



PORT **STEPHENS**
COUNCIL



Public **swimming pool** and spa pool

Information booklet





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1 What is a public swimming pool or spa pool?

A public swimming pool or spa pool are pools to which the public is admitted, whether free of charge, on payment of a fee or otherwise, including those located at clubs; workplace; hotel, motel or guest house or at holiday units, or similar facility, for the use of guests; or at a school or hospital. It does not include pools situated at private residential premises (unless such a pool is used by members of the public, i.e. learn-to-swim pools).

Additionally, a spa pool includes any structure (other than a swimming pool) that:

- (a) holds more than 680 litres of water, and
- (b) is used or intended to be used for human bathing, and
- (c) has facilities for injecting jets of water or air into the water.



2 Why test **pools** and **spas**?

Residents and visitors are attracted to Port Stephens because of its natural beauty, magnificent waterways and rural character. Port Stephens is used extensively for tourism and recreation, with the use of swimming pools and spas a favourite recreational activity. As swimming is an activity accessible to virtually everyone, public pools are enjoyed by people of all ages in a variety of different settings, including hotels, resorts, caravan parks, motels and bed and breakfast accommodation. It is vitally important that these facilities are managed well.

Water can be a favourable environment for many different types of pathogens such as viruses, bacteria, fungi, amoebae, cysts and other parasites to thrive. Dirty pools, warm pools, aerated pools, pools with too little disinfectant, pools with too much stabiliser and chlorine disinfected pools where the pH is too high (or a combination of all of these) can easily lead to infection transmission. The physical, chemical and bacteriological properties in a swimming pool all need to be managed and these change constantly. Some of these changes take place in seconds, others in hours or days, so it is important that good management practices are in place to allow operators to understand and react to these changes.

Due to potential public health risks from pools the Public Health Act 2010 (the 'Act') and associated regulation were introduced in New South Wales in recent years which introduced prescribed operating requirements for public swimming pools and spa pools. These cover matters such as temperature, disinfection systems, disinfection concentrations, pH, alkalinity, testing and record keeping. These are all things that pool operators must understand as without knowledge in these areas the risks to pool users increase greatly. These are the things Council will be checking as part of the swimming pool inspection program. Full details on the operating requirements are available on NSW Health Website.

3 Do **pool** operators need to carry out their own **tests**?

Yes! All persons operating a public pool must undertake:

- Chemical testing
- Verification monitoring for pools deemed higher risk
- Keep records (minimum six months) showing the above

The types of chemical tests and parameters are outlined in Table 1 (on the final pages) of this information booklet. The frequency of chemical testing is shown in Table 2.

The type and frequency of verification monitoring is shown in Table 3. Sampling for verification monitoring will need to be sent to an accredited laboratory for testing.

Important: taking a sample of the pool water to the local pool shop is not an appropriate testing regime for a public pool. While this is okay for a home pool, the onus on ensuring the water quality in public pools is much higher. It is therefore important that each operator of a public pool has the appropriate equipment and knowledge to ensure the tests are done correctly.



4 What equipment will I need to test the pool water?

The best type of water testing equipment for chemical levels is a laser equipped machine known as the photometer. The photometer can test water samples for levels pH, Alkalinity and disinfectant. For each test indicator tablets are dissolved in the samples, which are then inserted into photometer. A laser then passes through the sample and displays the levels of the chemical being tested on the screen. You can then compare these levels with those in the prescribed operating requirements (and shown in Table 1). If the results show a problem, this indicates that something will need to change in the operation of the pool.

There are other devices that will allow you to test the water quality. Photo spectrometers are devices capable of providing accurate and fast readings for the levels of disinfectant. Domestic pool kits and test strips are not recommended for public swimming pools and spa pools because they are not as accurate.

The equipment listed above cannot test microbiological levels. These will need to be sent off to an accredited laboratory capable of testing for the indicative organisms listed in Table 2.

5 Where should I sample the water from?

Water should be sampled from a depth of at least 450 mm using an inverted plastic (not glass) beaker in a location away from the pool inlets (returns). A water sampling point closer to the outlets, gutters or wet deck return should be selected because it represents the quality of the water leaving the pool. The plastic beaker should be rinsed in the pool water, emptied and then the sample taken by plunging the inverted plastic beaker into the pool, inverting and lifting in the one scooping motion in the direction opposite to the water current. Water samples for chemical testing should be tested immediately after collection.

6 What disinfection system should the pool have?

To prevent the spread of infections, you need to add a chemical to the water to reduce microorganisms to a safe level. The chemical must be able to rapidly destroy microorganisms in the water and oxidize chemical pollutants, without harming people. All public pools must be disinfected with either a chlorine or bromine compound as these are the most effective chemicals that can be safely used in a swimming pool or spa.

The prescribed operating requirements under the Act state that the disinfectant provided to all public pools must be supplied via either:

- An automated disinfectant dosing system; or
- A continuous metered disinfectant dosing system

An automatic dosing system uses probes to detect disinfectant levels or activity. This information is fed back to a controller which automatically adjusts the dose rate of the continuous metered dosing system. There are various levels of sophistication with automatic dosing systems which may include data logging, and download capabilities.

A continuous metered disinfectant dosing system is a device or apparatus which delivers the disinfectant in a controlled continuous and steady rate. A good example of this is a pump, which delivers liquid chlorine at a particular rate i.e. millilitres per hour. One of the cheapest forms of this dosing system is a peristaltic pump. Peristaltic pumps draw liquid chlorine (sodium hypochlorite) from a drum and slowly inject the disinfectant into the pool circulation system after the filter. Continuous

metered disinfectant dosing systems can also be controlled by a timing switch to activate it at some time prior to opening and de-activate it at some time after closing. The dosing rate or frequency on some pumps can be varied allowing the pool operator greater scope in delivering disinfectant to the pool at varying continuous rates. Other examples include dry chemical feeders and electrolytic disinfectant

7 What is an unacceptable disinfection system?

Hand dosing or broadcasting disinfectant into the pool water is not an acceptable system. Similarly, floating blocks of disinfectant or erosion feeders are not acceptable as they are unlikely to be capable of delivering the disinfectant at a constant continuous rate.

8 Does appropriate disinfection make the pool water completely safe?

Unfortunately, the answer is no. While most harmful microorganisms are killed off by disinfection, *Cryptosporidium* oocysts and *Giardia* cysts, which are types of spores, are resistant to disinfectants. The only way to stop these spores entering the pool water is by effective management of the pool, including good hygiene practices (ensuring people use toilets/shower before entering the pool; non-toilet trained infants using dedicated infant pools); education (posters reminding of good hygiene practices) and pool management (closure procedures; superchlorination of the water; effective filtration systems).

It is recommended that all public pools be superchlorinated (i.e. maintaining a minimum of 10mg/L of free chlorine in the water for 8 hours) at least every 14 days.

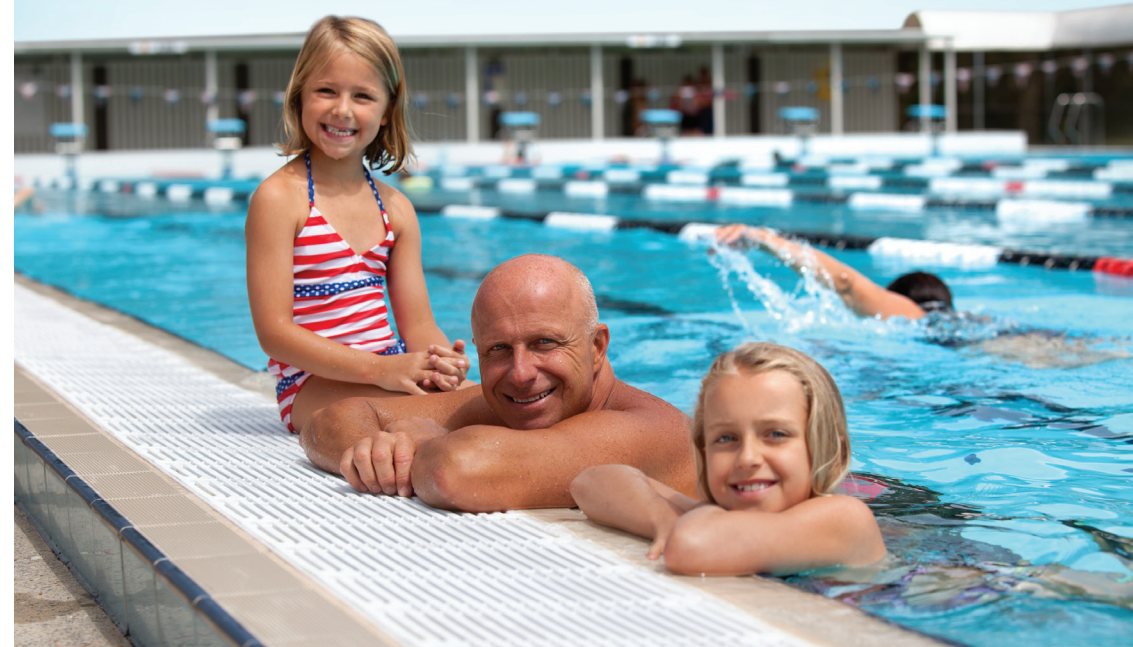
More information on the control of *Cryptosporidium* and *Giardia* is available here: <http://www.health.nsw.gov.au/environment/factsheets/Pages/swimming-pool-crypto.aspx>

9 What training do I need to operate a pool?

Any person looking after the operation of a public pool must have sufficient knowledge in regard to the prescribed operating requirements defined by the Act and the safe operation of the pool. It is extremely important to understand when a problem occurs and what needs to be done to resolve this.

There are a number of formal swimming pool operator qualifications which can be attained through the completion of units / modules of study delivered by Registered Training Organisations (RTOs) such as the NSW Department of Technical and Further Education (TAFE). RTOs and the units / modules of study must be recognised (accredited) by the Australian Skills Quality Authority. There are private RTOs that also offer accredited training courses.

Operators should continually seek to develop their professionalism through attendance at appropriate conferences and short courses.



10 Who from Council will be inspecting and testing pools?

Public pools in Port Stephens will be inspected and tested annually by Environmental Health Officers (EHOs). EHOs are authorised under the Act to inspect and take appropriate measures to ensure compliance. Inspections of pools will involve physical and observational checks, as well as testing of the water using a photometer to ensure compliance with the prescribed operating requirements. The temperature of pool/spa water will also be tested to ensure that chemical balances are not adversely affected. EHOs will also make checks on record keeping for the management of the pool.

11 What happens if pools do not meet the prescribed operating requirements?

If following inspection it is found that a public pool is not meeting the prescribed operating requirements, EHOs have a number of options to address the issues found, including:

- Warning letters – for non-serious issues
- Improvement Notice served under sections 41 and 42 of the Act – for serious issues, but where there is no serious danger to public health
- Prohibition Order served under section 45 of the Act – for matters where there is an imminent and serious danger to public health

Where a Prohibition Order is served, the pool would need to be immediately shut down and not be operated until a Certificate of Clearance is issued. A Certificate of Clearance would only be issued if an authorised officer is satisfied, after an inspection of the premises subject to the order, that there is no serious danger to public health.

EHOs also have the option of issuing fines. If an occupier of any premises at which a public swimming pool or spa pool is situated fails to ensure that the prescribed operating requirements are complied with, the occupier is guilty of an offence carrying a maximum penalty of 100 penalty units (for an individual) or 500 penalty units (for a corporation).

Pool operators can also be fined (maximum penalty of 100 penalty units), imprisoned for up to 6 months (or both) for:

- Allowing someone to use a pool which has not been disinfected in such a way as to minimise the transmission of disease.
- Failing to ensure that the pool surrounds, including any toilets or change rooms, are kept clean and in such condition as to minimise the transmission of disease.

EHOs can also issue Penalty Infringement Notices for failures under the Act.

12 Do public pools need to be registered with Council?

Yes. All public swimming pools and spa pools need to be registered with Council. Registration is easy – simply complete the registration form and once this has been received the premises will be lodged on the public pool database.

Any person(s) found to be operating a public pool without having notified Council could be liable for a fine of a maximum 10 penalty units.



13 Further information:

- New South Wales Health understanding public swimming pool and spa pool issues:**
<http://www.health.nsw.gov.au/environment/publicpools/Pages/default.aspx>
- Public Swimming Pool and Spa Pool Advisory Document**
<http://www.health.nsw.gov.au/environment/Pages/Swimming-Pool-and-Spa-Advisory-doc.aspx>
- Public Health Act 2010**
<http://www.legislation.nsw.gov.au/maintop/viewinforceact+127+2010+cd+0+N>
- Public Health Regulation 2012:**
<https://legislation.nsw.gov.au/view/html/inforce/current/sl-2022-0502>

Table 1 – Chemical parameters

Parameter	Situation	Criteria*
Free chlorine**		
pH < 7.6	Indoor pool	Min. 2.0 mg/L
	Outdoor pool without cyanuric acid	Min. 1.0 mg/L
	Outdoor pool with cyanuric acid	Min. 3.0 mg/L
pH ≥ 7.6	Spa pool	Min. 2.0 mg/L
	Indoor pool	Min. 3.0 mg/L
	Outdoor pool without cyanuric acid	Min. 2.0 mg/L
Outdoor pool with cyanuric acid	Min 4.0 mg/L	
Spa pool	Min. 3.0 mg/L	
Combined chlorine	Chlorine disinfected pool	Max. 1.0 mg/L
Total chlorine	Chlorine disinfected pool	Max. 10.0 mg/L
pH	Chlorine disinfected pool	7.0 – 7.8
Total alkalinity	Chlorine disinfected pool	80 – 200 mg/L
Cyanuric acid	Outdoor pool only	Max. 50 mg/L, ideally < 30 mg/L
Ozone***	Any pool	Not detectable
Temperature	Any pool	Max. 38°C

* mg/L is equivalent to parts per million or ppm.

** Free chlorine concentration should be increased when high bather numbers are anticipated to ensure concentrations are never less than the minimum.

***Residual excess ozone is to be quenched before circulated water is returned to the pool.

Table 2 - Bromine disinfected pools

Parameter	Situation	Criteria*
Bromine**	Indoor swimming pool	Min. 4.5 mg/L
	Outdoor public pool	Min 2.25 mg/L
	Spa pool	Min. 4.5 mg/L
pH	Bromine disinfected pool	7.0 – 8.0
Bromide	Bromide bank system	Max. 9.0 mg/L
Total alkalinity	Bromine disinfected pool	80-200 mg/L
Ozone***	Bromine disinfected pool	Not detectable
Temperature	Any pool	Max. 38°C

* mg/L is equivalent to parts per million or ppm.

** Bromine concentration should be increased when high bather numbers are anticipated to ensure concentrations are never less than the minimum.

*** Residual excess ozone is to be quenched before circulated water is returned to the pool.

Chlorine and bromine disinfected pools with ORP systems

- In chlorine disinfected pool in which an ORP system is used, the oxidation reduction potential of the water must be at least 720 mV.
- In bromine disinfected pool in which an ORP system is used, the oxidation reduction potential of the water must be at least 700 mV.

Levels of pH

The pH level of the water must be:

- in the case of a chlorine disinfected pool—between 7.0 and 7.8, and
- in the case of bromine disinfected pool—between 7.0 and 8.0.

Alkalinity

- The alkalinity of the water must be between 80 mg/L and 200 mg/L.
- The alkalinity of the water must be tested once a day.
- However, if liquid chlorine (sodium hypochlorite) is used as a disinfectant in the pool or a carbon dioxide-based pH control is used, the alkalinity must be tested once a month only.

Ozone

- Ozone may be used in the circulation system of a pool but must not be present in the pool.
- If ozone is used in the circulation system of the pool, the pool must be tested once a week for the presence of ozone.

Cyanuric acid - outdoor chlorine disinfected pools

- Cyanuric acid may only be used in an outdoor chlorine disinfected pool and must not be used in a spa pool.
- If cyanuric acid is used, the concentration of cyanuric acid in the water must be tested once a week and must not exceed 50 mg/L.

Testing of disinfectants and pH levels

Parameter	Frequency of Monitoring
Disinfectant: Free chlorine, combined chlorine and total chlorine; or bromine	<p>For facilities with a continuous metered dosing system:</p> <ul style="list-style-type: none">tested manually before the pool opens for use <p>For facilities with an automated dosing system:</p> <ul style="list-style-type: none">tested immediately before the pool opens for the daytested during pool usetested manually once each day <p>For all facilities:</p> <ul style="list-style-type: none">additional testing should be undertaken when necessary taking into account the number of people swimming in the pool at a particular time, the hours of operation of the pool, the depth of the pool and the effect of sunlight on disinfectant levels
pH	Tested at the same time as for disinfectant parameters (all facilities)
Alkalinity	Daily for all facilities unless liquid chlorine (sodium hypochlorite) and/or carbon dioxide-based pH control disinfectant is used then monthly
Cyanuric acid	Weekly (outdoor chlorine disinfected pools)
Ozone	Weekly (if used in the circulatory system of the pool)

Records

A record must be made, and kept for at least 6 months, of the results of any testing required.

Table 3 – Verification Monitoring (microbiological)

Pool type	Heterotrophic Plate Count	E.coli	Pseudomonas aeruginosa
Category 1 Spas; hydrotherapy pools; pools used by swim schools; pools used by incontinent people; infant wading pools; highest risk pools	Monthly	Monthly	Monthly
Category 2 Swimming pools > 26°C (except Category 1 pools); wave, river and low depth (< 1 m) leisure pools; higher risk pools	Bi-monthly	Bi-monthly	Bi-monthly
Category 3 Swimming pools < 26°C (except Category 1 and 2 pools); diving pools; low and infrequent bathing load pools	Quarterly	Quarterly	When need arises
Maximum count allowable	<100 cfu/mL	<1 cfu/100 mL	<1 cfu/100 mL



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