

# NH Dept. of Environmental Services “Public Bathing Facility” Program



# A Pool Not Fit To Swim In: A Visual Guide

# Abbreviated Program Overview

- Approval (construction, renovation, etc.)
  - Permit process - design review - about 20 per year
- Inspection Program
  - Roughly 1,400 Public Facilities
  - Routine, Re-tests, Complaints, Illness, Pre-opening
  - Testing and bacterial analysis
  - Self-Inspecting Cities
- Enforcement
  - NOD, LOD, AO, AF
- Education
- Technical assistance
- Research

# What is a Public Bathing Facility?

Env-Wq 1102.44 “Public bathing facility” means a public bathing place that comprises a water-containing structure and associated buildings and equipment, intended or used for bathing, swimming, or diving purposes. The term includes, but is not limited to, swimming pools, spas, special recreation pools, and therapy pools at hotels, motels, health facilities, water parks, condominium complexes, apartment complexes, youth recreation camps, public parks, and recreational campgrounds or camping parks as defined in RSA 216-I:1, VII.

**The term does not include any bathing facility which serves 3 or fewer living units and which is used only by the residents of the living units and their guests.**



# Inspection Overview

- Water Quality
  - Clarity, disinfection, pH, temp, algae, bacteria etc.
- Circulation
  - Returns, drains and skimmers
- Equipment
  - Pumps, filters, gpm, psi, Hg, piping, disinfection
- Chemicals
  - Types, use and safe storage
- Testing and Record keeping
  - Rarely correctly or enough
- Safety
  - Barriers, depth markers, signage, rescue equipment
- Entrapment Avoidance
  - Plumbing, floor/ wall suction, covers, devices
- Toilets/Showers

# Water Quality Requirements

Parameter	Swimming, Wading, & Receiving Pools	Spas / Hot Tubs
Free Residual Chlorine (mg/L)	1 - 5	2 - 10
Combined Chlorine (mg/L)	0.5	0.5
Bromine (mg/L)	2 - 10	2 - 10
pH (units)	7.0 - 7.8	7.0 - 7.8
Temperature (°F)	89 Maximum	104 Maximum
Clarity	Main Drain(s)/Bottom Clearly Visible	Main Drain(s)/Bottom Clearly Visible
Cyanuric Acid (mg/L)	50	50
Total Coliform (CTS/100 mL)	< 1	< 1
Escherichia coli	ABSENT	ABSENT
Non-Coliform (CTS/100 mL)	< 200	< 200
Heterotrophic Plate Count (cfu/mL)	< 200	< 200
Pseudomonas aeruginosa	< 1	< 1

# A Few Stats From The Last Few Years

Number of Inspections	2410
Number of Samples Collected	4078
Notice of Deficiencies	359
Facilities with Bacteria	195
Water Quality Violations	1401
Safety Violations	844
On-Site Closure	125
New Permits	98

# How Do I Know What to Look For

## A Quick Walk-Around

- Sight
- Sound
- Smell
- Touch
- ~~■ Taste~~

# How Do I Know What to Look For

IDEAS???

# Water Clarity

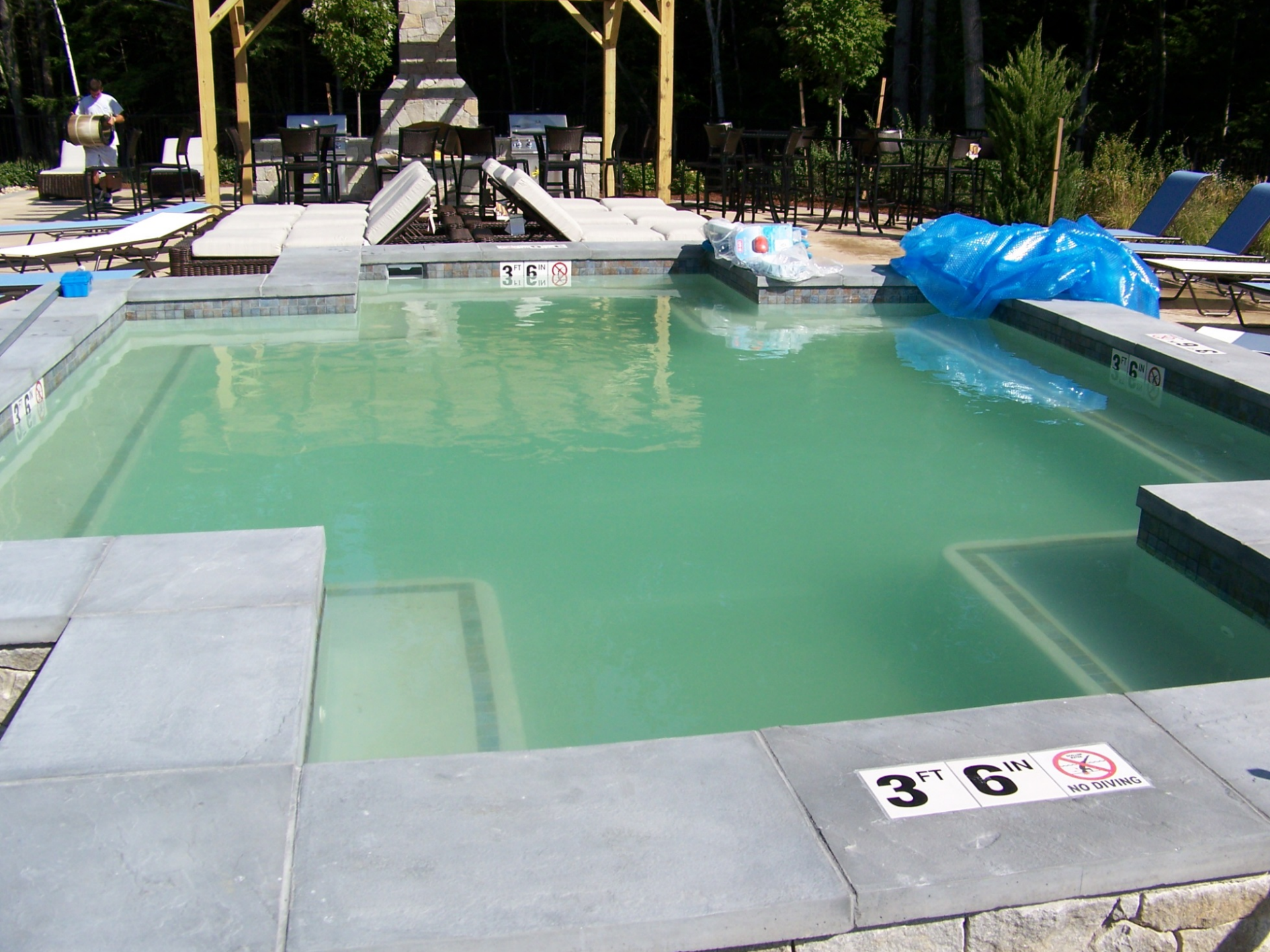


# Imminent Threat to Public Health

## CAUSES:

- Filtration
- Circulation
- Disinfection
- Water Balance
- Algae
- Air Entrainment





3 FT 6 IN NO DIVING

3 FT 6 IN NO DIVING

3 FT 6 IN NO DIVING











# Fall River Mass 2011





# Algae Etc

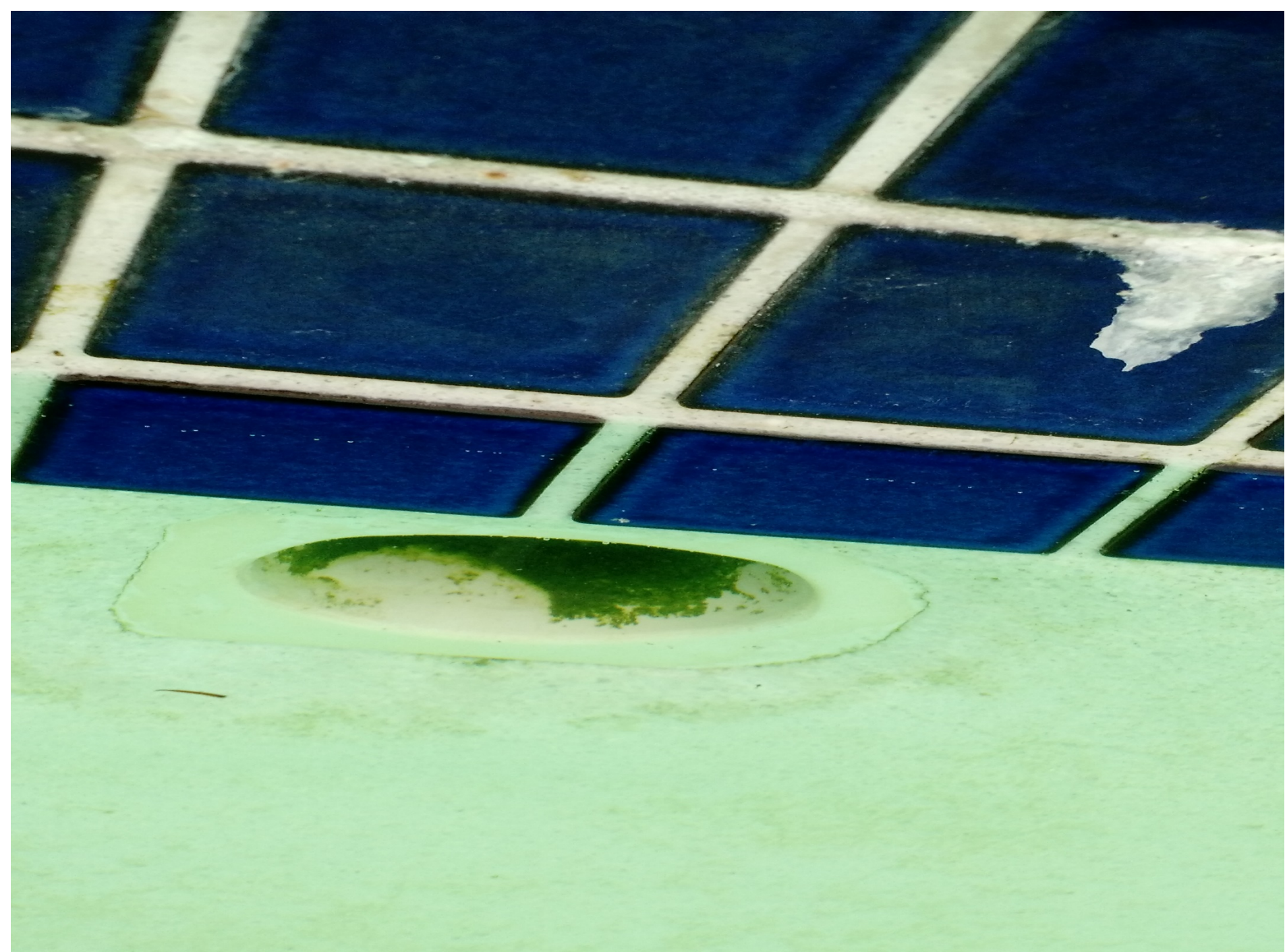
- Green Algae
- Black Algae
- Mustard Algae
- White Water Mold
  
- Touch-Slimy walls











# Circulation – The Basics

Suction side – Provides water to the pump:

Skimmers/Gutters

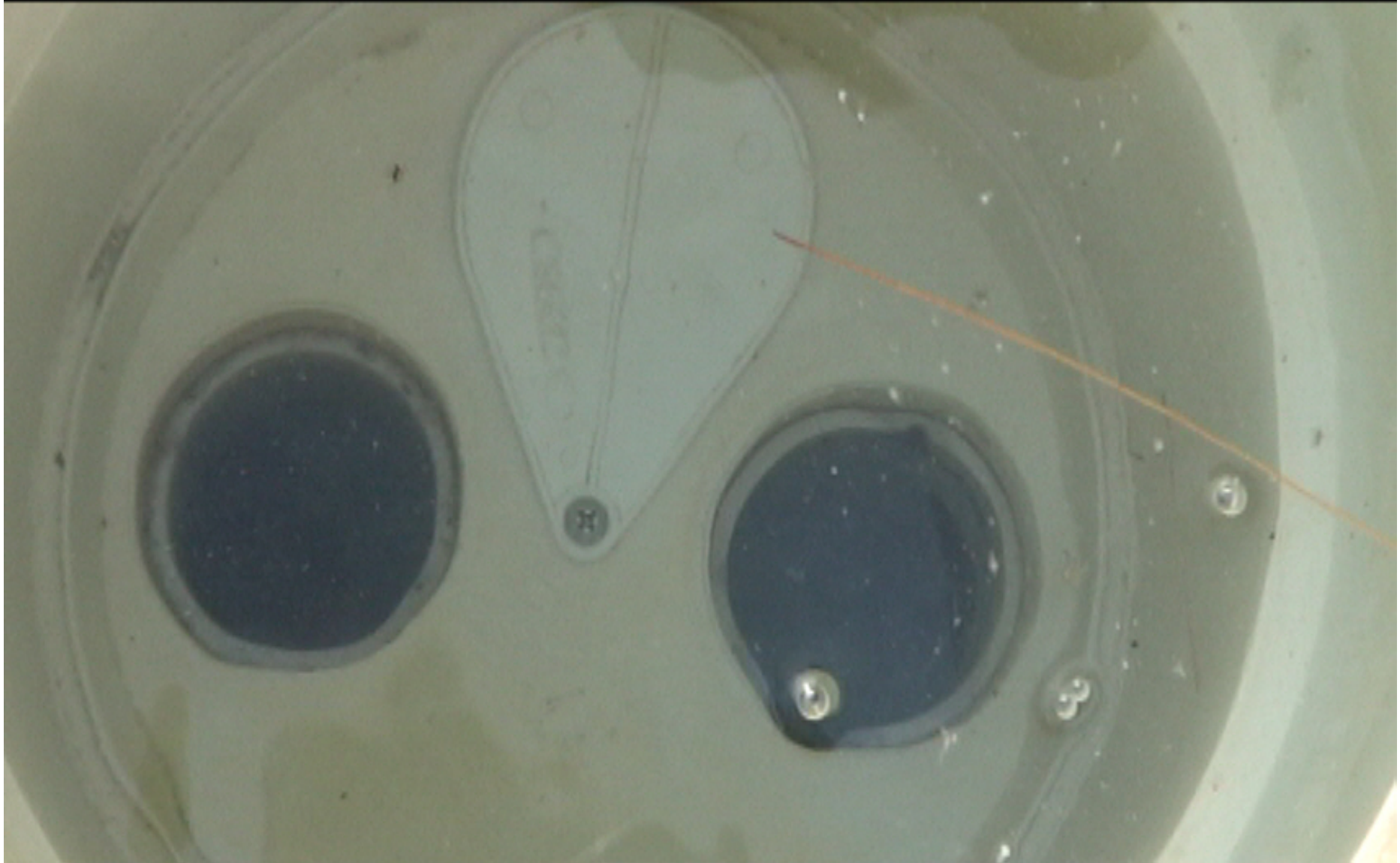
Drains/Outlets

Pressure side – Circulation within the pool

Returns/Inlets

Diluting Dirty Water with Clean Water

# Skimmer Function – Lift the Lid



# Skimmers

- Water Level is Critical! Under and Over
- Circulation stops
- Surface removal of contaminants
- lighter than water
- Largest



# Water Level

- Overflow
  - Largest concentration of contaminants
  - Lighter than water
  - Pollen, leaves and needles, dust, grass, algae, mucous (“Spit –n- Snot”), bodily fluids, lotions, oils, etc.
- Minimum of 50/50% More is better! 80/20
- Convey water to the pump















Oh No You Didn't









# Importance of Inlets

- Distribution of filtered, disinfected, heated water
- Responsible for circulation within the pool
- Direct water to dead spots – EYEBALLS
- Up or Down?

# Water Movement



# What's that Smell?

## Leading Pool Myth

I can smell the chlorine from the hotel lobby!

# What's that Smell?

Strong odor associated with pools .....IT'S NOT CHLORINE

Free Chlorine Reacting with Urine/Sweat = CHLORAMINES

Responsible for most complaints

- Irritation of eyes and mucous membranes,

- Rashes

- Respiratory issues – Asthma attacks

**Largest contribution from pee in the pool**

# What's that Smell?

Chloramines are volatile and off-gas

Mono-chloramine , Di-chloramine , Nitrogen Trichloride

Air-Water Interface

Exacerbated by agitation of the water

Swim Teams, Water Aerobics, Water Features, Hot Tubs

Poor Ventilation and lack of Fresh Air

Other Sources



# What's that Smell?

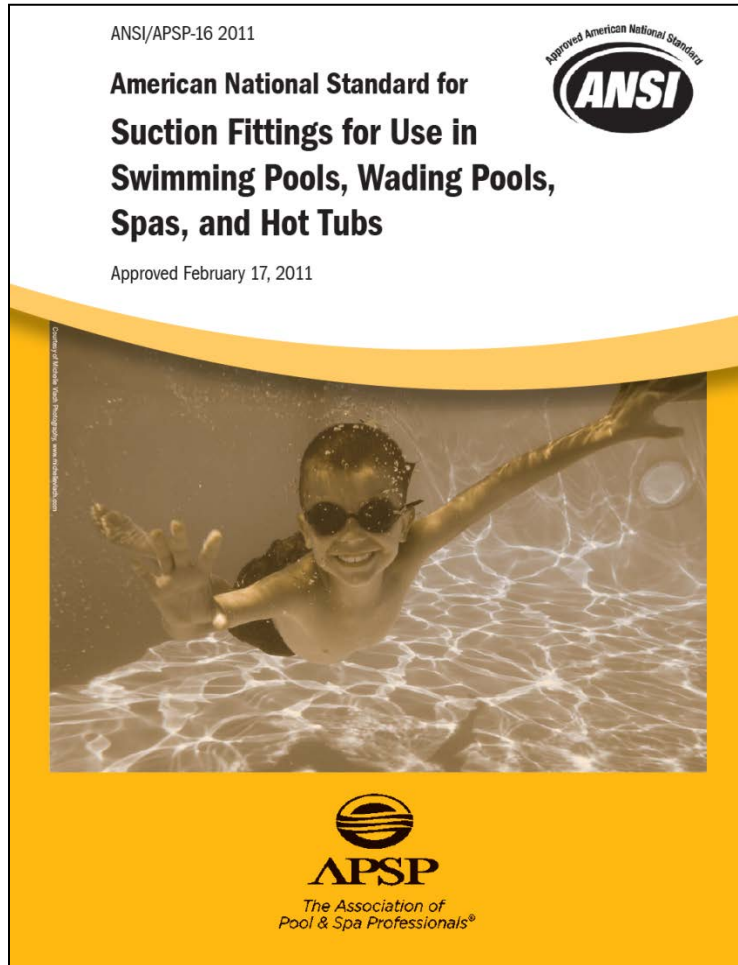
Very hard to treat chemically for busy pools - Health Clubs

Shocking requires good ventilation and fresh air

UV treatment

Not a big problem in outdoor pools

# Drain Covers – VGB Approved



## Env-Wq 1102.12 “Cover/grate”

means a covering fitting or assembly that separates the bather from the suction sump or piping, sometimes referred to as a “grate” or a “cover.”

# Env-Wq 1104.07

## Suction Outlet Cover/Grate

- (a) The operator of a PBF shall inspect each cover/grate daily to insure the cover/grate has not been damaged and is securely attached.
- (b) The owner of a PBF shall not allow bathers to use the PBF if any cover/grate is missing, broken, or secured in such a way that it can be removed without the use of tools.

Results in immediate on site closure











NO DIVING  
ALLOWED

WITOMED  
300 HAZARD

3





09/03/2009





LISTED



(1 1/2")  
FLOOR  
177 GPM



(1 1/2")  
WALL  
122 GPM

(1 1/2")  
WALL  
122 GPM



Covers must be  
securely fastened  
with supplied  
hardware and  
installed according to  
mfg instructions





# Entrapment Avoidance

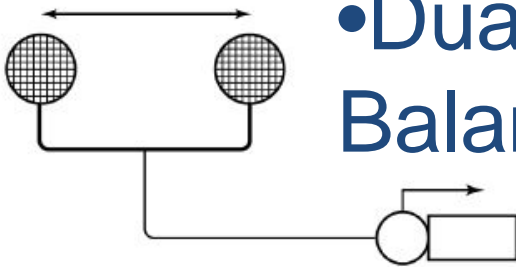
- Types of Entrapment
  - Body Entrapment
  - Hair Entrapment
  - Limb Entrapment
  - Evisceration/Disembowelment
  - Mechanical Entrapment

# Layers of Protection



- Approved Anti-Entrapment Covers

minimum distance 3 feet (914 mm)  
apart (centerlines)



- Dual or multiple outlets Hydraulically Balanced or Unblockable Drain



- Safety Vacuum Release System (SVRS)



- Emergency Shut Off Switch for all spa pumps

















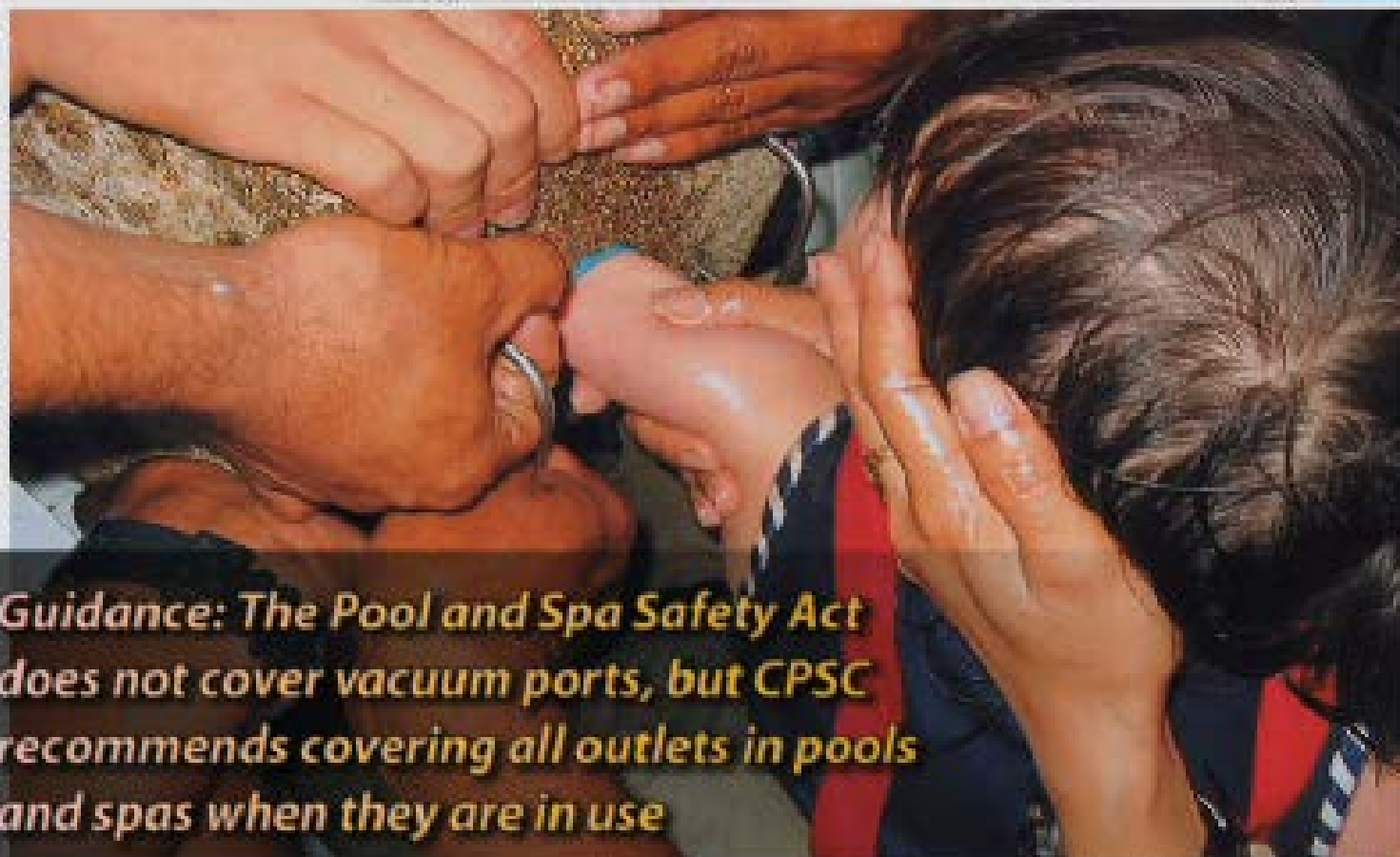
ELSEVIER

CASE RE

Limit

suct

app



N.A. **Guidance: The Pool and Spa Safety Act does not cover vacuum ports, but CPSC recommends covering all outlets in pools and spas when they are in use**

Look

ASCI

...showed an un-displaced  
fracture of the second metacarpal  
to have...

...the deaths occurred in swimming  
pools full of water. The CPSC also issued  
on prevention of...

Toosy, D. Brox

er extrication.

ite failed to  
duct Safety  
26 cases of  
in 23 deaths









# Testing and Record Keeping

The operator of a PBF shall:

Conduct tests for disinfectant residual and pH prior to opening the PBF to the public and every 4 hours during operation. Temp for spas

Maintain dated daily logs for the PBF for a rolling 12-month period; and

Make the records available to the department and patrons of the PBF upon request.



# Ask them for the records

Free Chlorine 1-5 ppm

pH 7.0-7.8

Spa Temp Max 104

Ask Them to test?

1.3			3.0	3.4	
0.5			0.6	0.6	
7.4			7.4	7.4	7.4
100			100	100	
350			350	350	
I			1	2	5
91			91	91	91
Clear			Clear	Clear	Clear
1 TAB CHL					
Closed pool @ 4:30 Someone jumped in pool. Cleaned as best we could. -WK-					
RV			TL	TL	
			1		
			✓		
			✓		
			✓		
			✓		✓

You do a test  
Wanna take a dip?







3 EASY STEPS:

- 1 DIP STRIP & REMOVE
- 2 WAIT 15 SECONDS
- 3 COMPARE

KEEP CAP ON TIGHT.  
STORE AT ROOM TEMPERATURE.

[www.AquaChek.com](http://www.AquaChek.com)



FOR BEST RESULTS ON STAB  
7.0 - 8.4 AND ALKALINITY AT  
1242ALBB R5/10 U.S.

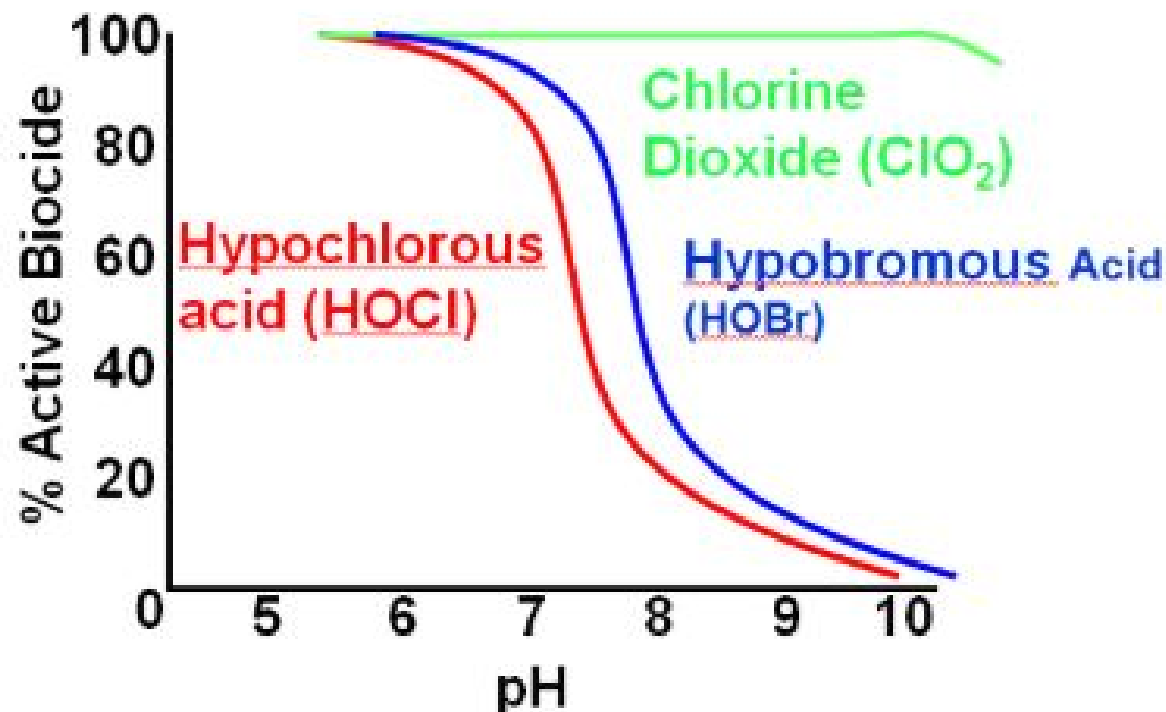
IT, pH SHOULD BE BETWEEN  
W 240 PPM. MADE IN USA  
5,030,842; 6,432,717



# Chemistry

Graph of disinfection efficacy according to pH

Graph of disinfection efficacy according to pH



Effectiveness is Maintained in Alkaline Waters

# Pool Discharge







# Discharge to Meredith Bay





# Discharge to the Pemigewasset



Thanks!