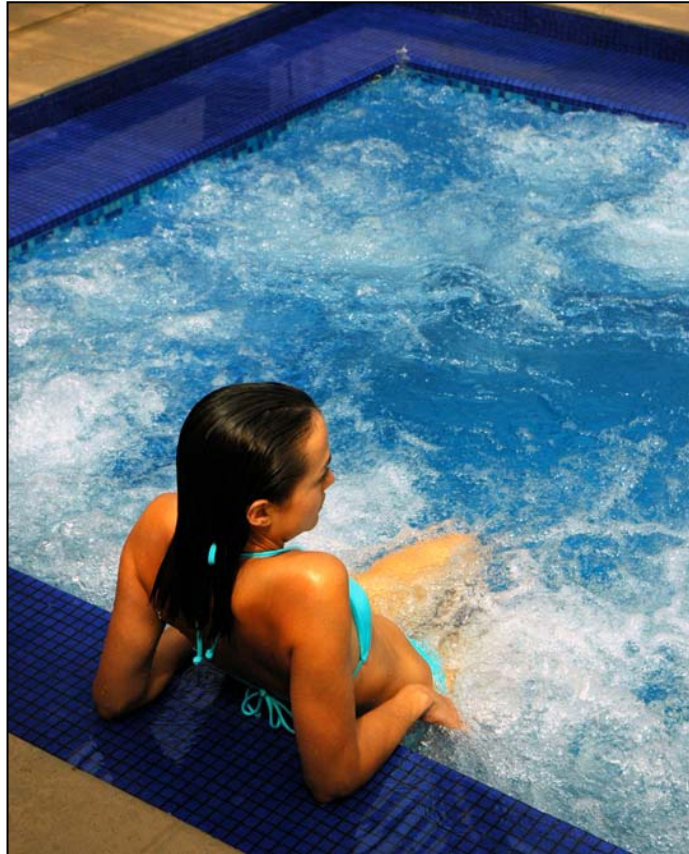


PUBLIC SPA MANUAL FOR OPERATORS



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Introduction

Public spas have been implicated in fatal or near fatal injuries and waterborne illnesses such as Legionnaire disease and Pseudomonas aeruginosa skin infection. The safe operation of a public spa can be challenging because of low water volumes, high water temperatures and heavy bather loads.

The purpose of this guide is to help owners and operators comply with the requirements set out in Ontario Regulation 428/05 (Public Spas) under the Health Protection and Promotion Act, RSO 1990 and to help operators understand their role in preventing injury and disease. Compliance with this guide does not exempt operators from their regulatory responsibilities.

Ontario Regulation 428/05 Public Spas can be found on line at <http://www.e-laws.gov.on.ca>. Our website www.timiskaminghu.com also has links to this site, and has forms and posters that you can download.

Please note that changes or alterations to your spa or operational equipment may require a permit from your municipal building department. Call your building inspector before you make changes.

If you need technical advice on the operation and maintenance of your spa please consult a spa contractor.

Role of Public Health Inspector

Improperly maintained pools and spas can allow the spread of disease-causing organisms among users. The goal of the public health inspector is to reduce or eliminate the incidence of these illnesses. Compliance with the regulation and good practice is a major tool in helping reach this goal.

Public health inspectors visit these facilities at least once per year during operation with additional inspections as needed. Your inspector can help you operate and maintain your spa in a safe and sanitary manner.

The Health Protection and Promotion Act provides the authority under which enforcement measures can be taken if conditions are found that are or may be hazardous to users. Enforcement measures may include closure of the spa until hazards are eliminated.

Role of the Operator

Owners and operators are legally responsible for ensuring that spas are operated and maintained in accordance with provincial requirements. Not doing so exposes bathers to unnecessary risk of waterborne illness or life threatening injury.

Operators can consult with their inspector at any time. Spa operators may close a spa whenever hazardous conditions are found and need not wait for an inspector.

Public Health Concerns

Public spas can be vectors for spread of infection. Poor spa operation and maintenance, as well as inappropriate use by bathers can result in disease transmission.

Spas have a small volume of water along with a high temperature that can cause disinfectant to evaporate rapidly. Disinfectant levels in spas need to be checked and adjusted every hour because once the disinfectant is gone, the health problems can begin.

Adequate disinfectant levels are essential to user safety but so is personal behaviour. Spa water contains dirt, human body oils, and micro-organisms and in the absence of enough disinfectant, can support the survival of disease organisms. Bathers may dip their head under the surface of spa water or may swallow the water or enter the spa when ill with diarrhea.

Skin Infections

Skin infections are normally not transmitted if correct disinfectant levels are maintained at all times in spa water.

Dermatitis from *Pseudomonas* is a common infection spread through spas if disinfectant levels are not maintained.

Pseudomonas is a bacterium that prefers to live in the slimy biofilm. It grows and multiplies between 4 C and 45 C and at pH between 4.5 and 8.5. Spa water is an ideal home for these bacteria. Infection occurs when hot spa water causes the skin pores to dilate. Bacteria enter the skin, then reproduce and excrete a toxin which causes an allergic reaction. Rashes develop 2 to 14 days after exposure and the rash may last about 8 days. Eventually our bodies recover as the immune system eliminates the bacteria and the skin heals.

The good news is that this bacterium is readily killed by disinfectants, so *Pseudomonas* is a problem only when an operator fails to maintain sufficient disinfectant residual in the spa.

Respiratory Illnesses

Colds, sinusitis, septic sore throat and Legionellosis are diseases that can lead to respiratory infections. Legionellosis is the most serious of these and will be discussed briefly here.

Legionella pneumophila is a bacterium that is widespread in the natural and man-made water environment and outbreaks have occurred worldwide. The bacterium grows at warm temperatures (32 C - 41 C) and becomes established in biofilm like Pseudomonas does.

Legionella can survive in spa water that has less than 1 ppm free available chlorine (FAC). It will migrate into the spa water and when the spa jets generate bubbles containing the bacteria, the bubbles burst into the breathing area of users and the bacterium is inhaled into the lungs. The disease can be severe or even fatal. Most at risk are people who have weak or diseased lungs, especially smokers.

There has never been a documented outbreak of Legionellosis in spas when disinfectant levels were correctly maintained.

Enteric Communicable Diseases

Giardia, Cryptosporidium, E.coli and Shigella are some of the more common organisms that can cause serious recreational waterborne illnesses if people swallow water from an untreated spa that has been contaminated with fecal matter.

Diarrhea can be caused by many bacteria. It can last from a few days to weeks. Knowing this, we should make every effort to educate users not to enter a spa if they have experienced episodes of diarrhea within the last two weeks.

Users should always shower before entering a spa. This can remove bacteria and parasites on the body before they end up in the spa water.

Diarrheal diseases such as E.coli infection, Shigellosis and Norovirus infection can be controlled easily by proper disinfectant levels.

The chart below shows the time needed to kill some common organisms at three different concentrations of (FAC).

Organism	at 1ppm FAC	at 3ppm FAC	at 20ppm FAC
<i>E. coli</i>	1 min	.03 min	.05 min
<i>Hepatitis A</i>	16 min	5 min	0.8 min
<i>Giardia</i>	45 min	15 min	2.2 min
<i>Cryptosporidium</i>	6.7 days	53 hours	8 hours

Cryptosporidium is a parasite highly resistant to chlorine and can survive a normal spa environment for a long time.

This parasite can cause dehydration and severe illness requiring medical care. An infected person can continue to excrete cysts for several weeks after symptoms have resolved. The cysts can survive outside the body and can remain infective for two to six months in a moist environment.

A very important message to users would be to not swallow or spit the spa water. Often the public believes this water to be as safe as drinking from the tap.

Preventative Measures to Control Infectious Organisms

- Maintain adequate disinfectant levels even when the spa is not in use
- Treat the water immediately after refilling the spa
- Maintain pH in the proper range
- Test chemistry, replace water as needed and keep the filter clean

Fecal Accident Response

A diarrheal accident is a higher risk event than a formed stool accident. Diarrhea can contain hundreds of millions of infectious bacteria that quickly spread throughout the spa in a single fecal accident. Other users then acquire infection through ingestion of the water or just by contact, particularly with eyes, ears or other mucous membranes.

It is important to stress to users that they are not to enter the spa if they are ill with diarrhea. Staff should ensure that users shower prior to entering the spa.

NOTE:

Do not use spa if you have diarrhea now or had diarrhea in the last 14 days.

Formed Stool or Vomitus

- Evacuate bathers and close the spa
- Shut off recirculation system and chemical feed system
- Remove waste with a scoop and discard into a toilet
- Clean and sanitize scoop with 50 ppm bleach solution
- Bring disinfectant residual in spa water to 10 mg/L
- Restart recirculation and chemical feed systems and run for 15 minutes
- Adjust disinfectant residual so it is between 5 and 10 mg/L
- Check all operational requirements and adjust where necessary
- Reopen spa
- Document incident on Spa Maintenance Record.

Diarrhea

- Evacuate bathers and close the spa
- Shut off recirculation system and chemical feed system
- Remove as much of waste as possible
- Backwash filters
- Drain the spa
- Steam clean spa and deck surfaces or sanitize with 500 mg/L FAC solution
- Refill and circulate spa with 50 mg/L FAC for 3.5 hrs (see chart for Cryptosporidium kill times.)
- Reopen spa when all pool chemistry meets regulatory requirements
- Document incident on Spa Maintenance Record.

Water Contamination

Blood

Coming in contact with blood in spa water is unlikely to spread illness. Bacteria and viruses found in blood, including HIV, do not survive long in a properly chlorinated spa. Patrons do not, however, always clearly understand the risk involved and operators are encouraged to close the spa for a short period of time to retest chemical disinfectant levels and to allay patrons' concerns.

Vomit

Vomiting is common when swimmers ingest too much water. Although people don't swim in a spa, vomiting can be a symptom of another illness or of prolonged exposure to heat.

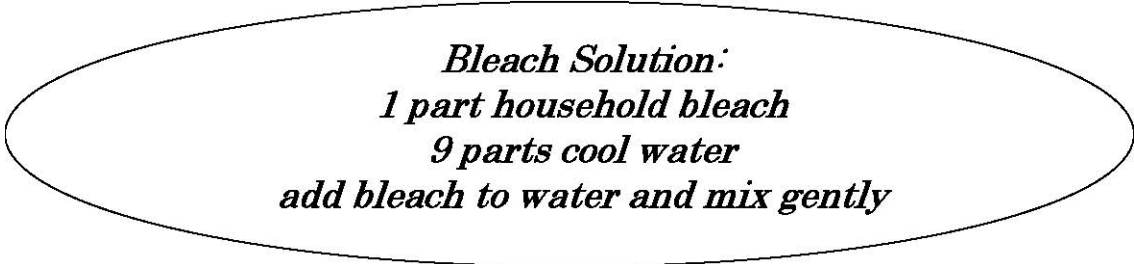
Public health risks associated with vomitus are usually from Norovirus as this virus family is both resistant to chlorine and highly contagious.

As a guideline, if the full stomach contents are vomited into a spa we recommend you follow the procedure for formed stool or vomitus.

Body Fluid Spills on Spa or Deck Surfaces.

Body fluids including blood, feces and vomit are all considered potentially contaminated with harmful bacteria. Spills of these fluids on the spa deck or in change rooms or bathrooms should be cleaned up and the contaminated surfaces disinfected immediately. Regular sanitizing of change room floors and showers will also control the fungus responsible for athlete's foot.

Clean Up Using Bleach Solution



***Bleach Solution:
1 part household bleach
9 parts cool water
add bleach to water and mix gently***

- Close access to area until cleanup and disinfection is completed.
- Wear disposable gloves.
- Wipe spills using paper towels or other absorbent material and place in garbage bag.
- Gently pour bleach solution onto surface to be disinfected.
- Leave this solution in place for 20 minutes.
- Wipe up the remaining bleach solution.
- Mops, scrub brushes, etc., that are not disposable should be immersed in bleach solution and air dried.
- Remove gloves after disposing of garbage and wash hands with soap and water.

Safety Devices

The requirements set out in the Regulation around safety devices and equipment is intended to prevent injuries and conditions that may lead to accidents. For example, limiting temperature of the spa water to 40 C is important for preventing the body's core temperature from rising too high. When our body's core temperature rises, symptoms may include dizziness, drowsiness, increases in blood pressure and fainting.

Pregnant woman, children and people with medical conditions should not enter a spa without prior consultation with a physician.

The timing device requirement is also set to a 15 minute limit to avoid elevated core body temperatures because the bather may not notice the temperature rise while in the warm water. Long exposure to these temperatures may cause a bather to lose the ability to exit the spa or to lose consciousness with a risk of drowning.

Suction system controls such as a vacuum release system and a vacuum limit system are vital in preventing hair entrapment even evisceration. The importance of testing these devices cannot be overstated.

Time is critical when an emergency does occur in a spa, so a nearby operating telephone is essential.

The emergency stop button is required to quickly shut down pumps to prevent entrapment, and to sound the alarm for assistance if there is an emergency. These alarms and signals must be seen and heard by operators without delay so that prompt emergency action is taken. The location of these devices is to be assessed by each operator and relocated if necessary. It makes no sense and it may be dangerous to locate these devices where they are difficult to see or hear.

Proactive illness and injury prevention should be as high a priority as water chemistry. If you have any one of the following conditions present you have a problem with the spa:

- Slime
- Foam
- Odours
- Difficulty maintaining sanitizer levels
- Cloudy water
- Persistent user complaints

Safety Equipment

Emergency Stop Button	<ul style="list-style-type: none"> • Deactivates all spa pumps • Is separate from the spa's timing device • Activates both visible and audible alarms • The alarms must be placed in occupied areas where operators can respond immediately • Tested once a month and recorded
Emergency Telephone	<ul style="list-style-type: none"> • A land line • Within 30 metres of the public spa • Connects directly: a) to an emergency service orb) the local telephone utility • Tested each day before opening and recorded
First Aid Kit	See attached list
Ground Fault Detector	<ul style="list-style-type: none"> • Tested daily before opening and recorded
Upper Limit Cut-Off Switch	<ul style="list-style-type: none"> • Limits the maximum temperature of the spa water to 40 C • Independent of the spa's water temperature thermostat
Timing Device	<ul style="list-style-type: none"> • Controls the operation of the jet pump • Can be set to a maximum of 15 minutes • Requires a bather to exit the spa to reset it
Vacuum Relief Mechanism	<p>Must have one or more of the following:</p> <ul style="list-style-type: none"> • A vacuum release system • A vacuum limit system • Another engineered system designed, constructed and installed to conform to good engineering practice appropriate to the circumstances • Tested once a month and recorded
Clock	<ul style="list-style-type: none"> • Located so that it can be seen and read from within the spa
Steps (optional)	<ul style="list-style-type: none"> • Equipped with a handrail • Non-slip surface • A band of contrasting colour on side and top edges

Other Emergency Equipment

If the spa has a diameter or width of more than 3 metres the operator must also provide:

Reaching Pole	• 3.65 metres long, electrically insulated • Available on deck
Buoyant Throwing Aid	• Rope to be 6 millimetres in diameter • Rope length to be 3 metres + half the width of the spa • Available on deck
Spine Board	• To be in good condition • Available on deck

• Deck Markings “DEEP AREA” and “SHALLOW AREA” at their respective locations in figures at least 10 cm high

Required Signs

1. **Timing Device**

The timing device must be identified with letters 25 millimeters or higher that states:
TIMING DEVICE

2. **Emergency Telephone**

A sign (letters 25 millimeters or higher) must be posted near the entrance to the public spa that gives the location of the emergency phone.

The following information must be posted at the emergency phone:

EMERGENCY TELEPHONE
DIAL 911 for emergency resuscitation, medical and fire services
Name of the Spa: _____
Address of Spa: _____
Location of Spa: _____
In House Emergency Number: _____

3. **Emergency Stop**

The following sign (letters 25 millimeters or higher) must be posted above the emergency stop button:

**IN THE EVENT OF AN EMERGENCY PUSH
EMERGENCY STOP BUTTON AND USE EMERGENCY PHONE.
AN AUDIBLE AND VISIBLE SIGNAL WILL ACTIVATE.**

4. Caution Sign

The following notice must be posted at each entrance to the spa with the word CAUTION in letters not less than 50 millimetres high and all other lettering not less than 10 millimetres high:

CAUTION

Children under the age of 12 are not allowed in the spa unless supervised by a person who is 16 years of age or older.

Pregnant women and persons with known health or medical conditions should consult with a physician before using a spa.

Do not use the spa if you have an open sore or rash, or are experiencing nausea, vomiting or diarrhea.

Overexposure may cause fainting. 10 to 15 minutes may be excessive for some individuals. Cool down periodically and leave the spa if nausea or dizziness occurs.

Enter and exit the spa slowly, to prevent slipping.

Do not play or swim near drains or suction devices. Your body, body parts, hair, jewelry and other objects may become trapped and cause injury or drowning. People with long hair should be especially careful.

Do not enter or remain in a spa if a drain cover or suction fitting is loose, broken or missing. Immediately notify the spa operator.

No food or beverage except water is permitted within the deck or spa. No glass containers of any kind are permitted within the deck or spa.

Maximum bather load of spa is _____.

5. Shower Sign

The following notice (letters 25 millimeters or higher) is to be posted at every entrance to the spa deck:

NOTICE

Every bather shall take a shower, using warm water and soap and thoroughly rinse off all soap before entering the deck.

Important Math Calculations

Maximum Bather Load The maximum bather load is the lower number of:

- a) bather load identified by manufacturer of spa or,
- b) one person per square metre of surface water.

Calculating Bather Load:

Determine the shape of the spa

a) **Square or rectangular:**

Length of spa = _____ metres

Width of spa = _____ metres

Length _____ metres \times Width _____ metres

= _____ square metres

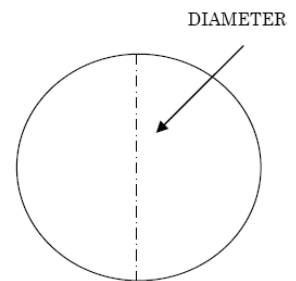
b) **Circle:**

Diameter of spa = _____ metres

Diameter _____ metres \div 2 = Radius _____ metres

3.14 (pi) \times Radius _____ metres \times Radius _____ metres

= _____ square metres



For example, if there are 7.4 square metres of water surface, the permitted bather load would be 7.

Turnover Period

Turnover period is the time required for the total volume of water to be filtered, disinfected and returned to the spa once. The spa volume must be turned over several times each day for a spa to operate safely.

1) Determine the volume.

a) If Square / rectangular:

Length = _____ metres

Width = _____ metres

Depth = _____ metres

Length \times Width \times Depth = Volume of spa

= _____ metres \times _____ metres \times _____ metres = _____ cubic metres (m³)

b) If Circular:

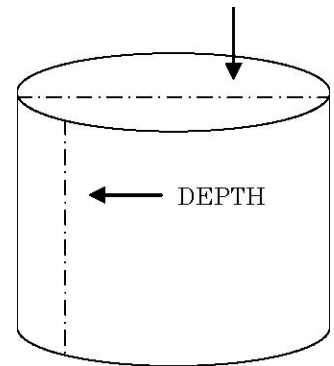
Diameter = _____ metres Radius (½ diameter)

= _____ metres

3.14 \times radius \times radius \times depth = Volume of spa

3.14 \times _____ metres \times _____ metres \times _____ metres

= _____ m³



2) Determine what the flow meter reading must be.

When the volume (as calculated above)

a) Is more than 6m³

Flow meter reading

$$= \frac{\text{volume in m}^3 \times 1000 \text{ litres/m}^3}{30 \text{ minutes}}$$

$$= \frac{\text{m}^3 \times 1000 \text{ litres/m}^3}{30}$$

$$= \text{_____ litres/minute (L/m or Lpm)}$$

OR

b) Is between 4m³ and 6m³

$$\begin{aligned}\text{Flow meter reading} &= \frac{\text{volume in m}^3 \times 1000 \text{ litres/m}^3}{20 \text{ minutes}} \\ &= \frac{\text{m}^3 \times 1000 \text{ litres/m}^3}{20} \\ &= \text{_____ litres/minute (L/m or Lpm)}\end{aligned}$$

OR

c) Is less than 4m³

$$\begin{aligned}\text{Flow meter reading} &= \frac{\text{volume in m}^3 \times 1000 \text{ litres/m}^3}{15 \text{ minutes}} \\ &= \frac{\text{m}^3 \times 1000 \text{ litres/m}^3}{15} \\ &= \text{_____ litres/minute (L/m or Lpm)}\end{aligned}$$

The flow meter reading is measured by a flow meter. The reading calculated above must match the actual reading on the spa's flow meter. This ensures that the turnover period is achieved.

For example, if the calculated flow meter reading is 105 l/m then the flow meter must read at least 105 l/m.

Make-Up Water

The Regulation requires that water be added to a spa each day to make-up for the water lost to bather activity and to evaporation.

If the volume of the public spa is 4,000 litres of water or more

- add at least 30 litres of make-up water for each bather each day
- add no more than 20% of the total spa volume each day
- a meter that measures make-up water volume is required

Calculate the spa Water Replacement Interval (WRI)

If the volume of the public spa is 4,000 litres of water or more

$$\text{WRI} = \frac{\text{Volume of spa in litres}}{10 \times \text{Number of Uses}^*} = \text{number days between total}$$

** if one person used a public spa three times in a day, the number of uses would be 3.*

Example:

If the spa volume = 5000 litres
and the estimated number of uses each day = 60
then $\frac{5000}{10 \times 60} = \frac{5000}{600} = 8.34$ (then round up to whole #)
therefore the tub must be drained every 9 days.

Operational Records and Inspection

Spa operators are required to conduct routine checks of equipment and chemicals at a prescribed frequency and to document these checks. These documents make up the operational record, are important to overall maintenance plans and may be supportive documents for the facility in the event of an accident or injury that results in legal action.

It isn't enough to just record chemistry test readings or equipment breakdown if nothing is done in response. The operator must have training and have written procedures in place to deal with emergencies as well as routine matters.

This binder cannot take the place of good written procedures and protocols specific to your spa.

Remember to:

- Record all inspections and tests on a daily log.
- Sign the records.
- Keep your records for a minimum of one year and have them available for review by a public health inspector.

Tests and Inspections

When	Tests and Inspections	Requirement
Daily: ½ hour before opening and every hour while open	Free Available Chlorine (FAC) OR total bromine	5 - 10 mg/L
	Total Alkalinity	80 mg/L minimum
	pH	7.2 - 7.8
	Water Temperature	Not to exceed 40 C
	Clarity	Must be able to see the lowest water outlet drain
Daily: ½ hour before opening and once more during the day	Oxidation Reduction Potential (ORP) sensor reading (if used)	700 mV minimum
Daily: ½ hour before opening	Ground Fault Detector	Also when test is conducted
	Emergency Telephone	Also when test is conducted
Daily before closing	Make-Up Water (when applicable)	Record make-up water meter reading
Each day	Number of uses	Estimate for the day
	Safety equipment including first aid box	Must contain required supplies
As they occur	Chemicals added	Record details including the time
	When spa drained, inspected and refilled	
	Equipment breakdowns	
	Emergencies and rescues	Record details in logbook
Weekly	Cyanuric Acid	Maximum 150 mg/L
Each Month	Suction Outlets (Drain covers/skimmer lids)	Must be secure and operational
	Vacuum Release Mechanism	Must be operational
	Emergency Stop Button	Must be operational

Water Treatment (Water Balance)

In order for the sanitizer (chlorine or bromine) to efficiently destroy harmful organisms, the spa water must be in proper balance. Proper balance means that the pH level, total alkalinity, calcium hardness, temperature and total dissolved solids must be kept at levels that ensure water is neither corrosive nor scale-forming. To ensure proper balance maintain the ranges outlined in Sections 6(1) to 6(4) of Regulation 428/05 as summarized below:

Water Treatment Sections 6 (1) – 6 (4)	
Total Alkalinity	Minimum 80 mg/l but not more than 180 mg/l ideal range 100 - 120mg/l
pH	7.2 – 7.8 deal range 7.4 – 7.6
Free Available Chlorine or Total Bromine	5 - 10 mg/l
(if provided) Oxidation Reduction Potential (ORP)	not less than 700mV
Cyanuric Acid Ideal range 30 – 50 mg/l Note: Cyanuric Stabilizer should be not added if the spa and its deck is totally or partially covered by a roof	Maximum of 150 mg/l
Clarity Ideal to have a cover or fitting in a contrasting colour to the spa surface	Lowest outlet drain is visible when the spa is in a non-turbulent state
Filtration System	In continuous operation except during maintenance or repairs



Toronto Public Health

Oxidation Reduction Potential (ORP)

An ORP reading on an automatic sensing device of a spa is an indicator of the sanitizer's (chlorine or bromine) ability to destroy harmful organisms such as bacteria and viruses. ORP is measured in millivolts (mV).

The ORP value is affected by both the pH (hydrogen ion concentration) and the amount of cyanuric acid in spa water. As the amount of cyanuric acid increases, the effectiveness of chlorine/bromine decreases resulting in a corresponding reduction in the ORP reading. Similarly, as pH increases there will be a corresponding reduction in the ORP reading. However, as pH decreases the production of hypochlorous acid increases which increases the ORP reading.

The accuracy of an ORP reading is also dependent upon proper installation and maintenance of measuring equipment. The electrodes (probes) that measure ORP are designed to operate with a set volume of water flowing past them. Probes must be kept clean and free of any deposits to give accurate ORP readings. Further information on the proper maintenance of such equipment can be obtained from the manufacturer.

It is important to remember that ORP is a measure of the disinfectant capability of the water. FAC (chlorine) and total bromine readings measure quantity of disinfectant chemicals in the water. A substantial difference between the ORP reading and the manual chemical test likely means that the ORP device requires maintenance.

Close the spa when:

- Emergency stop button is not working
- Audible and visible alarm is absent or inoperative
- Vacuum release system is not working
- Emergency phone is not working
- Water heater upper-limit cut off switch is absent or inoperative
- Ground Fault Detector is not working
- Insufficient free available chlorine or bromine in the water
- Circulation/Filtration system is not working
- Spa is fouled
- Drain cover is missing or not secured

Chemical Safety

- Train staff on the importance of handling chemicals safely.
- Follow manufacturer's recommendations.
- Store spa chemicals in a cool, dry and well-ventilated space.
- Keep corrosive materials such as acids and combustibles (i.e., paper and rags) away from other chemicals.
- Keep all chemicals away from hot equipment and flame.
- Have personal protective gear available (gloves, respirators, apron, etc..)
- Material safety data sheets to be made available to employees for every chemical in use.
- Do not eat, drink or smoke in the chemical storage area.
- Ensure the chemical storage room is inaccessible to unauthorized persons.
- Handle chemicals with clean and dry scoops only. Each chemical should have its own scoop. Use scoops provided by the manufacturer.
- Keep containers closed when chemicals are not in use.
- Never re-use empty chlorine containers for storage of other chemicals and never mix contaminated chemicals with your fresh supply.
- When mixing chemicals, add them slowly.

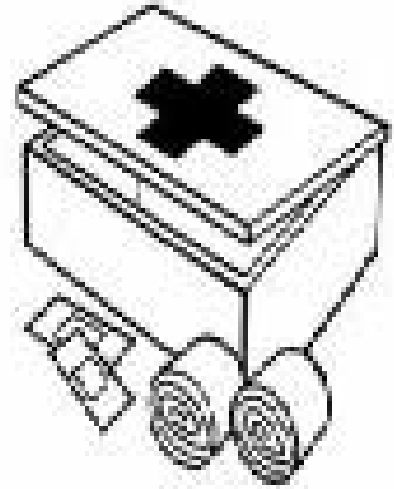
***NEVER ADD WATER TO THE CHEMICALS,
ALWAYS ADD THE CHEMICAL TO THE WATER.***

First Aid Kit Contents Checklist

- A current copy of the St. John Ambulance or Red Cross First Aid Manual
- 12 safety pins
- 24 adhesive dressings, individually wrapped

- 12 sterile gauze pads each 7.5 cm square
- 4 rolls of gauze bandages 5 cm in width
- 4 rolls of gauze bandages 10 cm in width
- 4 sterile surgical pads, individually wrapped

- 6 triangular bandages
- 2 rolls of splint padding
- 1 roll-up splint
- 1 pair of scissors
- 2 pairs of non-permeable gloves
- 1 resuscitation pocket ma



Spa Maintenance Record

Year: _____

Free Available Chlorine (FAC) (5-10 mg/L)	Bromine (5 - 10 mg/l)	pH (Levels - 7.2-7.8)	Total Alkalinity (Minimum 80mg/L)	Water Temperature (Maximum 40 C/104 F)	Water Clarity	ORP reading (700mV) 1/2 hour before opening, + once again during operating day	Ground Fault Detector (1/2 hour before opening)	Emergency telephone (1/2 hour before opening)	Makeup water reading (when applicable)	Estimated number of uses	First Aid kit / safety equipment	Cyanuric acid (less than 150 mg/L outdoor only)	Suction outlets	Vacuum Release Mechanism	Emergency stop button
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Day	Time	1/2 hour before opening, then every 1 hour	Daily						Weekly	Monthly		Name of operator			

Other (e.g. emergency rescue equipment failure; when spa drained, inspected and refilled) (Use back of form if necessary)
