

# Section 2: Pool Management



## 2.1 Management Structure

Owner, management and employee structure, individual titles, training and responsibility needs will vary from facility to facility. But, the underlying operational and management requirements are similar.

The owner of an aquatic facility is legally responsible for the operation, maintenance, and management of the facility including ensuring employees are appropriately trained and ensuring they practice on-the-job due diligence. Aquatic facility staffing may include an owner/board, pool/facility manager, qualified operator, responsible supervisor, instruction staff, lifeguard supervisor, lifeguard, assistant lifeguard and/or play feature attendant, mechanical engineer, cleaning/sanitation attendant, and clerical staff to name a few potential titles. It is up to each facility to design the employer, management and employee structure (see Section 2.2, Staff Qualifications, Training, and Expectations). The titles of all staff (including owners) and their responsibilities, roles, required training, certifications, and required recertification need to be clearly defined, recorded, audited yearly, and recorded in the Aquatic Safety Plan.

Design of the management and employee structure should also clearly define and designate person(s) in position of authority who will be available during all open hours and at a minimum have the authority to close the pool in the case of an emergency, potential emergency, and any other incident that could occur and affect the health and safety of patrons and/or staff. (See also Appendix 7, Criteria for Immediate Closure of the Pool and Section 2.2, Staff Qualifications, Training, and Expectations)

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## **2.2 Staff Qualifications, Training,<sup>29</sup> and Expectations**

### **Rationale:**

Operating a pool facility has become progressively more complex. Modern-day features including water slides, water rides, wave pools, and water spray play areas, and the advancements in pool equipment and treatment systems, and finally the emergence of chlorine-resistant pathogens, all add to this complexity. Further scientific evidence clearly shows that inadequately operated and designed pools do increase the probability of recreation waterborne illnesses<sup>30</sup>. Ensuring pool staff are educated and trained in the operation of the specific pool, and are available during operating hours, is essential in illness and injury prevention.

### **2.2.1 Pool operation**

The staff of an aquatic facility or venue should include a qualified pool operator and a responsible supervisor. The qualified pool operator (see below) may be off-site and available by contractual arrangement. The supervisor shall be available on-site as described below. During pool operating hours one of these staff members shall be on-site.

#### **2.2.1.1 Qualified operator**

A qualified operator is certified as a pool operator by an industry-recognized program and is responsible for control of the pool, spa, or recreational centre operations. Operators must have a sound and demonstrable knowledge of the pool(s) safety plans, operating procedures, and hazard prevention protocols that include

- Nova Scotia Operational Guidelines for Aquatic Facilities
- the aquatic facilities' Aquatic Safety Plan
- pool plant mechanics (or have on staff or contract a designated professionally trained person)
- pool maintenance
- water chemistry
- chemical safety
- pool disinfection/oxidation requirements
- water testing
- hazard reduction strategies
- first aid
- may include life-saving and resuscitation techniques (or have on staff designated professionally trained person or personnel)

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<sup>29</sup> Adapted with permission from the CDC Draft MOHC Operators Training Module, <http://www.cdc.gov/healthywater/swimming/pools/mahc/structure-content/index.html>

<sup>30</sup> Government of Alberta. (2006). Alberta Pool Standards. Retrieved June 2011, from Alberta Health and Wellness: <http://www.health.alberta.ca/documents/Standards-Pools.pdf>

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## **2.2.1.2 Responsible supervisor**

The Responsible Supervisor is an individual responsible for water treatment operations when the Qualified Operator is not on-site at the aquatic facility. This person shall

- have the authority to act in an emergency (or a person of authority is assigned this duty and is available)
- have the authority to close the venue when required (or a person of authority is assigned this duty and is available)
- be capable of testing the water quality levels as required and know how to make adjustments as needed to maintain water quality levels
- be knowledgeable regarding aquatic venue operation
- know how and when to contact the qualified operator

## **2.2.1.3 Contracted off-site qualified person**

The Contracted off-site qualified person may replace an on-site qualified person for less complex pools, but a Responsible Supervisor shall be always available when the pool is operating.

An aquatic facility may have a contracted off-site qualified person instead of, or as well as, an on-site qualified person. The off-site individual shall meet the same criteria as the on-site person. They would be expected to make routine visits, as outlined in the Aquatic Safety Plan, to the facility, be available for consultation, and provide a written report that would be available and retained on-site and provide supervision/technical direction and advice to the on-site Responsible Supervisor.

## **2.2.2 Staff training**

### **Rationale:**

Depending on the size, design, features, and intent of the aquatic facility, there may be one or many part-time and full-time staff members that play very specific and sometimes general roles in the functioning of the facility. Developing job descriptions for all staff that clearly outline expected duties and the required training and on-going training required to enable the staff member to perform his/her duties safely and effectively is an essential part of pool operation and shall be recorded in the Aquatic Safety Plan.

Training shall include, but not be limited to

- Training in water safety (e.g., swim to survive), emergency procedures, first aid and CPR for appropriate pool-related staff
  - Not all staff working in a pool environment will necessarily be proficient swimmers. Lifeguards, if available, will not always be available. Staff including maintenance and cleaning personnel may be at risk of water-related injuries. Formal training, practical simulations, and regular in-servicing on the Aquatic Safety Plan and how to respond to a drowning person in a safe manner, without endangering their own life or the lives of others, is recommended.
  - Staff shall not work alone

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- Orientation of all new staff shall include Aquatic Safety Plan training, orientation to the facility, and, when appropriate:
  - facility communication plan
  - facility fire safety plan
  - facility occupational and safety plan and procedures
  - cleaning and disinfection of surfaces procedures
  - injury prevention program (e.g., back care)
  - violence in the workplace
  - other facility-specific requirements
- Appropriate certification and training may also include pool operator training (see Section 2.2.1, Pool Operation)
- Lifeguard/lifesaving (see Section 8.2, Aquatic Facilities with Supervision and Lifeguards)
- Swimming and other class instruction
- Proper use of personal protective equipment
- Training in specialized first aid equipment use
- WHMIS (specialized)
- Maintenance and electrical training
- Any other identified certification and training

## 2.3 Aquatic Safety Plan Development

### Rationale:

The intended purpose of an Aquatic Safety Plan is to protect the health of patrons and staff, and ensure the longevity of pool equipment. The goal is to develop pool-specific risk reduction/prevention policies and procedures, and describe actions to protect the health and safety of patrons and workers. Clear written operational procedures including preventative equipment/facility maintenance and cleaning, and procedures required to ensure consistent, efficient, and effective response to emergency situations that may occur are essential in the Aquatic Safety Plan. All staff shall receive continual training in the Aquatic Safety Plan.

### Who should develop the Aquatic Safety Plan?

A designated team shall develop a comprehensive Aquatic Safety Plan document that is customized to the facility. Appendix 1 provides an example Table of Contents for an Aquatic Safety Plan and a Nova Scotia Aquatic Safety Plan template will be available. The designated team should include persons with aquatic venue risk assessment expertise, an experienced qualified pool operator, maintenance technicians, person(s)/organizations with lifeguard risk assessment expertise and any other essential pool staff.

**Note:** A poorly developed plan can lead to high-risk situations for both patrons and employees. Investing in the development of a quality Aquatic Safety Plan is worthwhile and wise. Seeking the expertise of lifeguard facility planning and aquatic risk assessment specialists is recommended when developing or updating pool-specific policies and procedures. (See also Section 1.3, Hazard Mitigation - And Aquatic Safety Plans).

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Other requirements include:

- All staff are required to receive formal training, participate in practical simulations, and sign-off on all facility procedures and training outlined in the Aquatic Safety Plan that is specific to them and general to all employees.
- The plan is to be reviewed and updated by the designated team as appropriate, or at least annually.
- Any additional required plans, such as the Fire Safety Plan, Occupational Health and Safety Plan, and Violence Prevention Plan can be incorporated into the Aquatic Safety Plan or maintained as separate documents.
- Plan components shall include:
  - venue description
  - job titles, descriptions, and expectations (Position Chart)
  - risk assessment – hazard identification
  - standard operating procedures for all aspects of the pool operation
  - preventative maintenance and cleaning plans of the pool including the nature and frequency of the cleaning and maintenance
  - staff training qualifications and certificates
  - procedures to be followed in the event of a serious injury, emergency, or incident (emergency response plan)
  - the type of lifesaving and first-aid equipment to be kept within the immediate vicinity of the pool(s)
  - the number of lifeguards (and assistant lifeguards) equipment and operations staff that are to be on duty while the pool is in use and, as required, specific to type of activity and pool features in use. See the recommended Table of Contents in Appendix 1, Aquatic Safety Plan Table of Contents.

## **2.3.1 Standard Operating Procedures**

### **Rationale:**

Qualified operators, maintenance technicians, cleaning staff, instructors, lifeguards, and other essential staff shall be provided and trained in correct operating procedures to ensure the health and safety of pool patrons as well as staff.

### **Recommendations:**

This part of the plan shall identify and describe the procedures to be followed for all aspects of venue operation, which may include

- pool operator, responsible supervisor, maintenance qualifications, and other staff training
- worker safety (including safety for non-swimmers working in an aquatic environment)
- emergency response procedures (see also Section 2.3.5, Emergency Response and Communication Plan)
- communication plan
- proper testing of pool water chemistry
- proper adjustment of pool water chemistry
- proper backwashing of filters
- proper cleaning of hair and lint strainers
- proper priming of pumps

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- filter care and maintenance
- proper application of diatomaceous earth to filters (where used)
- proper handling and storage of chemicals and equipment
- ensuring lockdown (see below) procedures are in place so no one is injured during maintenance
- ensuring written operating, maintenance, and inspection standards for all equipment including play equipment are in place (see Section 2.3.2, Preventative Maintenance)
- cleaning procedures (see Section 2.3.3, Cleaning Plan and Schedule)
- patron education and warning signs (see also Section 2.3.7, Patron Education)

This list is not exhaustive. More complex pool facilities will require more complex procedures. Where possible, pools shall keep a copy of engineering plans and/or pool drawings on-site to assist with trouble-shooting of problems.

A clear distinction shall be made between the work done by lifeguards, maintenance staff, and custodians. It shall be clear who is responsible for which tasks.

## **2.3.2 Preventative Maintenance**<sup>31,32</sup>

### **Rationale:**

The goal of a Preventative Maintenance Plan is to help prevent costly repairs and breakdowns, and to prevent both recreational waterborne disease outbreaks and physical injuries due to faulty and poorly maintained equipment. Operators shall ensure that pools and pool equipment are kept in good repair so that no health hazards exist.

### **Preventative Maintenance Recommendations**

As part of the Aquatic Safety Plan, a written Preventative Maintenance Plan shall be included. Staff shall be trained in the implementation of this plan. The plan shall contain

- a list of equipment needed and operational procedures the staff shall follow
- necessary equipment information:
  - an inventory of all equipment used in the pool operation
  - manufacturer's and pool designer's manuals, and recommendations for all equipment, which shall include equipment name, model number, any specs, operations manuals warranty, contact information for local vendors/supplier and technical representative
- schedule for routine preventative maintenance, and safety inspection
- daily (pre-opening), seasonal or periodic maintenance, servicing, and component replacement shall be developed based on the above information, equipment use, and any other pool-specific information including
  - assurance that nothing in the pool presents a tripping hazard to bathers, such as stairs or other physical structures in the pool water
  - assurance that all areas of the pool are sufficiently lit so that all areas are visible
  - scheduled regular testing of the function of equipment to ensure it is safe for use, and maintained in accordance with manufacturer's recommendations

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<sup>31</sup> The USA Centre for Disease and Prevention. (2014) Model Aquatic Health Code—First Edition The Code

<sup>32</sup> The USA Centre for Disease and Prevention. (2014) Model Aquatic Health Code—First Edition The Code

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- regular testing and maintenance of the surfaces of walkways, stairs, decks, and platforms to ensure they have not become a slip hazard as a result of becoming smooth and/or worn
- prevention of the formation of ice on walkways, steps and ladders of outdoor pools that are operated in the winter
- assurance that all handrails are securely attached
- assurance that all pool features including slides, diving boards, and Tarzan ropes are maintained to prevent injuries
- verification that the temperature of hot water outlets (including showers) is below 49°C to avoid scald injuries
- assurance that recirculation system, including disinfection equipment and filters, is functioning properly
- assurance that water depth is clearly marked in metric units of measurement
- assurance of safe storage of chemicals
- assurance that the facility is free from sharp or blunt objects that are likely to cause injury
- assurance that the facility is not deteriorating to allow bacterial or algae growth, biofilm development, or to cause injury
- regular testing of ground fault interrupters for underwater lights to prevent electrical shock (See Aquatic Safety Plan Template)

### **2.3.3 Cleaning Plan and Schedule**

#### **Rationale:**

Developing a cleaning plan is a proactive measure that helps encourage sanitary conditions and an inviting venue for patrons, and also increases the longevity of equipment and ensures employee and patron safety.

#### **Biofilm**

A biofilm is a slime layer that develops as a result of bacteria excreting a slimy, sticky substance following their adherence to a surface. This substance acts as a barrier. Many bacteria naturally form biofilms. In nature, biofilms can contain many different species of bacteria, and may include disease-causing bacteria. Biofilms can be very difficult to remove and can confer resistance to chlorine; in fact, biofilms can be a source of chlorine consumption in the pool. Biofilms form on damp, moist, and wet surfaces, which need to be cleaned regularly. They are typical in pool water distribution systems, recirculation lines, filters, collector tanks, and swimming pools. Effective cleaning and operation of the pool and its equipment helps prevent excessive biofilm development. Removal of biofilms requires cleaning, disinfection, and scrubbing of the affected surface.

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## **Cleaning plan**

Operators shall identify appropriate cleaning schedules to ensure the health and safety of pool patrons and workers. This includes

- frequency of cleaning for each part of the pool, including pool toys
- chemicals and cleaners used, ensuring cleaner and disinfectant compatibility
- step-by-step procedures to be used to clean and disinfect, when necessary, including required disinfectant contact time and manufacturer's instructions
- any required training for cleaning staff
- any required personal protective equipment
- a lockdown procedure to ensure no one is injured during cleaning
- more complex procedures for more complex pools

## **A cleaning plan shall include and highlight the following:**

- periodic removal of hard water scaling and body grease
- scrubbing and cleaning of all accessible surfaces as necessary to minimize the formation of slime and biofilms
- detailed standard operating procedure for cleaning and disinfection, which will include, but not be limited to
  - pool walls, floor, and pool decks
  - washrooms, showers, and change rooms
  - steam rooms and saunas
  - pool equipment and toys, such as floaties and cleaning devices
  - pool covers (where applicable)
  - transfer channels

## **Choosing cleaning products**

Special consideration shall be given to choosing cleaning agents for in and around pools. Considerations include

- some cleaning products contain surfactants that affect the monitoring of chlorine residual and cause foaming or phosphates, which will promote algae growth
- some products may also contain oxidizing agents that cause a false reading on water test
- other compounds simply contain ammonia and could produce unhealthy pool conditions due to high chloramine levels
- cleaning products shall be kept out of the pool water and any transfer channel
- incompatibility between cleaning and pool chemicals must be avoided
- the pool area must not be cleaned when people are in the pool

## **Good cleaning practices include**

- being appropriately trained and using appropriate personal protective equipment and lock out procedures
- maintenance of surfaces to be cleaned to ensure they are smooth, non-absorbent, and easily cleanable

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- cleaning from the cleanest region to the dirtiest to reduce the risk of cross-contamination
- use of single-use cloths and cleaning equipment, such as mops and buckets, that are in good repair, replaced regularly, cleaned daily, and stored in a designated area after use in an inverted position or another orientation that promotes drying
- knowledge of detergents and disinfectants including compatibility with the surface being cleaned and disinfected, required disinfectant contact time, proper chemical handling, storage, and disposal
- availability and knowledge of all required material safety data sheets, manufacturer's instructions on equipment or surfaces being cleaned, manufacturer's instructions on cleaning and disinfectant agents, and any municipal, provincial, and federal by-laws and regulations

## **Cleaning frequency guidance**

- Toilets, showers, changing facilities, and pool surroundings shall be cleaned and disinfected (when appropriate) at least daily.
- Hot tubs/spas shall be drained and the surfaces and pipework cleaned on a weekly basis or as needed (see Section 5.2, Wading and Spa/Therapeutic/Hot Tub Pools).
- Heating, ventilation, and air-conditioning systems shall be cleaned periodically (e.g., facility dependent).
- Features like water sprays shall be periodically cleaned, scrubbed, and flushed with disinfectant (e.g., 5 mg/L hypochlorite solution) (see Section 5, Aquatic Play Features and Other Pool Types).
- Shared equipment may include, but not be limited to, towels, bathing suits, snorkels, nose clips, goggles, fins, kickboards, tubes, and noodles. Shared equipment
  - shall be maintained in good repair
  - shall be stored in non-absorbent, easily cleanable receptacles
  - may require additional cleaning and disinfection if a communicable disease outbreak has been identified, or if there was a contamination event like a pool fouling. (Please refer to the emergency procedure sections for additional information.)

## **Bathing Suits and Towels**

Bathing suits and towels should be washed with detergent and warm water, rinsed, and thoroughly dried at the warmest temperature in accordance with the fabric label after each use.

## **Equipment that comes in contact with eyes, nose, ears, and mouth (snorkels, nose clips, goggles)**

The equipment shall be cleaned (scrubbed), disinfected, dried, and stored in a manner to prevent biofilm formation and biological growth.

## **Fins, Kickboards, Tubes, and Noodles**

These shall be cleaned, scrubbed, and stored to prevent microbial growth.



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## 2.3.4 Chemical Handling and Storage<sup>33</sup>

### Rationale:

Chemicals commonly used in pools can be dangerous on their own, and if they are mixed with non-compatible chemicals or water the results can be dangerous and even deadly for workers, patrons, first responders, and those within the vicinity of the facility and storage area. Spills or leaks due to poor handling and storage technique or due to pipe or container corrosion can lead to chemicals reacting with other chemicals, which can lead to fire, smoke, poisonous gases, or other hazards.

Due to the nature and volume of pool chemicals that are used and may be stored at aquatic facilities, many aquatic facilities are required to have a Fire Safety Plan as noted in the National Fire Code. This is a document that should be developed with the municipal fire inspector and can be included as part of the Aquatic Safety Plan.

### Recommendations:

For each chemical, safe and appropriate handling, storage, and disposal step-by-step procedures shall be developed and documented as identified by material safety data sheets (MSDSs), manufacturer's instructions, and appropriate regulatory requirements (e.g., Nova Scotia Departments of Labour and Environment, Nova Scotia Fire Marshall's Office, Environment Canada, and any other agencies responsible for safe disposal and storage of other chemicals), and shall be reviewed for specific storage concerns and for incompatibility with other chemicals.

- A list shall be made of incompatible chemicals to provide clarity to staff and first responders.
- Concerning fire safety, a list of chemicals and where they are stored in the building shall be prepared and readily available to first responders in case of emergency.
- Every worker expected to handle chemicals shall be trained according to the requirements of WHMIS (Workplace Hazardous Material Information System) regulations. This includes generic education to enable workers to understand the information on labels and on MSDS, as well as workplace-specific training including how the product is used and stored safely, personal protection required, and what to do in an emergency. See also Aquatic Safety Plan Template.



<sup>33</sup>Based on consultation and conversation with Shelley Gray, Occupational Hygienist, NS Department of Labour and Advanced Education

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The following are general chemical safety handling and storage tips:<sup>34</sup>

- Never add water to chemicals. Always add chemicals to water.
- Never mix chemicals together prior to adding to pool water.
- Always wear the appropriate personal protective equipment for the job.
- When possible always keep chemicals in their original container. Where chemicals are required to be decanted, ensure the new container is properly and clearly labeled.
- Always clean up any spillage as outlined in the Aquatic Safety Plan and as indicated on the product label.
- Always keep storage area dry. Do not hose the area down.
- Prevent locating overhead lines carrying liquid or chemicals in the chemical storage area.
- Always keep chemicals away from electrical equipment and flames (chemicals shall not be stored in the furnace room).
- Chemicals shall be stored away from direct sunlight, temperature extremes, and high humidity.
- Always throw empty chemical bags or containers in specifically labeled containers; even small quantities can mix with other trash and ignite spontaneously.
- Never flush excessive chemicals into sewage that leads to a septic tank treatment system.
- Always store chemicals in a safe manner and location.
  - Chemical storage area(s) should always be secured from an unauthorized entry.
  - Doors should be locked and appropriate signage should be posted.
  - Ensure incompatible chemicals are stored on separate shelf units from each other.
  - Where storage space is very limited, separation may be achieved by storing incompatible products off the floor (such as on pallets) so that spilled material will not contaminate containers of other chemicals.
  - Similarly, incompatible chemicals should not be stored above one another to avoid contamination by spilling.
- Where disinfection systems other than gaseous chlorine are used (e.g., hypochlorite or bromine), the disinfection chemicals shall be kept separate from any acidic products.



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<sup>34</sup>National Swimming Pool Foundation, Pool & Spa Operator Handbook, 2012

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## 2.3.4.1 Gas chlorine and compressed air storage and handling<sup>35</sup>

### Rationale:

Ensuring proper storage and handling of Class 2 compressed gases shall be performed in a manner to prevent injury to workers and the public by preventing an explosion or gas leak.

### Recommendations:

**Storage:** Class 2 compressed gases are required to be stored in a specifically designed room as outlined by the National Fire Code. Room requirements include but are not limited to

- location on an exterior wall
- ventilation to the outside
- gas tight
- separated from flammable materials<sup>36</sup>

For additional information, consult with the chemical manufacturing company for guidance in safe delivery, handling, and storage. Other additional requirements will be cited on MSDS, within pertinent Nova Scotia Occupational Health Safety Regulations, and the National Fire Code.

## 2.3.5 Emergency Response and Communication Plan

### Rationale:

The Aquatic Safety Plan development is also intended to identify practices to reduce the risk of emergencies occurring and to develop written emergency response plans to respond to serious injuries, emergencies and other incidents.

### Recommendations:

The Emergency Response Plan shall include the following:

- written procedures for identification, efficient, consistent, and safe handling of emergencies
- identification of the equipment required to respond to all identified emergencies including personal protective equipment, and training of all staff in their use (occupational health and safety)
- identification of all appropriate signage required to assist in case of an emergency, which shall be posted in designated area (see Section 2.3.7 Patron Education, Signage and Appendix 8, Example: Pool and Spa Signage )
- training of staff in their specific role in the implementation of the plan
- training of all staff in the activation of the emergency plan
- a clear communication plan that facilitates activation of internal emergency response and/or contacting 911 as necessary
- provision and use of readily accessible and appropriate communication devices such as telephones, call boxes, walkie talkies, radio, and mobile devices
- procedures to be followed during staffed and unstaffed times
- acceptable alternative communication during loss of power
- training of all personnel

<sup>35</sup>B.C. Guidelines for Swimming Pool Operations V1.0 p. 29 retrieved from the www on October 7, 2013 at <http://www.health.gov.bc.ca/protect/pdf/bc-pool-operations-guidelines.pdf>

<sup>36</sup>In conversation with Fred Jeffers CFI-II CBO-II CFI NS Deputy Fire Marshal, Office of the Fire Marshal

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Table 4, (below) summarizes emergency situations that may be addressed in a facility's emergency.

**Table 4. Emergency Situations**

<b>Medical emergencies</b> <ul style="list-style-type: none"><li>• near-drowning or drowning</li><li>• unconscious/non-breathing/no pulse</li><li>• chest pain</li><li>• spinal and/or head injury</li><li>• broken bones and/or sprains</li><li>• seizures</li><li>• heat-related incidents</li><li>• major and minor first-aid</li><li>• allergic reactions</li></ul>	<b>Facility emergencies</b> <ul style="list-style-type: none"><li>• leakage of chlorine, ozone, natural gas, propane</li><li>• chemical spill</li><li>• fire</li><li>• power failure</li><li>• inclement weather</li></ul> (These may already be included in the facility's Fire Safety Plan)
<b>Health/hygiene emergencies</b> <ul style="list-style-type: none"><li>• fecal/vomit incidents</li><li>• disease outbreaks</li><li>• blood and bodily fluid exposure (in and out of water)</li></ul>	<b>Patron-related emergencies</b> <ul style="list-style-type: none"><li>• entrapped person</li><li>• hostile person</li><li>• missing person</li></ul> See also Section 7.3, Preventing Suction Hazards in Pools and Spas
<b>Natural disasters</b> <ul style="list-style-type: none"><li>• earthquake</li><li>• flood</li><li>• lightning</li></ul>	<b>Other</b> <ul style="list-style-type: none"><li>• ambulance access</li><li>• incident reporting</li><li>• media response</li><li>• incident stress debriefing</li></ul>

### 2.3.6 Records/Documentation<sup>37</sup>

#### Rationale:

Records serve many purposes including as a guidance tool for operators. They can provide insight in what works and what is not working and ultimately can save money. Operators shall ensure that daily records are kept for each pool and shall be available on-site for inspection on request.

#### Recommendations:

##### 1. Records shall include

- all injuries sustained at or within the pool
- all occurrences of fecal, vomit, and blood contamination at or within the pool
- amount and types of chemicals added to the pool water daily
- amount of daily water replacement
- frequency of testing (equipment and features)
- daily, weekly, monthly, and yearly routine results of pool water tests performed
- daily, weekly, monthly, and yearly facility preventative inspections (e.g., pool ladder integrity)

<sup>37</sup> Adapted with permission from the B.C. Guidelines for Swimming Pool Operations

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## 2. All records shall

- be accurate
- be clear and legible
- be in permanent ink
- indicate the date and time the test or corrective action was taken
- include the name of the individual making the entry
- be stored for 2 years and readily available on request

A sample pool and spa records sheet is found in Appendixes 4, 5 and 6, which may be copied and adapted.

See also Aquatic Safety Plan Template, Example: Incident Response Plan.

## Daily Records shall include

- disinfection levels such as free available chlorine (FAC), total chlorine (TC), combined chlorine (CC), bromine residual, pH
- daily attendance (total number of bathers)
- reading of make-up water
- any emergencies, rescues, or equipment breakdowns that occurred and the time of occurrence
- any required equipment inspections
- operating pressures of water recirculation pumps, filters and the corresponding rate of flow meter readings

## Weekly Records shall include

- cyanuric acid (if used) levels
- any weekly preventive maintenance

## Monthly Records shall include:

- results of inspections of all pool water outlet covers  
See also Appendix 3, Pool Parameters, Appendix 4, Example: Daily Pool Log and Appendix 5, Example: Spa Log

### 2.3.7 Patron Education

#### Rationale:

The role of pool patrons in preventing the spread of water-related illnesses and physical hazards cannot be understated. Ensuring a safe recreational water experience is a shared responsibility. A pre-swim cleansing shower, not swimming when ill, practicing good personal hygiene, and abiding by the rules of the facility including not swimming or diving beyond your ability are all major contributing factors to safe and fun recreational experiences.

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## Resource information:

Swimmer personal hygiene is a contributing factor to recreational water-related illnesses and the production of disinfection by-products in pools. Each of us has an average of 0.14 grams of fecal material that could rinse into the water if swimmers fail to take a pre-swim shower with soap. A single diarrheal contamination incident from a person infected with *Cryptosporidium* can introduce over 100 oocytes into the water, which, in a typically sized pool, is enough to cause infection if a mouthful of water is swallowed. Sweat, urine, make-up, skin, and hair all contribute to the production of disinfection by-products collectively termed chloramines, which can overload the disinfection process.<sup>38,39</sup>

## Recommendations:

### 1. Public Education

Each public pool and spa facility shall have a plan for public education that may include the following:

- Educate season pass holders: educating can create a sense of ownership of the facility, increasing patron participation in facility safety.
- Educate daily patrons.
  - One strategy is to hand out prevention messages to patrons as they enter the pool or park area.
  - Reinforce people's natural desire to care about their health. A suggested lead-in might be: "To ensure the health and safety of all our visitors, please remember to follow these easy steps for healthy swimming."
  - Consider implementing a short safety and recreational water illness orientation for larger groups before they enter the pool complex. This is especially important for groups with young children.

### 2. Develop policies

Implement bathroom break policies during instructional classes and encourage bathroom breaks during public swims.

### 3. Signage

Signage can be an effective tool to educate and warn patrons on venue rules and venue hazards. Signage shall state the rules of the pool be placed in a prominent location within the pool enclosure so that it is clearly visible to all pool patrons.



<sup>38</sup> Vore, Roy, PHD, National Swimming Pool Foundation, Recreational Water Illnesses, 2012

<sup>39</sup> 2013 World Aquatic Health Conference Seminars, International Conference on Swimming Pool & Spa, Rome 2013: Key Advances in Disinfection By-Products and Microbiology, Laura Suppes, R.S., M.P.H., University of Arizona

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Signage would include, but not be limited to, the following:

- diaper changing is prohibited pool side and diaper change station hygienic practice signage
- diaper-change station hygienic practices
- requirement of a pre-swim cleansing shower
- not to enter the pool enclosure with an illness including open sores, bandages, head colds, discharging ears or noses, or infected eyes
- not to swim if diarrhea has occurred in the past 14 days
- not to run, fight, or do anything else that could cause an injury while in the pool enclosure
- not to contaminate or foul the pool water
- to immediately report an injury suffered while in the pool enclosure, or any contamination or fouling of the pool, to the pool manager or lifeguard
- depth markers indicating water depths and changes in slope
- warning not to dive when the water is less than 2 metres (6.6 feet) deep (Note: the term “diving” is not intended to include swimming competitors or training for swimming competitions; in these cases, Federation Internationale de Natation rules are followed)
- ensuring thorough hand hygiene after bathroom breaks and before returning to the water
- safe use of hot tub
- rules for safe use of the swimming pool and swimming pool features
- location of the telephone for emergency use
- notification “for emergency dial 911”
- indication of “No Lifeguard On Duty” in those circumstances where lifeguards are not required (See Appendix 8, Example: Pool and Spa Signage)

## Use of pictograms

Universally accepted and recognized pictograms provide clear and identifiable messaging for all languages, ages, reading and comprehension ability. There are various universally accepted and identifiable pictograms available for pools including chemical hazard signs and lifeguard not on duty signs. Here are a few examples:

