



Chewton
SWIMMING POOL

Business Plan

Chewton Pool Inc.
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BACKGROUND

Chewton Swimming Pool was constructed in the 1950s and was officially commissioned in 1959. This followed more than a decade of fundraising by the local community as its contribution to the cost of the facility.

The pool has been operated as a municipal seasonal pool, one of five such facilities in the Mount Alexander Shire.

The pool is sited on Crown Land located adjacent to the Main Rd, Chewton, which is the Pyrenees Highway leading to Castlemaine and Maryborough.

The site is est. 0.5 ha and is located adjoining the Chewton Soldier's Memorial Park, a small playground and the George Archer Pavilion and playing field, which is presently used as a district soccer facility.

Crown Land allotment S690 Section N, Parish of Chewton (13 Fryers Rd)



Infrastructure

The site includes an 18.5 x 8.5m outdoor pool, 11 x 7m learner pool, a 4 x 3m wader pool (currently unused), male and female toilets and change rooms, kiosk, storage facilities, plant room, water storage tanks, water filtration and chemical dosing unit.

These facilities are located in treed grounds, surrounded by weldmesh fencing, with a gravel car park that can accommodate around 20 vehicles.

A condition assessment was completed in July 2010, commissioned by Mount Alexander Shire Council (MASC) to assess the ability of the facility to operate effectively for 10-25 years. The Consultant concluded

“Although the structure has reached its design life expectancy (50 years) it may continue to remain serviceable into the future. The nature of maintenance works at the facility over recent years can be characterised as core maintenance to keep the facility operating in a safe and compliant way. These works have included –

- *Decommissioning of the wader pool*
- *Construction of additional pipework between main pool and balance tank to increase turnover rates*
- *Repair of floor cracks adjacent to side entry steps and deep end of the main pool*
- *Concourse grinding to reduce trip hazards*
- *Installation of new filtration units*
- *Painting of main pool shell.”¹*

A subsequent engineering report from RJ Ball Consulting Engineer (see appendices) was commissioned by Chewton Pool Inc. A Safety Audit was also undertaken by Lifesaving Victoria at the instigation of Chewton Pool Inc. (see Attachment B).

Management History

The Chewton pool has been operated as a municipal pool with the MASC being responsible for maintenance and operational subsidy. This was supplemented by a volunteer committee which was convened under Section 86 of the Local Government Act 1989, which fundraised for additional items (eg: kiosk equipment; outdoor furniture) and provided volunteers to assist in the operations each year. The pool generally is open for 100-111 days per season, opening in early December through to the end of February.

In 2008, the MASC contracted the management of the Chewton, Maldon and Harcourt swimming pools to the YMCA Bendigo region and the Chewton Section 86 Committee of Management disbanded. The committee had struggled to attract sufficient volunteers.

Patronage of the pool had dropped, mainly due to the limited hours of operation during the season introduced under the YMCA contract. While the opening hours were advertised as being 4-6pm on weekdays and 2-6pm on weekends and school holidays, the YMCA did not open due to –

- Temperatures in Bendigo recorded as below 23 degrees C;
- Dosing failures; and
- Lack of staff (lifeguard).

¹ Aquatic Engineering Consultants Pty Ltd, Chewton Pool Condition Assessment and Investigation Report, MASC July 2010

This occurred on at least 25 days when the pool could have been open, severely restricting access to the facility and frustrating families.

In 2009-10 season, patronage was estimated at 1649, a drop from the era of community management, when patronage was recorded at 3,690.

The profile of users of the Chewton Swimming Pool includes –

- Local primary school students for learn to swim classes;
- Families from the Fryerstown, Chewton, Elphinstone, Golden Point and Castlemaine areas;
- Families with small children and older children wishing to supervise both age groups concurrently.

At a Council meeting on 11 September 2007, MASC made a decision to *“Continue to support the current operation of the Chewton Swimming Pool, subject to it being financially responsible to do so, until the opening of a major new, or major renewal of the municipal aquatic facility located in Castlemaine.”*

However, in 2009, Council received a recommendation from consultants involved in a study of the feasibility of an indoor aquatic centre that the Castlemaine, Chewton and Harcourt swimming pools should be closed to support the feasibility of the proposed aquatic centre.

Council undertook to have a condition report prepared on each of these facilities prior to deciding on closures. The condition report on Harcourt indicated it was in reasonable condition. Chewton was deemed to be serviceable in the short term, but unsuitable for a 25 year span.² The condition report of the Castlemaine facility concludes that it is in poor condition and in need of replacement, although closure in the short term was not recommended.

MASC decided to close and demolish the Chewton swimming pool on 27 July 2010, despite the previous decision to retain the pool. No consultation regarding the closure was conducted with the Chewton community. No supervised alternative is available for local swimmers.

In consideration of the concerns of the community, on 28 September 2010, MASC decided further to *“postpone demolition of Chewton pool to no earlier than 1 October 2011 and to negotiate with the Department of Sustainability & Environment to devolve the land and pool to the Chewton community, while responsibility for the Chewton Soldiers Memorial Park remain with Council.”*³

MASC, at its meeting on 22 February 2011, passed the following motion *“that if the Department of Sustainability and Environment accepts transfer of Chewton Pool and supports operation of the pool by a local community organisation, Council provides operational funding of \$25,000 each year, for a period of three years.”*

³ Minutes of Council meeting Mount Alexander Shire Council, 28 September 2010

Policy Context

A strategy from MAP 2020, the Community Plan for the Shire, was to prepare a Recreation Plan for the Shire. This Strategy is under preparation.

MASC has embraced local area planning to recognise the aspirations of smaller communities in the Shire. However, this process has not commenced in Chewton, so no opportunity to place the swimming pool in the context of this community's aspirations and enable the community to work through the issue of renewal/replacement or closure has occurred.

Council Plan pg 10, where there is a commitment to "provide attractive and well-maintained recreational facilities". There does not appear to be any policy in relation to the outdoor pools other than what was adopted in 2007.

In August 2010, MASC adopted the **Loddon Mallee (Southern) Regional Strategic Plan**. This is the State blueprint for our part of the region. Recommendation 2 states *"Improve the liveability of small towns and their ability to manage change through investing in place based community planning, strengthening community leadership models, improving transport connections, encouraging joined up government service delivery and investing in urban renewal (including community hubs, recreation facilities and streetscape enhancement)."*

The incoming Baillieu Government in Victoria has a commitment to –

- Support grass roots sport and recreation clubs to create physically active communities and to nurture talent.
- Increase the skills of volunteers through programs administered by VicSport, peak sporting bodies and the network of Regional Sports Assemblies.
- Improve access and availability to sporting and recreational facilities to promote physically, active healthy communities.
- Continue government support for water safety programs in Victoria such as VICSWIM.

THE MANAGEMENT PLAN

This Management Plan aims to demonstrate the capacity and means by which the Chewton community can manage the facility in the short term as a “serviceable” asset; and how the community proposes to examine alternatives to either renew the facility, or to close the facility once a financially and physically accessible alternative is in operation.

The objectives of Chewton Pool Inc are consistent with this plan, being –

1. To manage the ongoing maintenance and development of the Chewton swimming pool;
2. To manage the seasonal operations of the Chewton swimming pool;
3. To conduct fundraising to support the operations of the Chewton swimming pool;
4. To undertake these activities in the interests of the community.

Proposed Management Model

Chewton Pool Inc will provide management of the Crown Land site as a Crown Land Reserve Committee of Management, working with the Department of sustainability and Environment (DSE) to ensure the site is managed for the recreational use of the community.

Chewton Pool Inc will take responsibility for ensuring the facility is maintained in compliance with RLS Victoria standards for safe operation of the pool. This includes repairs and maintenance as assessed as required for a 5 year operational lifespan.

Chewton Pool Inc. will operate the facility in the Summer season in accordance with RLS Victoria standards and will ensure all aspects of safety and pool operation standards are maintained. Properly qualified staff and volunteers will be employed.

This model resolves MASC concerns regarding risk management related to the asset and its concerns regarding allocation of funds towards an asset deemed beyond its economic life.

This model also recognises the responsibility Council has to its ratepayers to provide services that are accessible and for which the community pays rates.

The model will also provide a means for families to swim in an affordable, accessible and properly supervised facility until MASC resolves the future of aquatic facilities on a shire-wide basis and a realistic alternative is operational.

Capacity of the Chewton Community

The Chewton Community already manages Crown Land and community facilities in partnership with DSE and through sale and/or devolution from local government.

In 1996, the Chewton Domain Society formed to take on management of the Chewton post office, Ellery Park and Chewton Town Hall. In 2008, the Chewton community through the Post Office Hill Action Group, has taken on a significant area of Crown Land to manage in partnership with DSE.

Chewton Pool Inc. formed recently specifically to take on responsibility for managing the Chewton Pool. It has an active committee and over 50 registered volunteers. The organisation has incorporated and is poised to activate its volunteer force, management plan and expertise to manage the facility.

The organisation and the Chewton community have indicated readiness to work in partnership with DSE to ensure a supervised recreation facility is available to local families.

Chewton Pool Inc. has formed sub-committees each tasked with preparing to manage various aspects of pool management requirements, including –

- Future development and funding;
- Staffing and volunteer support and training;
- Facilities maintenance;
- Fundraising; and
- Publicity and promotion.

The Chewton Pool Inc committee consists of 15 committed individuals, the majority of whom operate businesses. The committee is supported by numerous volunteers who have formally registered their time and expertise.⁴

In addition to the committee and volunteers, various business have offered in-kind support including

Elphinstone Wood Supplies	grounds maintenance and landscaping
Tony Bell Excavations	free hire as required
Phil Mawson Concreting	concreting
Graytone Pty Ltd	supply pipe and fittings to replace reticulation line
East End Servo	initial stocking of kiosk
CFMEU	materials and labour for any on-site works

⁴ See attachment – list of committee members and volunteers – Chewton Pool Inc.

In relation to maintenance to the facility to extend its serviceable life for an additional 5 year period, RJ Ball Consulting Engineer has advised the following works would be required –

Item	Cost	Cost with in-kind equipment,labour, materials
- repair of pool concourse	\$30,000	(\$ 8,000)
- scum gutter repair	\$ 4,000	(\$ 3,500)
- reticulation system upgrade	\$35,000	(\$10,000)
- water sanitation – upgrade of pump	\$ 6,000	(\$ 3,500)
Total	\$75,000	(\$25,000)

These repairs will be completed prior to the 2011-12 swimming season commencing. They are not included in the budget for each year ongoing, however an allocation for ongoing maintenance is allowed in each year.

BUDGET

MASC since 2008 has paid a contract to the YMCA for the operation of the Chewton pool. The 2009-10 budget allocation from MASC has been estimated by Council as being \$29,000. In addition to this contract amount, the Contractor retained the admission fees (est \$4,800) and the profits from the operation of the kiosk (est. \$1,200). Any additional capital items valued at more than \$10,000 were to be funded by MASC from its pool maintenance program.

Chewton Pool Inc. proposes to operate the pool at a lower overall cost, while increasing the hours of operation.

The fee schedule proposed is –

Season tickets	\$40 single/\$120 family
Adults	\$4 per visit
Children	\$3 per visit
Concession	\$3 per visit
Spectator	\$1.50 per visit
Group booking	\$60

Opening hours

It is proposed to increase the opening hours of the facility through the supplement of trained volunteer labour. While the paid life guard will be employed for 28 hours per week, it is proposed that the facility be opened for an additional 8 hours per week, with the option for additional hours for group booking/facility hire.

The core opening hours proposed are –

Monday – Friday	2 – 6pm
Saturday	10 am – 8 pm
Sunday	2 – 8 pm

These core hours respond to local consultation which found that the restricted hours of operation caused frustration for local families seeking relief from Summer heat.

Fundraising

A program of donor support includes a weekly wage deduction of \$10 for the period of the swim season of 14 weeks. We anticipate 40 participants in this scheme. This scheme will be on offer to workplaces and for individuals to facilitate regular support for the pool.

The Committee has registered for not-for-profit status with the Australian Taxation Office. This status will enable tax deductible receipts for donations and participation in various charitable fund programs, including the Bendigo Bank Charitable Fund, which facilitates donations and bequests.

Several fundraising events are planned, each of which has a budget and anticipated income target. These include –

- Concerts and entertainments
- Art, wine and business services auction
- Wine sales
- Calendar sales
- Community events

Access to Grants

The Committee is currently exploring several sources of funding towards aspects of managing the pool. There are a number of sources of funding which may defray the costs of pool equipment and operation.

While seeking grants, the committee is also exploring options for longer term sustainability and renewal of the facility.

RISK MANAGEMENT

The basis of managing risk entails –

- Accurate assessment of risks;
- Establishing management processes to minimise and ameliorate risk;
- Comprehensive insurance coverage; and
- Cyclical review of risk factors.

RJ Ball Consulting Engineer has assessed structural risk associated with the facility and Lifesaving Victoria has assessed risk associated with the operating environment of the facility (see Attachment B). Lifesaving Vic has outlined in its Safety Improvement Plan and Observations aspects that need to be addressed. It is the intention of the Committee to request completion of the Safety Audit and Improvement Plan by Lifesaving Victoria once repairs are completed and the facility is ready for opening.

Together with the Safety Plan from Lifesaving Vic and the Victorian Government *Pool Operators Handbook* 2008, a tailored Chewton Pool Management Plan is being developed. This will be used for all aspects of managing the pool, including administration, record keeping, staff training, pool operations and emergency management. Risks outlined in the Safety Assessment will have specific responses and certification of management actions. Regular audit by Lifesaving Victoria is proposed.

Public liability insurance is provided through DSE for the site. Chewton Pool Inc. will provide insurance coverage for property, paid workers and volunteers.

2011-12**ASSETS**

Cash 4,000

INCOME

			60% @ \$3; 40% @\$ 4 x 2,000 visits; 10 group bookings @
1	Entry Fees	7,800	\$60 2,000 patronage
2	Kiosk sales	4,000	
3	Donations	4,000	
4	Fundraising	10,000	
5	Grants	5,000	
6	Operating grant	25,000	MASC
	TOTAL	55,800	

EXPENDITURE

1	Staff		
	lifeguards	7,840	\$20 ph x 36 hrs pwk x 14 weeks. Paid lifeguard 28 hpw
	Pool coordinator	5,000	
2	training & compliance	5,000	\$230 x 4 life guards
			\$165 level 2 first aid x 2
			\$75 x 6 CPR
			\$700 x 2 pool operator
			\$1900 committee management & police checks
		1,400	Lifesaving Vic audit
3	Kiosk	3,500	initial stock of kiosk donated from East End Servo
			20 calls per week reimbursed - use of mobile
4	telephone	200	communications
5	printing & stationery	200	tickets, events
6	insurances	4,600	property, volunteers, WorkCover
7	first aid supplies	300	
8	cleaning supplies	400	
9	maintenance	2,000	supplied by Chewton Pool Inc.
10	chemicals	4,000	
11	minor equipment	1,000	spinal board, neck braces, oxygen - supplied by MASC
12	servicing plant	700	water testing kit
13	grounds upkeep	800	petrol;equipment hire
14	utilities -		
	water	1,300	
	electricity	1,600	
15	Contingency	3,984	10%
	TOTAL	43,824	

2012-13

1	Entry Fees	9,100	patronage increase to 2,500
2	Kiosk sales	5,300	
3	Donations	2,000	
4	Fundraising	10,000	
5	Grants	5,000	
6	Operating grant	25,000	MASC
	Interest		
	TOTAL	57,000	

EXPENDITURE

1	Staff		
	lifeguards	8,240	\$21 ph x 36 hrs pwk x 14 weeks. Paid lifeguard 28 hpw
	Pool coordinator	5 000	casual 10 hpwk @ \$22ph + super
2	training & compliance	2,150	\$230 x 4 life guards
			\$165 level 2 first aid x 2
			\$75 x 6 CPR
			\$75 x 6 police checks
		1,400	Lifesaving Vic Safety Audit
3	Kiosk	4,000	
			25 calls per week reimbursed - use of mobile
4	telephone	300	communications
5	printing & stationery	200	tickets, events
6	insurances	4,700	property, volunteers, WorkCover
7	first aid supplies	300	
8	cleaning supplies	415	
9	maintenance	5,000	
10	chemicals	4,200	
11	minor equipment	200	
12	servicing plant	700	water testing kit
13	grounds upkeep	800	petrol; equipment hire
14	utilities -		
	water	1,300	
	electricity	2,000	
15	Contingency	4,090	est 10%
	TOTAL	44,995	

2013-14**INCOME**

1	Entry Fees	10,120	patronage increase to 2,800
2	Kiosk sales	5,800	
3	Donations	2,000	
4	Fundraising	10,000	
5	Grants	5,000	
6	Operating contract Interest	25,000	MASC
	TOTAL	58,510	

EXPENDITURE

1	Staff		
	lifeguards	8,625	\$22 ph x 36 hrs pwk x 14 weeks. Paid lifeguard 28 hpw
	Pool coordinator training & compliance	5,050	casual 10 hpwk @ \$23ph + super
2		2,120	\$230 x 4 life guards \$165 level 2 first aid x 2 \$75 x 6 CPR \$75 x 6 police checks \$150 x 2 HACCP online
		1,400	Lifesaving Vic audit
3	Kiosk	4,500	
	telephone	300	25 calls per week reimbursed - use of mobile communications
5	printing & stationery	250	tickets, events
6	insurances	4,840	property, volunteers, WorkCover
7	first aid supplies	300	
8	cleaning supplies	430	
9	maintenance	8,000	
10	chemicals	4,320	
11	minor equipment	200	
12	servicing plant	700	water testing kit
13	grounds upkeep	825	petrol;equipment hire
14	utilities -		
	water	1,350	
	electricity	2,300	anticipate a 15% increase
	contingency	4,550	10%
	TOTAL	50,060	

2014-15**INCOME**

1	Entry Fees	10,460	patronage increase to 2,900
2	Kiosk sales	6,000	
3	Donations	2,000	
4	Fundraising	10,000	
5	Grants	5,000	
6	Operating contract Interest	25,000	MASC
	TOTAL	58,860	

EXPENDITURE

1	Staff		
	lifeguards	8,820	\$22.50 ph x 36 hrs pwk x 14 weeks. Paid lifeguard 28 hpw
	Pool coordinator training & compliance	5,360	casual 10 hpwk @ \$23.50ph (14% super)
2		3,600	\$240 x 4 life guards \$180 level 2 first aid x 2 \$80 x 6 CPR \$80 x 6 police checks \$150 x 2 HACCP online \$750 x 2 x pool operator
		1,400	Lifesaving Vic Audit
3	Kiosk	4,700	
			25 calls per week reimbursed - use of mobile communications
4	telephone	330	
5	printing & stationery	250	tickets, events
6	insurances	5,000	property, volunteers, WorkCover
7	first aid supplies	300	
8	cleaning supplies	375	
9	maintenance	8,000	minimum \$3,000 est by MASC as per Newstead
10	chemicals	4,500	
11	minor equipment	200	
12	servicing plant	700	water testing kit
13	grounds upkeep	850	petrol; equipment hire
14	utilities -		
	water	1,400	
	electricity	2,530	anticipate a 10% increase
15	Contingency	4,832	10%
	TOTAL	53,147	

Chewton Pool Inc Management Committee

NAME	POSITION
Tony Shaw	President
Fritz Hammersley	Vice President
Rose Darling	Assistant Secretary/ Public Officer
Bruce Newman	Treasurer
Helen McGeachin	Minutes Secretary
Gabrielle Posetti	Committee member
James Darling	Committee member
Mike Grinter	Committee member
Ian (Locka) McMillan	Committee member
Darren (DJ) Hall	Committee member
Ro Luke	Committee member
Kerry Bourke	Committee member
Jill Carter	Committee member
Phil Carter	Committee member
Lisa Candy	Committee member
Lily Fermer	Committee member
Joan Taylor	Committee member

APPENDIX A

REPORT ON THE CHEWTON POOL

RJ BALL ENGINEERING

NOVEMBER 2010.

RJ BALL CIVIL ENGINEER

REPORT ON THE CHEWTON SWIMMING POOL

Introduction

This report has been prepared at the request of Chewton Pool Inc following a brief inspection on the 16th of November 2010, which included Mr Tony Shaw and a number of his colleagues from Chewton Pool Inc.

The various features of the pool(s) were discussed. Some of these features related to aspects identified within Reference 1(Aquatic Engineering Consultants Pty Ltd).

The principal purpose of this report is to outline the various measures, and the basis for those measures, that might be introduced at the pools to overcome any real or perceived issues that could possibly impact on public safety.

All of this is based upon the scenario proposed by the Business Plan for the Chewton Swimming Pool, prepared by Chewton Pool Inc (Reference 5), whereby the pool would be operated for a further five years. ie. assuming a further five-year service life for the facility.

The Issues

1. Safety and the Pool

(a) One of the principal matters of concern would appear to be the presence of exposed and corroded reinforcing steel associated with the scum gutter on the eastern side of the main pool. This is indicated by the presence of small pieces of mortar on the gutter lip coming away from the formed and poured section of the scum gutter.

In addition, approximately 100 mm down from the lip of the gutter, there is evidence of a delaminating effect occurring in the eastern main pool wall (or part thereof), caused by the expanding corrosion products of the deteriorating reinforcing steel. The length of the delamination is estimated to be approximately 6 m in length, measured parallel to the pool wall.

The reason for the observed deterioration is mainly due to inadequate concrete cover from the exterior of the concrete to the surface of the reinforcing steel.

See also Reference 1.

The effects observed are a common phenomenon in older pools, often seen at the corners of rectangular pools in the pediment section above the concourse level, and sometimes also associated with the scum gutter.

Reference 3 "Guide to Concrete Repair and Protection" contains a clear description of the electrolytic mechanism at work in this form of deterioration. (and other factors).

A relevant extract of Reference 3 is reproduced as appendix A.

It is well-known that this mechanism is accentuated in areas of high relative humidity with frequently changing moisture conditions; commonly known as the splash zone (derived from its common occurrence in marine structures); hence the effects in the positions noted in this pool.

It is considered that the observed defects are unlikely to proceed far below the immediate splash zone area into the general wall area, at least in what would appear to be a relatively early stage for this type of deterioration.

Certainly it would not be expected that in the five-year service life extension (with appropriate protection measures) deterioration would proceed to an extent that there would be a fundamental threat to the pool serviceability.

This view is supported by the concrete chemistry results reported in Reference 1.

These suggest that the concrete in areas other than the splash zone have parameters that are not favourable to the development of corrosion in the reinforcing steel.

In particular, the pH values of the concrete pore water suggest that it remains in a passivated state. ie.alkaline concrete pore water assists in providing a stable film over the steel, virtually preventing the corrosion electrolysis from proceeding.

The splash zone problems are also associated with a loss of sections of mortar occurring around the delaminated concrete sections.

At the time of the construction of this pool it was very common to finish off sections like the scum gutter lip by using a mortar mix laid on to the formed and poured section of concrete. Typically this mortar mix was of relatively low strength due to a high water to cement ratio and a low cement to sand ratio which would result in a higher porosity than would be the case in the parent concrete.. This also provides a means for ingress of chlorides into the reinforcing steel.

Although in this case it has taken some 50 years for the present position to develop, it is not unusual for the mortar to lose adhesion to the parent concrete and to come away in sections; generally assisted by temperature cycling causing shear stress development along the mortar/concrete contact line, and volume changes associated with the steel corrosion.

Because it is likely that other sections of the scum gutter lip are similarly affected, the extended service life envisaged by the Business Plan will require some vigilance to identify and remove sections at risk. A yearly inspection would be sufficient.

This leads to consideration of possible treatments that are capable of supporting the five-year extended service life. The traditional means of dealing with the corroding steelwork problem is to sawcut away the offending sections, and reform the front section of the scum gutter at the sections where the delamination is occurring. The technique includes drilling into the underlying parent concrete and inserting reinforcing rods into that concrete, providing continuity from the new section to the existing concrete wall.

A high strength polymer modified concrete would be used to form up the new section of the scum gutter.

Opinion of Cost \$4,000.

A close examination of the mortar topping elsewhere should reveal any sections likely to become detached. These may be removed and replaced with the polymer modified concrete mortar. It would be suggested that the scum gutter lip on both sides of the pool should be examined, thus eliminating the possibility of further sections coming away.

This is on the basis that it is most likely that all of the scum gutter area will eventually be affected in a similar way to the areas evident on the eastern wall.

However, this is not expected within the five-year extended service life period.

Another method of protecting against any concrete work coming away would be to place a folded stainless steel sheet over the front and top of the scum gutter lip, fixed to sound concrete with stainless steel countersunk screws.

Chewton Pool Inc intends to give consideration to this method. It is likely to be more expensive than the cut and replace approach, but would clearly contain and confine any possible breakaway in the scum gutter area.

For the reasons outlined, it is considered that the concrete deterioration associated with the scum gutter area is not a factor in the overall stability and safety of the pool tank. Given the “splash zone” effects, delamination is most unlikely to proceed more than the depth to which the current deterioration is evident.

Since the depth of water is minimal to this level, it follows that the loading on this part is also minimal (loading being linearly dependent upon depth of water being retained). The treatments outlined are about controlling any breakaway of material that might occur from this part of the pool, causing abrasions from exposed steel.

(b) It might also be that there is some perception of hazard arising from the apparent absence of some of the reinforcing steel in the eastern wall of the main pool.

Of course any evidence of the possibility of missing steel in the wall is of concern, mainly on the grounds of structure longevity and ability to function as a water retaining structure.

It should be noted that there is unlikely to be a connection with this aspect and the defects existing in the scum gutters.

It is clear however that the structure has stood for some 50 years with no visual evidence of crack systems in the walls of the main pool. (With the exception of minor cracking in two or three areas, which appear to have had light but sufficient repairs).

It is most likely that there is micro-cracking in the walls; these are most unlikely to be significant within the five-year extended service life (or beyond).

The extent of apparent reinforcement absence in the wall is difficult to quantify from the available evidence, and has not been reported as being verified by intrusive methods.

The technical references cited in this report provide some insight into crack formation in reinforced concrete. Namely Reference 2 (Guide to Concrete Repair), and also Reference 3 (Concrete Cracks – In the Eyes of the Repairer).

It is perhaps best put in Reference 3;

“Significant damage to a concrete structure by whatever cause invariably manifests itself in cracking with or without spalling. Deterioration of concrete may be concealed at the beginning, but the first visible sign of distress is again cracking. Examination of the crack pattern often provides an important clue to the causes and the severity of the problem at hand.”

And,

“cracks develop in concrete whenever and wherever the tensile stresses exceed the tensile strength (of the concrete) at that time.....cracks in hardened concrete are caused by overloading of the structure, foundation movement, fire attack or long and continued exposure to an unfavourable environment.”

The apparent contradiction in the concrete wall behaviour versus the available evidence on the quantity of steel reinforcement and areas of low concrete strength is not unexpected in a structure such as a pool that may never experience the assumed design loads from the interaction of the concrete walls and the retaining soil, along with the degree of (structural) determinacy of a pool tank.

Some factors that might also be relevant include:

- wall thickness is not necessarily known in the sections being considered, nor is the extent of the quoted variations in the steel reinforcement throughout the main pool.
- the size and shape of the pool may be significant. The ratio of the length of the main pool to its width is unusually small at a little over 2:1, and its overall footprint is likewise small.
- a reasonable conjecture might be that the overall structure may be stiffer than normal, with bracing effects afforded by the corner structures, and some distribution of external loads as a consequence.

Interestingly, there is no evidence of cracking or structural deficiency at the corners of the pool (excepting where associated with the step entry at the shallow end).

It is quite common to observe cracking in older pools in the corner areas, especially at the deep end, which is usually put down to inadequate reinforcement and/or a settlement effect.

A reasonable conclusion drawn from these factors is that there is very little risk arising from this source, especially in the 5 year extended service life scenario.

2. The Pool Concourse

The concourse around the main pool has a number of settlement points and has some areas where there are differential levels between adjoining slabs. In addition, the width of the concourse is less than the current requirements of the Royal Lifesaving Society.

In the case of the intermediate pool, there is existing brick paving concourse which is not user-friendly and has a number of surface discontinuities. In particular there is a concourse drainage entry point which could be regarded as a trip hazard.

It is the intention of Chewton Pool Inc to replace the existing concourse throughout, in order to eliminate the trip-points and to rationalise the concourse area, especially in the area between the intermediate pool and the main pool.

This work would be done in order to achieve the requirements of RLSSA, and would be part of the start-up works to prepare the facility for the commencement of the projected five-year extended service life of the facility.

Opinion of cost \$30,000

3. Pool Water Sanitation

Reference 1(Aquatic Engineering Consultants) identifies certain matters concerned with this issue.

The broader question of achieving adequate pool water sanitation has a number of facets to it.

This report will consider these aspects in parts.

(a) Turnover rates of pool water

There are recognised standards for swimming pool turnover rates (the time taken for an equivalent quantity of water to the contained volume in a pool tank to pass through the treatment process). These standards usually also recognise the use profile of an individual pool.

In the upgrade of a swimming pool, it is necessary from time to time to arrive at a compromise in the turnover rate that can be achieved, simply due to physical restrictions that cannot be realistically overcome.

Nevertheless, it is a critical aspect to maintaining adequate public water safety standards.

In the case of this facility, there appears to be significant constriction on turnover as a consequence of the capacity of the main circulation pump, and the ability of the pool water reticulation system to convey the circulating water at sufficient rates.

(b) The circulation pump and the water treatment processes.

The pump is of a reputable brand, powered by a 3 kW electric motor. Reference to the pump performance curve suggests that this pump is unlikely to produce more than 20 L per second.

Based on a rapid assessment of the turnover rates that would be generated by this flow, the installation of a larger pump is required, probably of the order of 5.5 KW power. This would be suggested as a high priority within the 5 year extended service life period.

Opinion of Cost \$6000

The water filtration process is currently adequately provided by the existing filters. These filters are fairly conservatively loaded, and the flow increases envisaged are within the range of these filters.

Likewise the chemical disinfection treatment and pH correction are quite capable of continuing unaltered.

(b) the reticulation system needs to be carefully assessed, and deficiencies eliminated.

There are two distinct categories of reticulation:

Filtered Water Return (FWR)- operates under pressure generated by the circulation pump. Sometimes inadequacy in pipe sizes can be at least in part compensated by the pressure developed by the circulation pump.

In effect, a balance must be struck between pipe sizing and pump pressure, along with flow splits between the two pools.

Soiled Water (SW) return from the pools to treatment- operates under gravity. This may be the Achilles heel of the system.

For the main pool, outlet from the pool tank occurs via the scum gutters and a single outlet port in the deep end wall at the western corner, thought to be 150 mm diameter. The scum gutter outlets have a very low capacity.

For a more balanced circulation flow, a second outlet in the eastern corner would be warranted, which in turn would be likely to provide a sufficient outlet capacity for the flows required to maintain an adequate water turn-over in the pool.

In the case of the intermediate pool, the outlet system consists of 3 No skimmer boxes of quite limited capacity. This pool has been built along the lines of a domestic pool, which commonly incorporate this form of outlet. Typically, the skimmer boxes in these circumstances operate under suction from the circulation pump.

In this case, the skimmer boxes operate under gravity and a preliminary inspection shows that the outlet pipes to these units may be smaller than could take off the required SW flow rates from this pool. The change from suction operation to gravity flow invariably results in decreased outflow capacity.

It is expected that these outlets would need to be addressed.

Chewton Pool Inc undertakes to investigate and quantify the details of the reticulation piping system, design a reticulation suitable for the various flow rates required to achieve adequate water circulation, and to install it.

Opinion of Cost \$30,000

To thoroughly investigate the reticulation, the intention would be to utilize Closed Circuit TV with a miniature camera to describe the condition, size, and location of the pipework. This would be one of the tasks involved in establishing the five-year extended service life period.

Opinion of Cost \$3000

Establishing and maintaining proper pool water sanitation in the pools may well be the primary task required for ensuring the public safety.

Some Project Precedents

It may be of interest to relate two instances of swimming pool rehabilitation that may have some relevance to the issues surrounding the Chewton Swimming Pool.

(a) Pakenham 50 m outdoor swimming pool

This pool went out of service for approximately 3 years on the grounds that it was beyond its service life and was subject to severe leakage.

It was a project subject to no little local controversy, but finally the democratic process prevailed and a rehabilitation project was set in hand in 2007.

The pool tank had a number of crack systems throughout, most of which were sealed using pressure injection of a flexible polyurethane material. One set of the entry steps had become almost detached from the pool tank through settlement. A piling system was installed to support the reinstated section of the pool. A wet deck system was installed adapting the existing soiled water side channels for that purpose.

The water treatment and hydraulics system were completely replaced, including the installation of an innovative precast concrete balance tank.

The contract for this work was undertaken by Farley Pools Australia and the crack system design, water treatment and hydraulics design by RJ Ball Civil Engineer.

(b) Echuca 50m Outdoor to Indoor Pool Conversion.

This project was undertaken in 1997, and included the rehabilitation of the existing pool shell.

The pool shell was in poor condition, and as a consequence the existing shell was adapted to provide for new concrete structural additions designed to meet the standards of the day. The retention of the existing pool shell was critical to the cost control of the overall project.

This experience may be particularly relevant if the service life is extended beyond the current projections.

Concluding Remarks

This report has endeavoured to put some engineering perspective on any public risk that might arise from a continuing operation of the facility.

It is considered that the Chewton Pool Inc proposal for an extended service life of five years is highly significant, as it effectively caps the likely extent of any continuing deterioration of the pools. This may occur in the scum gutter area and would require vigilance during the 5 year period, and attention to repairs where necessary (these are a routine pool repair).

Nevertheless, in the event of circumstances indicating a service life beyond 5 years, the Echuca model provides evidence of a means by which the structural issues being considered at Chewton can be more than adequately addressed on a long term basis.

It is submitted that sufficient information has been provided to allow on any reasonable view of the available data, the public risk on structural grounds is quite minimal, provided the measures listed are adopted.

Public risk implies the possibility of a catastrophic event taking place.

A comparison may be drawn between a highway bridge with a dynamic loading which is not always accurately known, and the failure of engineering systems that can lead to a catastrophic result.

By contrast, the typical swimming pool of the type being considered is under static loading, which being from water pressure for the most part is accurately known.

With a known history of performance under this loading and no signs of distress, a catastrophic event is considered most unlikely.

In my opinion, this facility could be safely operated for at least the projected period of service of 5 years as a minimum.

Ray Ball for RJ Ball Civil Engineer.

12th November 2010

References

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3. Art. in Australian Concrete Construction June 1992. Concrete Cracks in the Eyes of the Repairer. Author H W Chung.
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Appendix B

Risk Assessment and Management Plan: Chewton Swimming Pool

Appendix C

Scheduled of Works to be conducted prior to pool opening

REPAIR	DESCRIPTION	COST ESTIMATE
Scum Gutter	New sections inserted with polymer modified concrete attached to main structure	4 000
Concourse	Replace to RLSAA standards	30 000
Water turnover	Replace pump with 5.5kw pump	6 000
Reticulation	Test and replace pipe work	35 000
Total		75 000

APPENDIX B

CHEWTON POOL SAFETY ASSESSMENT AND IMPROVEMENT PLAN

LIFESAVING VICTORIA

NOVEMBER 2010