> - Assumes year 3 is base year at 100% <ul style="list-style-type: none"> o Year 1 is discounted by 5% and year 2 is discounted by 2% o Future growth from 100% base: year 4 +1%; year 5 +2%; year 6 +3%; year 7 +4%; year 8 to 10 +5% 	<ul style="list-style-type: none"> - Allows for business establishment period and growth
Price Growth	<ul style="list-style-type: none"> - Allowance of 1% above CPI 	-
Expenditure Increases	<ul style="list-style-type: none"> - Assumes annual expenditure increase as per CPI 	-
Recurrent Operating Expenditure	<ul style="list-style-type: none"> - Recurrent operating expenditure including utilities, administration, marketing, maintenance and cleaning 	<ul style="list-style-type: none"> - Estimated based on similar centres
Staff Costs	<ul style="list-style-type: none"> - Includes salaries and oncosts of 25% - Allows for annual increases of 1.2% above CPI 	-
Asset Management and Renewal Allowances	<ul style="list-style-type: none"> - Assumes annual asset renewal allowance for stage 1 based on asset renewal model shown in Appendix A and capital costs - Renewal expenditure is unlikely to take place until after year 10, the allowance is a budget item to reflect whole of life costs 	<ul style="list-style-type: none"> - Cardno asset planning
Depreciation or Loan Repayments	<ul style="list-style-type: none"> - No allowances for annual depreciation or any loan repayments 	-

4. Operating Model Outcomes

Based on the business model assumptions outlined above, specific project information outlined in this report and other pertinent background information, the following operating forecast has been developed.

Table 7 - Operating forecast

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
General Admission	\$161,143	\$171,755	\$181,085	\$188,973	\$197,186	\$205,736	\$214,636	\$223,901	\$231,561	\$239,484
Passes + Memberships	\$150,377	\$160,281	\$168,987	\$176,348	\$184,012	\$191,991	\$200,297	\$208,943	\$216,092	\$223,485
Events	\$12,350	\$13,163	\$13,878	\$14,483	\$15,112	\$15,768	\$16,450	\$17,160	\$17,747	\$18,354
Aquatic Programs	\$131,993	\$140,686	\$148,327	\$154,789	\$161,516	\$168,519	\$175,810	\$183,398	\$189,673	\$196,163
Café' + Merchandise	\$105,148	\$110,963	\$115,832	\$119,681	\$123,646	\$127,730	\$131,936	\$136,269	\$139,536	\$142,881
Total Revenue	\$561,011	\$596,849	\$628,109	\$654,274	\$681,472	\$709,744	\$739,129	\$769,670	\$794,609	\$820,366
Staff Costs	\$591,612	\$613,229	\$635,378	\$658,058	\$681,548	\$705,877	\$731,074	\$757,170	\$783,911	\$811,598
Operational Expenses	\$348,500	\$356,516	\$364,715	\$373,104	\$381,685	\$390,464	\$399,445	\$408,632	\$418,030	\$427,645
Utilities + Services	\$168,000	\$172,200	\$176,505	\$180,918	\$185,441	\$190,077	\$194,828	\$199,699	\$204,692	\$209,809
Café + Merchandise Exp	\$79,817	\$84,231	\$87,927	\$90,849	\$93,858	\$96,959	\$100,152	\$103,440	\$105,920	\$108,459
Total Expenditure	\$1,187,929	\$1,226,176	\$1,264,525	\$1,302,928	\$1,342,533	\$1,383,376	\$1,425,498	\$1,468,941	\$1,512,554	\$1,557,511
Operating Result	(\$626,918)	(\$629,327)	(\$636,416)	(\$648,654)	(\$661,060)	(\$673,632)	(\$686,370)	(\$699,271)	(\$717,945)	(\$737,145)
Asset Renewal Allowance	\$200,430	\$205,040	\$209,756	\$214,580	\$219,516	\$224,564	\$229,729	\$235,013	\$240,418	\$245,948
Total Result	(\$827,348)	(\$834,367)	(\$846,172)	(\$863,235)	(\$880,576)	(\$898,197)	(\$916,099)	(\$934,284)	(\$958,364)	(\$983,093)

The 10-year operating projections indicate:

- Operating income is expected to increase annually ranging from around \$561,000 in year 1 to around \$820,000 in year 10
- Operating Expenditure is expected to increase annually ranging from over \$1.19m in year 1 to approximately \$1.56m in year 10
- The Centre is expected to result in an annual operating deficit ranging between approximately \$626,000 in year 1 to \$737,000 in year 10
- With the addition of the asset renewal allowance the overall result is expected to range from a deficit of just over \$827,000 in year 1 to \$983,000 in year 10

The table below presents a summary of the operating results per visit (excluding the asset renewal allowance) based on forecast visitation.

Table 8 - Operating visitation and cost summary

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Annual Visits	63,726	65,738	67,080	67,751	68,422	69,092	69,763	70,434	70,501	70,568
Revenue/Visit	\$8.80	\$9.08	\$9.36	\$9.66	\$9.96	\$10.27	\$10.59	\$10.93	\$11.27	\$11.63
Expenditure/Visit	\$18.64	\$18.65	\$18.85	\$19.23	\$19.62	\$20.02	\$20.43	\$20.86	\$21.45	\$22.07
Result/Visit	(\$9.84)	(\$9.57)	(\$9.49)	(\$9.57)	(\$9.66)	(\$9.75)	(\$9.84)	(\$9.93)	(\$10.18)	(\$10.45)

Appendix A - Asset Renewal Model

Asset Name	Item Ref	Component	Useful life (Years)
Entry foyer, 1st aid, access wc, utility room	1	Building - Finishes	30
Entry foyer, 1st aid, access wc, utility room	1	Building - Services	30
Entry foyer, 1st aid, access wc, utility room	1	Building - Fittings	30
Entry foyer, 1st aid, access wc, utility room	1	Building - Substructure	100
Entry foyer, 1st aid, access wc, utility room	1	Building - Superstructure	100
Control/Kiosk/Admin /Staff Building	2	Building - Finishes	30
Control/Kiosk/Admin /Staff Building	2	Building - Services	30
Control/Kiosk/Admin /Staff Building	2	Building - Fittings	30
Control/Kiosk/Admin /Staff Building	2	Building - Substructure	100
Control/Kiosk/Admin /Staff Building	2	Building - Superstructure	100
Amenities / Change/ Adult Change Building	3	Building - Finishes	30
Amenities / Change/ Adult Change Building	3	Building - Services	30
Amenities / Change/ Adult Change Building	3	Building - Fittings	30
Amenities / Change/ Adult Change Building	3	Building - Substructure	100
Amenities / Change/ Adult Change Building	3	Building - Superstructure	100
Future swim club / meeting room Building	4	Building - Finishes	30
Future swim club / meeting room Building	4	Building - Services	30
Future swim club / meeting room Building	4	Building - Fittings	30
Future swim club / meeting room Building	4	Building - Substructure	100
Future swim club / meeting room Building	4	Building - Superstructure	100
25 metre pool	5	Concrete Swimming Pool Structure	100
Shade structure to 25m pool	5	Shade structure	80
Shade structure to 25m pool - Shade Cloths	5	Shade Cloths	15
Kids splash pool	6	Concrete Swimming Pool Structure	100
Hydrotherapy/warm water exercise pool	7	Concrete Swimming Pool Structure	100
Waterslide	8	Concrete Swimming Pool Structure	100
Waterslide	8	Waterslide - Fiberglass	40
Waterslide	8	Waterslide - Structure	80
General Storage	9	Shed - Concrete Incl. floor	40
Swimming Pool Plant	10	Shed - Concrete Incl. floor	40
Swimming Pool Plant	10	Filter and chlorination	30
Supporting infrastructure	15	Carpark - Asphalt	30
Supporting infrastructure	15	Metal Fence	30
Supporting infrastructure	15	Landscaping	10

PPENDIX

F

MAINTENANCE COST ESTIMATE

Asset Name	Drawing Legend No	Component	Useful life	Years	Qty	Unit	Capital Cost with Overhead	Renewal cost (with renewal factor)
Entry foyer, 1st aid, access wc, utility room	1	Building - Finishes	30	years	24	m2	23,500	27,025
Entry foyer, 1st aid, access wc, utility room	1	Building - Services	30	years	24	m2	79,800	91,770
Entry foyer, 1st aid, access wc, utility room	1	Building - Fittings	30	years	24	m2	11,700	13,455
Entry foyer, 1st aid, access wc, utility room	1	Building - Substructure	100	years	24	m2	23,500	27,025
Entry foyer, 1st aid, access wc, utility room	1	Building - Superstructure	100	years	24	m2	96,300	110,745
Contol/Kiosk/Admin /Staff Building	2	Building - Finishes	30	years	110	m2	33,400	38,410
Contol/Kiosk/Admin /Staff Building	2	Building - Services	30	years	110	m2	113,700	130,755
Contol/Kiosk/Admin /Staff Building	2	Building - Fittings	30	years	110	m2	99,600	114,540
Contol/Kiosk/Admin /Staff Building	2	Building - Substructure	100	years	110	m2	33,400	38,410
Contol/Kiosk/Admin /Staff Building	2	Building - Superstructure	100	years	110	m2	137,100	157,665
Amenities / Change/ Adult Change Building	3	Building - Finishes	30	years	240	m2	100,200	115,230
Amenities / Change/ Adult Change Building	3	Building - Services	30	years	240	m2	340,500	391,575
Amenities / Change/ Adult Change Building	3	Building - Fittings	30	years	240	m2	50,100	57,615
Amenities / Change/ Adult Change Building	3	Building - Substructure	100	years	240	m2	100,200	115,230
Amenities / Change/ Adult Change Building	3	Building - Superstructure	100	years	240	m2	410,600	472,190
Furure swim club / meeting room Building	4	Building - Finishes	30	years	96	m2	31,100	35,765
Furure swim club / meeting room Building	4	Building - Services	30	years	96	m2	105,700	121,555
Furure swim club / meeting room Building	4	Building - Fittings	30	years	96	m2	15,500	17,825
Furure swim club / meeting room Building	4	Building - Substructure	100	years	96	m2	31,100	35,765
Furure swim club / meeting room Building	4	Building - Superstructure	100	years	96	m2	127,400	146,510
25 metre pool	5	Concrete Swimming Pool Str	100	years	636	m2	1,934,000	2,224,100
Shade structure to 25m pool - Shade	5	Shade structure	80	years	4	Nos	21,200	24,380
Shade structure to 25m pool - Shade	5	Shade Cloths	15	years	636	m2	31,300	35,995
Kids splash pool	6	Concrete Swimming Pool Str	100	years	30	m2	142,200	163,530
Hydrotherapy/warm water exercise pool	7	Concrete Swimming Pool Str	100	years	174	m2	824,800	948,520
Kids splash pool & Hydrotherapy - Shade	6 & 7	Shade structure	80	years	4	Nos	32,800	37,720
Kids splash pool & Hydrotherapy - Shade	6 & 7	Shade Cloths	15	years	204	m2	15,600	17,940
Waterslide	8	Concrete Swimming Pool Str	100	years	56.25	m2	148,300	170,545
Waterslide	8	Waterslide - Fiberglass	40	years	1	Nos	355,100	408,365
Waterslide	8	Waterslide - Structure	80	years	1	Nos	532,600	612,490
General Storage		9 Shed - Concrete Incl. floor	40	years	30.25	m2	59,700	68,655
Swimming Pool Plant	10	Shed - Concrete Incl. floor	40	years	85.25	m2	212,200	244,030
Swimming Pool Plant	10	Filter and chlorination	30	years	1	Nos	1,036,000	1,191,400
Future allowance for a 50 metre pool - Swimm	11	Shed - Concrete Incl. floor	40	years	66	m2	159,100	182,965
Future allowance for a 50 metre pool - Swimm	11	Filter and chlorination	30	years	1	m2	1,105,100	1,270,865
Future allowance for a 50 metre pool	12	Concrete Swimming Pool Str	100	years	984	m2	2,762,800	3,177,220
Future allowance for a 50 metre pool - Shade	11	Shade structure	80	years	8	m2	54,700	62,905
Future allowance for a 50 metre pool - Shade	11	Shade Cloths	15	years	984	m2	62,700	72,105
Tiered concrete seating	13	Grandstand - Concrete	60	years	168	m2	225,100	258,865
Tiered concrete seating - Shade Structure	13	Shade structure	80	years	4	Nos	17,000	19,550
Tiered concrete seating - Shade Structure	13	Shade Cloths	15	years	168	m2	6,600	7,590
Future water activities expansion	14	Future water activities	50	years	168	m2	1,381,400	1,588,610
Supporting infrastructure	15	Carpark - Asphalt	30	years	3408.75	m2	580,200	667,230
Supporting infrastructure	15	Metal Fence	30	years	422	m	84,000	96,600
Supporting infrastructure	15	Landscaping	10	years	5391	m2	192,120	220,938
Total							13,941,020	16,032,173