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The Tidy Pool

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Water Clarity

One of the most important aspects of maintaining pool water is keeping it clear so that the pool bottom is clearly visible.

When the water is not clear it becomes difficult or even impossible to see if any swimmers are having trouble staying above water.

Proper supervision could be at the poolside and still not notice that a child is at the bottom of a pool if clarity is not good.

If the water clarity in your pool is not good enough where you can clearly see the pool bottom and the pools main drains, then you need to close your pool immediately until the water is clear enough to easily see the pool bottom and main drains.

Being able to see the main drains in your pool is not enough, the pool bottom must also be visible.

There have instances where a child has drowned in a pool where the main drain was visible but the child was still not able to be found because the pool bottom wasn't visible.

As a pool operator you should be visually checking the pool clarity several times a day, especially during times of heavy use.

Enclosed with this newsletter is a brochure on water clarity and a red and black disc that can be used to check pool clarity. Instructions for using the disc are located on the brochure that is included with the newsletter. If you have any questions on the proper use of the disk, please contact your pool inspector.

Could Your Pool Permit Be In Jeopardy?

The answer to this question depends on your facility. There is less than one year left to make upgrades to the main drain and/or fencing required by June 1, 2008. It is time to start preparing to make the corrections required if you haven't already done so. Required upgrades have been noted on multiple inspections and in letters from this office.

These upgrades are required to be reviewed by Washington State Department of Health prior to construction and sufficient time needs to be allowed for the review and the physical upgrades. We would suggest at a minimum that plans are submitted by the end of 2007. Do not wait until the last minute to make upgrades as improvements can take more time than you realize.

If final corrections to the facility are not made by June 1, 2008 the pool/spa permit will be suspended at that time and until the corrections are made to the main drain and/or fence.

The following is a review of the upgrades required for existing pools if not already complying.

Main Drains

Swimming pools with only a single main drain are required to install an emergency shut off switch for all pumps that control recirculation of the pool water. The shut off switch must be located within 20 feet of the pool and marked with an emergency shut off sign. The shutoff switch must include an audible alarm which can be heard by those in the area, or have an alarm that goes to a point where staff is always present during the periods the pool is open. Other options instead of the shutoff switch and alarm can be considered (i.e. installing a second main drain), please contact the health department if you are interested in pursuing this or another option to meet this requirement.

Barriers

All fencing must meet the new regulations by June 1, 2008 as well. These barrier requirements include:

- 5 foot minimum fence height for limited use pools (apartments, motels, condos)
- 6 foot minimum fence height for outdoor general use pools (schools, municipal, clubs)
- Solid barriers may not have indentations or protrusions
- Latches for limited use pools need to be at least 5 feet high or continuously locked and require a key or code to enter. Latches lower than 5 feet require an 18 inch radius of solid material around the latch. *Please note the 5 foot height requirement for latches may not be ADA (Americans with Disabilities Act) compliant.* Contact the local building department to discuss compliance with ADA.
- No openings in the barrier can allow passage of a 4-inch diameter sphere.
- Chain link mesh size shall not exceed 1 1/4 inches.
- Barriers that have horizontal members that are spaced less than 45 inches apart may not have spaces between vertical members greater than 1 3/4 inches
- Gates/doors must continue to be self-closing and self latching for limited use pools

Upcoming Certified Pool Operator Classes

Date	City	Contact #	Contact Name
November 1-2	Hillsboro	800-223-5450	Bill Whiteley
November 8-9	Bellevue	425-641-2995	Michael Dilley
March 13-14, 2008	Beaverton	360-241-7665	Phil Oaks
May 8-9, 2008	Tacoma	425-641-2995	Michael Dilley

See www.NSPF.com for more CPO Classes

Program Contact Info

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Improperly Balanced Pools Can Damage Your Pool Surface, Heaters and Other Pool Equipment: A Review of The Langlier Saturation Index (Proper Pool Balance)

The Langlier Saturation Index is a measure of proper chemical balance that determines how corrosive or scale forming the water in your pool is at that time.

Saturation Index = ph + TF + CF + AF – 12.1

A properly balanced pool should have an index value that is plus or minus .5 from a value of 0 when using the factor table and formula given. If the value you get when calculating your pools index is outside of +0.5 to –0.5 then adjustments to your pool chemistry should be made to protect the lifespan of your pool equipment.

It is a good idea to check your water balance at least weekly. The recommended ranges for water balance are below.

Also, it should be noted that when testing for your alkalinity with a pool test kit. The true value of the alkalinity is the total reading from the test minus 1/3 of the current cyanuric acid level in the pool/spa.

Recommended Ranges
pH = 7.2-80
Pool Calcium Hardness = 200-400 ppm
Spa Calcium Hardness = 150-250 ppm
Alkalinity = 80-120 ppm for plaster / 100-150 ppm for all others

Temperature °F	(TF)	Calcium Hardness ppm	(CF)	Alkalinity ppm	(AF)
32	0.0	5	0.3	5	0.7
37	0.1	25	1.0	25	1.4
46	0.2	50	1.3	50	1.7
53	0.3	75	1.5	75	1.9
60	0.4	100	1.6	100	2.0
66	0.5	150	1.8	150	2.2
76	0.6	200	1.9	200	2.3
84	0.7	300	2.1	300	2.5
94	0.8	400	2.2	400	2.6
105	0.9	800	2.5	800	2.9
128	1.0	1000	2.6	1000	3.0

Making Changes To Your Pool

This is a reminder that any changes made to the pool, pool deck, barrier, equipment or locker rooms require review and approval prior to changes being made.

This requirement is described in WAC 246-260-021 Water Recreation Facility Rules & Regulations. Any changes other than like for like (replacing a 3.14 sq. ft. sand filter for another 3.14 sq. ft. sand filter) or minor repairs during routine maintenance need to be reviewed to verify that the changes comply with health codes.

Changes to pools in Cowlitz County are reviewed by the Washington State Department of Health Water Recreation Facilities.

Gary Fraser is the contact at the Department of Health for pools and can be reached at 360-236-3073 to discuss requirements for plans reviews of potential changes to your Water Recreation Facility.

If you are unsure whether any planned changes require a formal review process, please contact Gary Fraser or call the Cowlitz County Health Department to discuss your proposed changes and whether they need a formal review or not.

Whether or not the changes require review, Cowlitz County Health Department needs to be notified to maintain proper records for your facility.

Use of Personal Footwear in Public Locker Rooms/Showers Recommended

Please consider advising your patrons to wear appropriate personal footwear in shared lockers/ showers.

Recently the Washington State Board of Health issued a recommendation that operators of water recreation facilities, schools, fitness clubs, hotels and other places with shared locker and/or shower facilities advise their patrons to wear appropriate personal footwear while in the locker/shower areas.

The purpose of the recommendation is to help prevent the transmission of foot infections, particularly plantar warts and fungal infections.

These infections can require protracted and often painful treatments. Also, the medications used to treat fungal infections of the nails can pose a risk of liver toxicity.

Website

The electronic version of the Guide for Developing A Pool Operators Manual is now available on our website.

www.co.cowlitz.wa.us/health

Once on the mainpage click on Environmental Health and then Recreational Water Safety to get to the swimming pool webpage.

Synopsis From CDC MMWR — Outbreak of Ocular and Respiratory Illness After Exposure to a Poorly Managed Indoor Motel Swimming Pool — Nebraska, 2006

Chlorinated public swimming pools can be a source of chemical exposure and pose a health risk if water chemistry and quality are not adequately maintained.

In December 2006, a Nebraska child was hospitalized in an intensive care unit for breathing problems after exposure to an indoor motel swimming pool. Twenty-three additional persons, four of whom sought medical care, also reported eye and respiratory illness after exposure to the same motel swimming pool.

The outbreak likely was the result of exposure to toxic levels of chloramines that had accumulated in the air of the enclosed space around the pool. Chloramines form when chlorine, a common disinfectant used in swimming pools, reacts with sweat, urine, and other human waste that accumulates in the water. They can remain in the water or evaporate into the air above the pool, causing a pungent smell.

Chloramines are not considered health hazards in outdoor swimming pools. However, in the enclosed space around indoor pools that are not adequately maintained, they can reach dangerous concentrations and cause the sudden onset of eye and respiratory tract irritation in swimmers and other persons in the indoor pool environment.

The Nebraska child had a severe case of chloramine toxicity which is not common; most people exposed to chloramines experience less severe symptoms.

This outbreak underscores that properly trained pool operators play a critical role in assuring swimmer safety. The operator of this state-licensed swimming pool was not required to be certified and had no verifiable training.

Public pool operators should be trained to maintain water chemistry within acceptable ranges and ensure adequate ventilation in indoor pool environments to prevent accumulation of unsafe levels of chloramines and minimize the associated health risks.

Inspection results reported in MMWR from the Indoor Pool associated with the Outbreak of Ocular and Respiratory Illness

Inspection of the motel pool on December 26 revealed multiple state health code violations, including cloudy water, a free chlorine level (0.8 ppm) less than half the minimum, a chloramine level (4.2 ppm) eight times the maximum, and a pH (3.95) approximately half the minimum.

Less severe violations included low alkalinity, inadequate daily logs, and an inoperable flow meter. Review of operator logs indicated deterioration of the pool's water quality during the weeks preceding the outbreak.

Before pool closure, the operator recorded inadequate combined chlorine levels for 26 consecutive days. Each log entry for combined chlorine on these days was at least three times higher than the acceptable limit of 0.5 ppm, ranging from 1.8-7.0 ppm.

During this same period, the operator also recorded pH levels below the lowest acceptable limit of 7.2 on 14 of 26 days and free chlorine levels below the lowest acceptable limit of 2.0 ppm on 5 of 26 days.

In addition to improper management of the water chemistry, the ceiling exhaust fan was turned off at the time of the outbreak, and the outside windows of the enclosed courtyard were closed because of cold outdoor air temperatures.

The pool was closed on December 26 and subsequently drained. It reopened February 7, 2007, and no additional illnesses have been reported.

Chlorination Basics

(Information obtained from WSEHA Pool Operators Manual)

Maintaining chlorine in the pool is one of the most important duties of any swimming pool operator. This article is a brief overview of chlorination and its effects.

Chlorine is essential to swimming pools for three primary reasons:

1. It acts as quick and lasting sanitizer,
2. It is an effective algaecide
3. It is a strong oxidizer of contaminants that are in the water.

Essentially it helps keep the water clear and free of disease causing pathogens.

State code requires that chlorine must be continually fed into the pool through some type of automatic dispensing chlorinator. Free and Total Chlorine residuals need to be checked at least daily and more often during times of high use and if adjustments to the pool chemistry are being made. As the above article from the CDC demonstrates it is very important to keep free chlorine levels at an adequate amount and to have as few as possible of the combined chlorine.

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When chlorine is dissolved in water it forms hypochlorous acid (free chlorine). Hypochlorous acid exists in pool water in two forms: Hypochlorous acid (HOCl) and hypochlorite ions (OCl^-).

HOCl (Hypochlorous Acid) <—> H+(Hydrogen Ion) + OCl^-(Hypochlorite Ion)

The pH of the pool water will dictate whether the form of free chlorine will be hypochlorous acid or Hypochlorite Ion. At a pH of 7.5 about half will be hypochlorous acid and half will be hypochlorite ions. As the pH increases more of the hypochlorous acid will be ionized into the Hypochlorite Ion.

This is important as Hypochlorite Ions are not nearly as good at disinfecting the water as Hypochlorous Acid. Thus maintaining a proper pH is also an important aspect of disinfecting the pool. For instance at a pH of 8.2 Hypochlorous Acid forms less than 20% of the free chlorine and does not provide adequate sanitization.

One of the functions of free chlorine is to remove organic wastes such as urine and sweat through a process called oxidation. During this process combined chlorines are formed, which produce an odor and irritates the eyes and skin. Usually the cause of high levels of combined chlorine are a result of not enough free chlorine to handle the organic load.

Definitions:

- **Free Chlorine** = The portion of the total chlorine remaining in chlorinated water that has not reacted with contaminants and is available to kill bacteria and other contaminants.
- **Combined Chlorine or Chloramines** = The portion of chlorine that has reacted and combined with ammonia, nitrogen containing contaminants, and other organics (i.e. perspiration, urine, other swimmer wastes) Chloramines cause eye irritation and odors and is only a weak sanitizer.
- **Total Chlorine** = The sum of both the free chlorine and combined chlorines.
- **Parts per million (ppm)** = A measurement that indicates the parts of a substance by weight in relation to one million parts by volume of pool water.
- **Shock Treatment / Superchlorination** = The practice of adding significant amounts of an oxidizing chemical to water to destroy ammonia, nitrogen-containing and organic contaminants. A strong chlorine smell could indicate that superchlorinating the pool maybe necessary.

Characteristics of Common Chlorine Compounds Used in Swimming Pools

	Sodium Hypochlorite	Calcium Hypochlorite	Dichlor	Trichlor
% Available Chlorine	5-15%	65%	56% or 62%	90%
pH Effect	Raises (pH 13.0)	Raises (pH 11.8)	Neutral (pH 6.9)	Lowers (pH 2.9)
Lost To Sunlight	Yes	Yes	No	No
Physical Appearance	Liquid	Granular, Pellets, Sticks and Tablets	Granular	Granular and Tablets
Hazards/Storage Concerns	Do not store in warm temperatures or in direct sunlight. Do not mix with acids, alkalies or other chemicals	Can be explosive and a fire hazard – Should be kept separate from all chemicals	Same as calcium hypochlorite - Also incompatible with calcium and sodium hypochlorite	Same as calcium hypochlorite - Also incompatible with calcium and sodium hypochlorite

Bushes & Trees Can Make Your Fence Climbable

Adding trees and bushes around the outside of your pool fence can make the pool area more attractive, but they also can provide a potential ladder for children to use to get over the fence.

If you plant bushes or trees outside the pool barrier, make sure they are bushes or trees that are not climbable or won't be climbable after they have had time to grow. If there are trees or bushes outside the fence of your pool area, they should be evaluated periodically to see if they are climbable.

It is suggested you contact the health department prior to putting anything outside of the pool fence that could reduce the effective height of the barrier around the pool so that it can be evaluated and determined whether there is a potential problem from the addition.

Bushes near fences such as this one should be evaluated to determine if they are climbable