POOL & SPA SAFETY

A Training Course for Pool and Spa Operators

Revised April 2017

THE CITY OF COLUMBUS
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COLUMBUS PUBLIC HEALTH

Topics

- **SECTION I:** INTRODUCTION TO POOLS AND SPAS
- **SECTION II:** PUMP ROOM OPERATIONS
- **SECTION III:** POOL OPERATIONS
- **SECTION IV:** RECORD KEEPING
- **SECTION V:** FACILITY SAFETY
- **SECTION VI:** DESIGN REQUIREMENTS
- **SECTION VII:** SIGNAGE
- **SECTION VIII:** SPRAY GROUNDS
- **SECTION IX:** RENOVATIONS
- **SECTION X:** CITY OF COLUMBUS CLOSURE & ENFORCEMENT PROCEDURES

SECTION I:
INTRODUCTION TO POOLS AND SPAS

Purpose of Pool and Spa Safety

- **Protect the public from possible safety and health hazards**
- Provide a basic knowledge of regulations from the health code
- Build a good relationship between pool operators and the health department

Rules and Regulations

- **Columbus Public Health (CPH)**
  - Local Health Agency
  - Licenses, inspects, and enforces regulations concerning aspects such as: water chemistry, physical hazards, safety, and required postings on display.
- Ohio Department of Health (ODH)
- Occupational Safety and Health Administration (OSHA)
- Center for Disease Control and Prevention (CDC)
- Consumer Product Safety Commission (CPSC)
- U.S. Department of Justice – Americans with Disabilities Act (ADA)

Rules and Regulations

- Ohio Revised Code Chapter 3749
- Ohio Administrative Code 3701-31
  - Specifically OAC 3701-31-**04**
    - *Responsibilities of the licensee*
- Columbus City Health Code (CCHC) Chapter 227

Public Health Concerns

- It is possible to spread disease from person to person via pool or spa water
- Common forms of these diseases include:
  - ***E. Coli 0157:H7***
  - **Hepatitis A**
  - ***Giardia***
  - ***Cryptosporidium* (Crypto)**
- Disinfecting and keeping proper water balance in your pool will reduce the risk of these pathogens

Germ Inactivation Time for Chlorinated Water

Germ	Time
E. Coli 0157:H7	Less than 1 minute
Hepatitis A	About 16 minutes
Giardia	About 45 minutes
***Cryptosporidium* (Crypto)**	About 15,300 minutes or 10.6 days

***Water chemistry maintained at ideal conditions & disinfection times longer when using Cl Stabilizer (CYA)

Authorized Representatives

- Licensee must provide an authorized representative that holds current training
- Training must be obtained through an agency approved by ODH
- Authorized representative must have basic knowledge or swimming pool equipment, operations, and safety
- Authorized representative must be onsite or within 30 minutes of facility at any time pool is open for use
- Training must be obtained within 3 years of the effective date of revised rules

SECTION II: PUMP ROOM OPERATIONS

Pool Capacity

- Know the capacity of your pool

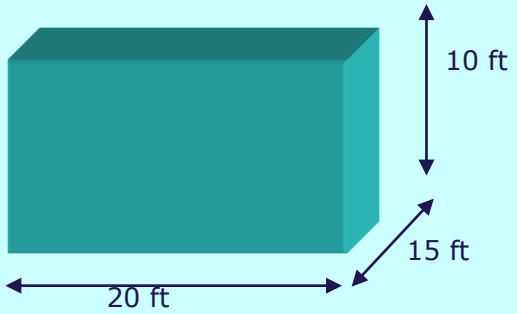
Pool Capacity = Pool Volume x 7.5

For a rectangular pool with no slope…

Volume = Length x Width x Depth

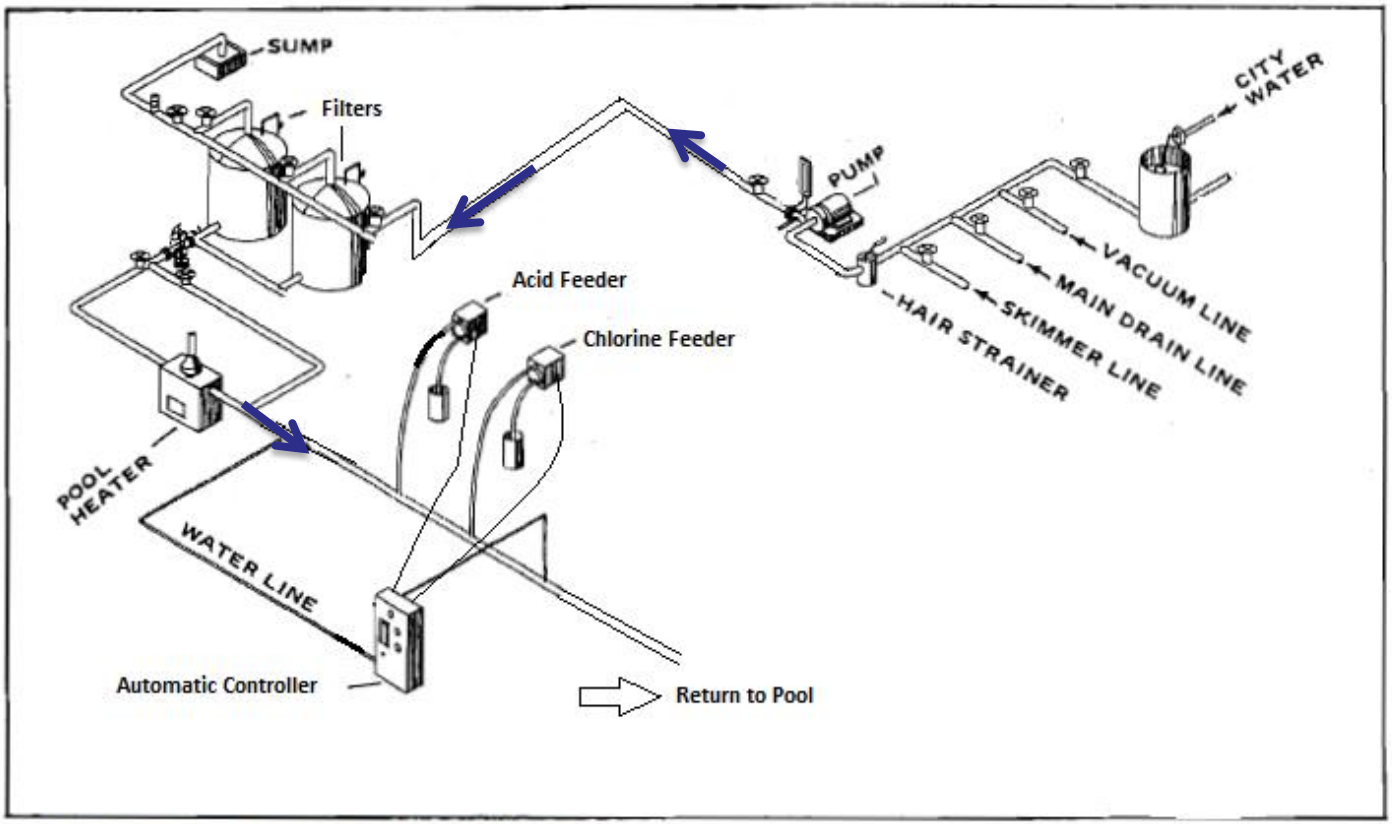
Volume = 20 ft x 15 ft x 10 ft = 3,000 ft^3

Pool Capacity =
Volume x 7.5 =
3,000 ft^3 x 7.5 =
22,500 Gallons



SECTION II: PUMP ROOM OPERATIONS-

PUMP ROOM FLOW



Adapted from a diagram developed by the CDC

Hair and Lint Traps

- Must have a hair and lint trap connected to circulation system
- Comes before the main filter and cleans out large debris
- If using a vacuum diatomaceous earth (DE) filter, you may not need a hair and lint trap, as the DE filter itself acts as the trap

Filters – *Follow manufacturer's instructions*

Sand Filters

- Water is pushed through fine sand media and particles are filtered out

DE Filters

- Use diatomaceous earth (DE) powder
- Able to remove the smallest particles of all pool filters
- Pressure or vacuum systems

Cartridge Filters

- Pleated filter sheets that rid water of contaminants and particles


Sand Filter


DE Filter


Cartridge Filter

Filter Media Rate and Filter Area

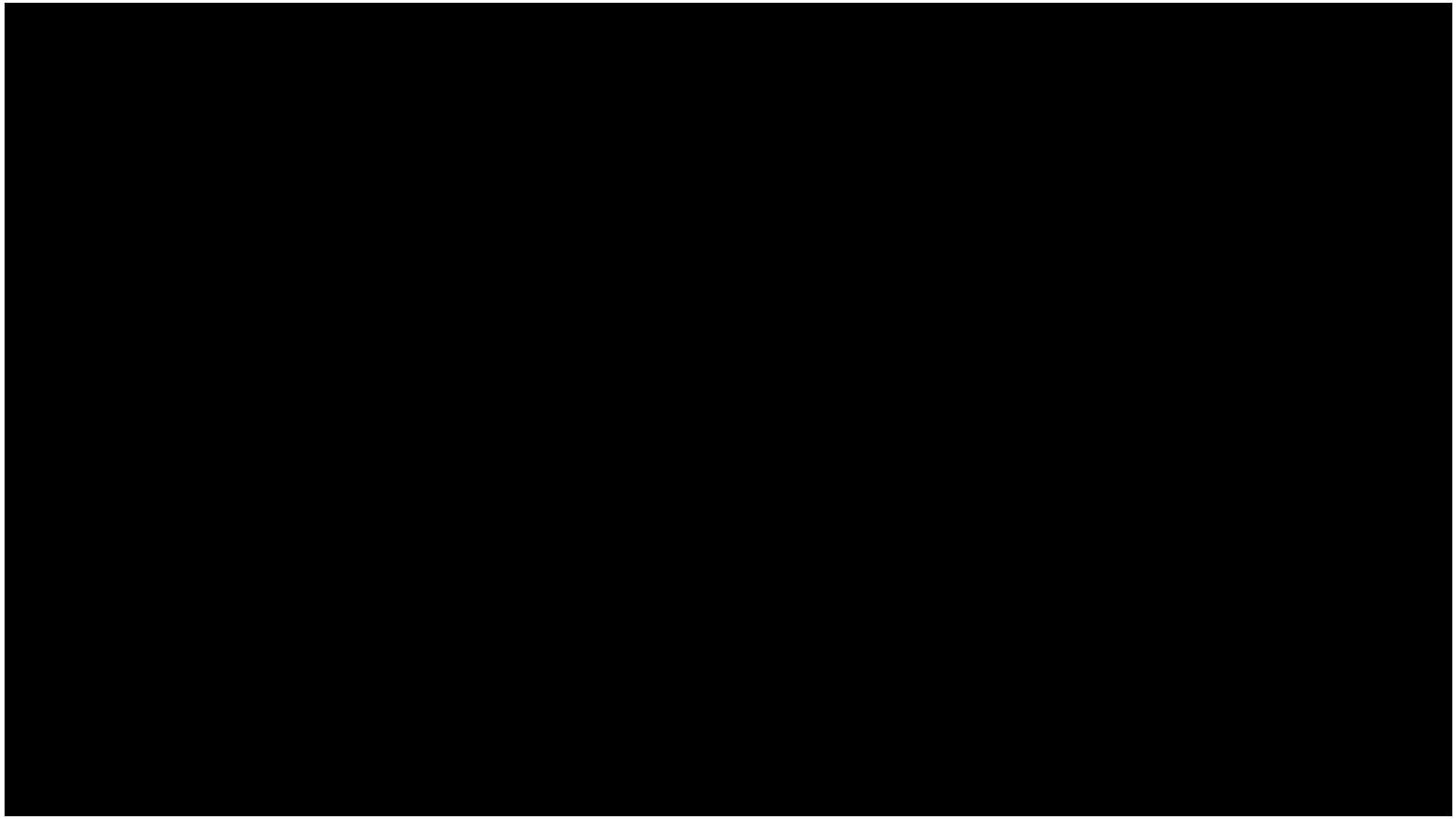
- **Filter Media Rate (FMR)** = Specific flow a filter can handle
  - Measured in GPM/ft^2
  - Never exceed the filter's FMR

FILTER TYPE	FILTER MEDIA RATE
Cartridge	0.375gpm/ft^2
Diatomaceous Earth	2.0 gpm/ft^2
Diatomaceous Earth with Slurry	2.5 gpm/ft^2
Rapid Rate Sand	3.0 gpm/ft^2
High Rate Sand	12-20gpm/ft^2

- To determine the **Filter Area (FA)** and the number of filters you will need, calculate the flow rate and use the equation below:

Filter Area (FA) = Flow Rate (FR) ÷ Filter Media Rate (FMR)

Filters and Flow Video



Sodium Hypochlorite - *Liquid Chlorine*

- Most common disinfectant
- Strength for pools and spas is 10-12% "available chlorine content" and pH of 13 (high)
  - Correct high pH by adding an acid such as muriatic acid or inject CO_2

Calcium Hypochlorite - *Cal-Hypo*

- Dry form of chlorine
- Comes in three forms:
  - Tablet
  - Granular
  - Briquette
- Tends to raise the pH
- Also can cause high levels of calcium


Tablet Cal-Hypo


Granular Cal-Hypo


Briquette Cal-Hypo

Types of Disinfectants

Tri-chlor and Di-chlor

Tri-chlor

- Dry tablet or stick form
- Will lower pH levels
- Cyanuric acid (CYA) stabilizer included

Di-chlor

- Dry tablet form
- Nearly neutral pH
- Used when pH control is of concern
- Cyanuric acid (CYA) stabilizer included

Bromine

- Typically in solid form
- Works like chlorine
- Used mostly in spas & some indoor pools
- Less odor and less irritating than chlorine
- Quickly becomes ineffective in sunlight
- More stable at higher temperatures

Types of Disinfectants

Salt

- Salt is typically added to the swimming pool
- Solution passes through an electrolytic cell which produces chlorine
- Proper level is about 3000 to 3500ppm
- Too high causes corrosion damage to metallic equipment

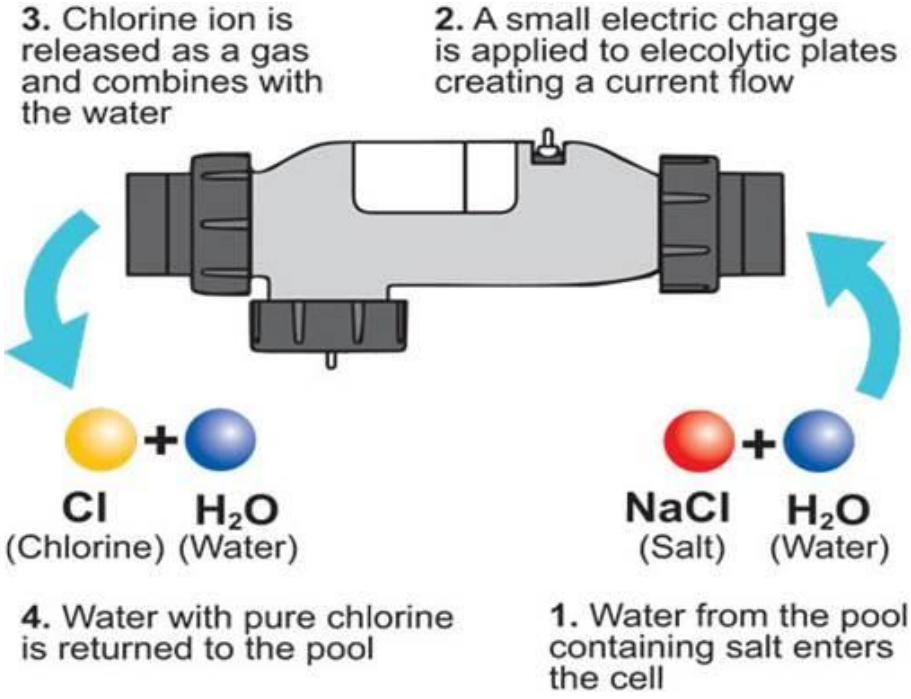


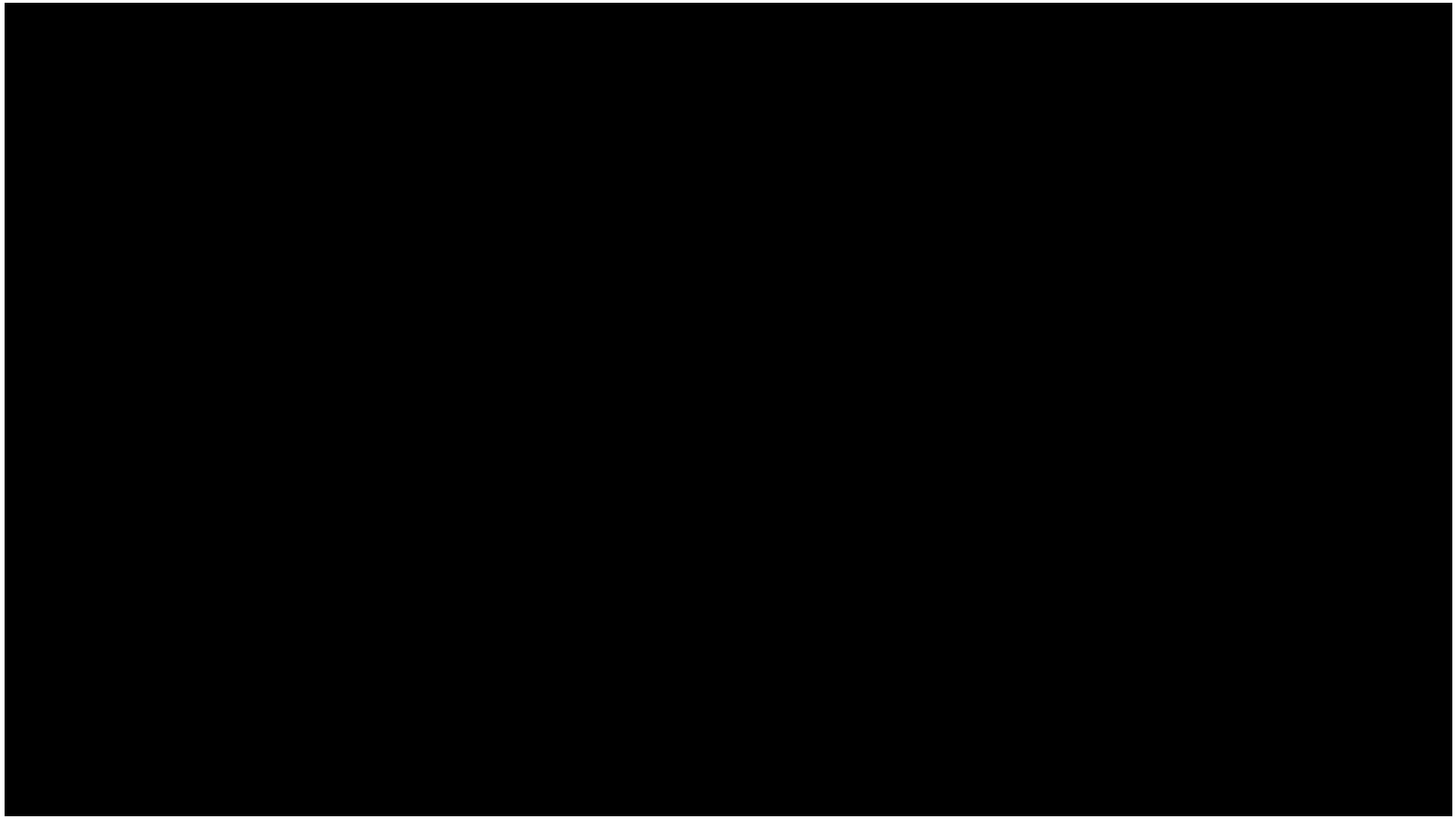
Photo: http://www.iapmonline.org/Documents/archive/20130422_Saline_Pool_Systems.aspx

Salt

Salt Chlorine Generators

- Remember to keep units cleaned and calibrated.

Disinfectants Video



Disinfection Systems

Not Acceptable

Disinfection Systems

Erosion Feeders

- Work with chemicals in solid forms
- Water is forced past chemical tablet and dissolved into the circulation system downstream of filters & other components
- Solenoid needed when connected to an automatic controller

Liquid Solution Feeders

- Liquid disinfectant fed into water downstream of filters & other components
- Make sure the pressure is sufficient

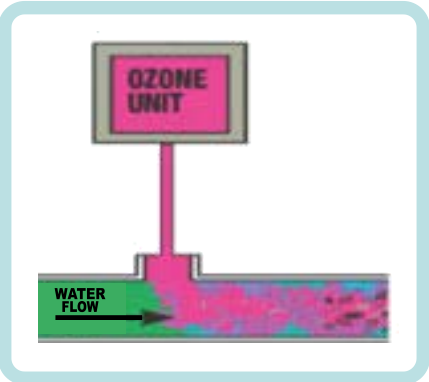
Liquid solution feeder

Secondary Disinfection Systems

(Used in Addition to Primary System)

Ozone Generators

- Gas
- Can be hazardous to humans
- Gas injected into water
- All ozone should be used up before entering pool



Ultraviolet (UV) Systems

- UV lamps to generate UV radiation to disinfect
  - Oxidize chloramines

***Must use chlorine or bromine in addition to these supplemental disinfectant methods

Disinfection Control and Automatic Controllers

- Must measure levels and **adjust** when too low or too high
  - ORP (Oxidation Reduction Potential) – Disinfectant reading
  - pH
- Spas **must** have automatic disinfection (interlocked with the circulation p
- **Hand dosing continuously is not allowal**

Disinfection Control and Automatic Controllers

Broken Flow Switch (Not Acceptable)

Alarming with Low pH

Turnover Rates, Flow Rates, & Flow Rate Indicators

Turnover Rate

- Amount of time it takes for the total amount of water of the pool to go through the circulation system
- Minimum Turnover Rates…
  - Pools = 8 hours
  - Wading Pools = 2 hours
  - Spas/Spray Ground = 30 minutes

Flow Rate

- Rate of water flow through the circulation system
- Measured in gallons per minute (gpm)
- Measured using a flow meter or pump curve

To determine the pool or spa's minimum flow rate…

1. Calculate the capacity (shown on previous slide): Pool capacity = 22,500 gallons

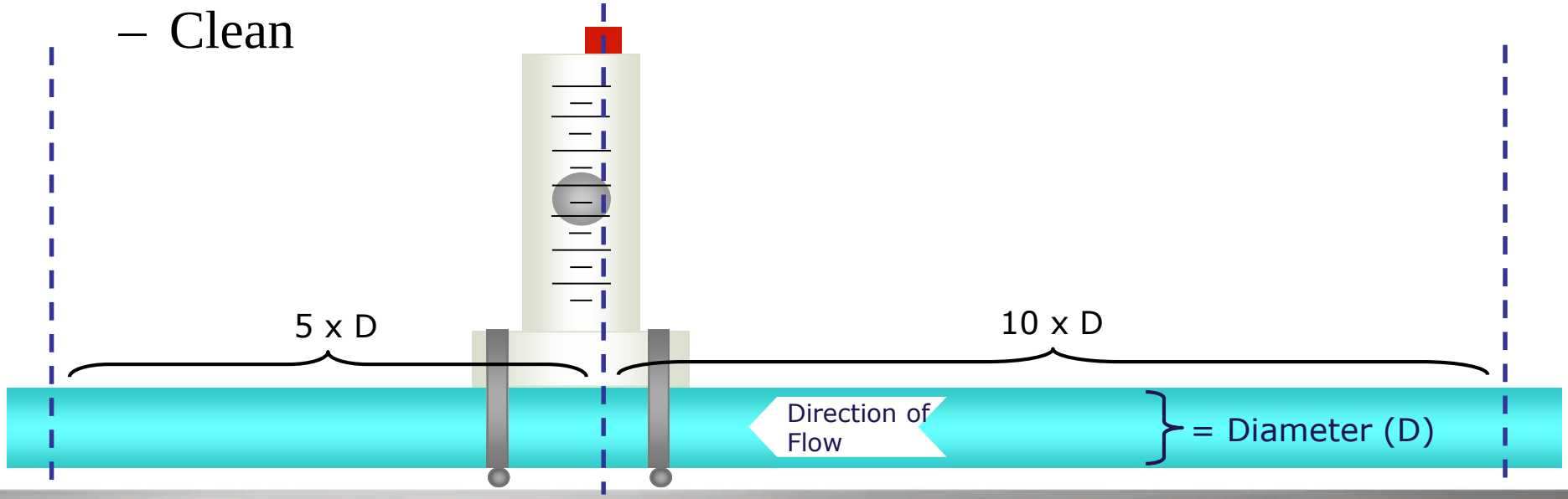
2. Determine the minimum turnover rate: Public swimming pool requirement = 480 min
   (8 hrs x 60 = 480 min)

3. Calculate flow rate in gallons per minute Flow Rate = Pool capacity/Turnover rate
   Flow Rate = 22,500 gallons / (480 minutes) = 46.875 gallons per minute

Turnover Rates, Flow Rates, & Flow Rate Indicators, *Continued*

Flow Meter

- Must have a length of straight pipe before and after the flow rate indicator
- Make sure the float isn't stuck
  - Clean



Turnover Rates, Flow Rates, & Flow Rate Indicators, *Continued*

Pump Curve

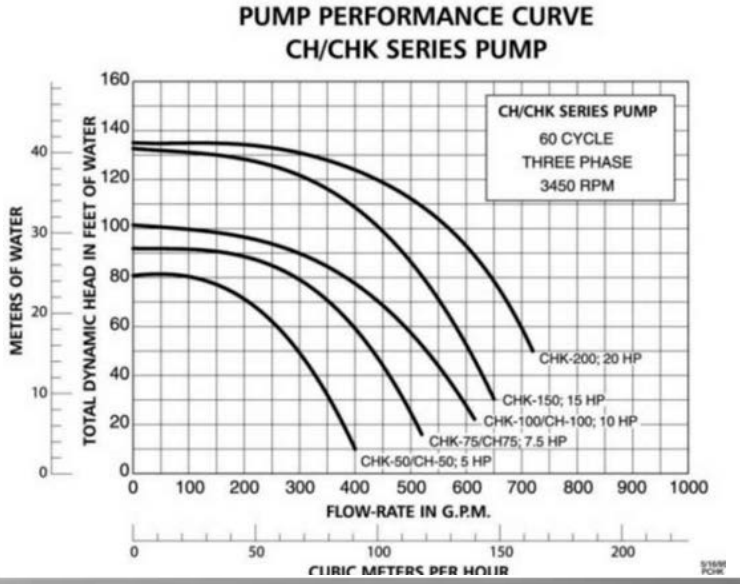
- Uses the vacuum reading and pressure reading to determine the total dynamic head
  - psi & In Hg
- Total dynamic head is used to determine the rate of flow on the pump curve chart
  - Specific to each type of pump

Example:

Pressure gauge 20psi x **2.31** = 46 feet of head

Vacuum gauge 10inHg x **1.13** = 11 feet of head

Total Dynamic Head = 57 feet of head



Equipment Maintenance

- Equipment and equipment room should be well-kept and in proper working condition
  - Can be neglected because hidden from view
- Should also be:
  - Clean and well-drained
  - Adequately lit and ventilated
  - Not accessible to bathers and patrons

Hazardous Materials Care

***Always see the manufacturer's instructions for specific safety precautions*

- **Moisture**
  - Store chemicals in a dry area off of the floor
- **Improper Mixing**
  - Do not mix chemicals, even if they are the same type of product
    - Muriatic acid and liquid chlorine (Storage)
- **Protection**
  - Personal protective equipment and safety data sheets (SDS) should be on-site for employees

Hazardous Materials Care

Not Acceptable

SECTION III: POOL OPERATIONS

Chlorine Chemistry

- **Free Chlorine** = Available disinfectant
- **Combined Chlorine** *(aka Chloramines)*= Result of free chlorine reacting with organic compounds containing nitrogen (N)
  - Sources of organic compounds containing nitrogen are urine, sweat, and the environment

$$HOCl + NH_3 = NH_2Cl + H_2O$$

Disinfectant	Organic Compound containing Nitrogen	Combined Chlorine	Water

Free Chlorine

To calculate the Free Chlorine:

Free Chlorine = Total Chlorine – Combined Chlorine

- Pools **not using** cyanuric acid or stabilized chlorine products should maintain free chlorine at a minimum of 1 ppm for pools and 2 ppm for spas
- Pools **using** cyanuric acid or stabilized chlorine products should maintain free chlorine at a minimum of 2ppm for pools and 3ppm for spas
- Free chlorine levels should never exceed 10ppm or the upper limit of your facility's test kit (flashing) whichever is lower
- Too much can cause irritation
- Too little will not eliminate harmful pathogens

Combined Chlorine

To calculate the Combined Chlorine:

Combined Chlorine = Total Chlorine – Free Chlorine

- Combined chlorine is ideally ZERO and should not exceed 1ppm
- Too much will cause irritation and can create the “chlorine” smell in indoor facilities
- Combined chlorine can be eliminated or reduced by superchlorination or draining

Superchlorination - *Shocking*

- Method of adding a large dose of chlorine
  - Superchlorinate, as needed, when combined chlorine levels exceed 0.4 ppm
  - The dose should be 10 times the amount of combined chlorine to achieve breakpoint chlorination
  - Subtract the free chlorine that is already in your pool
- High combined chlorine levels can be irritating
  - The level should not exceed 1.0ppm
- Superchlorinate in late afternoon or evening **after patrons have gone**
- Ventilate indoor areas because of chlorine gas build-up
- Evenly distribute chlorine for superchlorination (unless it is a fecal-related incident)

Other Water Balance Factors

	pH	Total Alkalinity	Calcium Hardness
What is it?	Measurement of hydrogen ions in the water. Human tears have a pH of about 7.5, and the ideal range in your water is 7.4-7.6	Ability of the water to resist changes in pH. A "buffer" for pH changes in the water.	Calcium present naturally in water due to leaching in nature
Too high?	Scaling water (clogged filters and heating elements, reduced circulation, cloudy water), chlorine inefficiency, eye/skin irritation	pH lock, cloudy water, rough pool/spa surfaces, clogged filters and heater elements, reduced circulation	Scaling water, rough pool/spa surfaces, clogged filters and heater elements, cloudy water, reduced circulation, eye/skin irritation
Too low?	Corrosive water (etching of pool/spa surface, metal corrosion), chlorine loss, wrinkles in vinyl liners, eye/skin irritation	pH bounce, etching of pool/spa surfaces, staining of surface walls, heater failure	Corrosive water, etching of pool/spa surface, staining of surface walls, heater failure

Temperature

- In **pools**: not above 90°F
- In **spas**: not above 104°F
- Unless otherwise approved

- High temperatures can cause the disinfectant to quickly evaporate

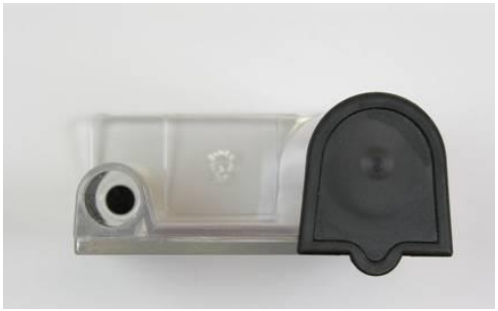
SECTION III: POOL OPERATIONS–

CYANURIC ACID

- Cyanuric acid is a chemical that lessens the effect of free chlorine breakdown by sunlight
- Can make free chlorine less effective
- Most effective between 30-50 ppm
- State law requires cyanuric acid to be maintained at 70 ppm or below and level test at least once a week
- Does not break down or evaporate
- Can only be removed from pool by draining and adding fresh water
- Should not be used in indoor pools or pools using bromine as a disinfectant

CYANURIC ACID

- Some solid forms of chlorine contain cyanuric acid
  - Tri-chlor
  - Di-chlor
- Can be added to pool as a supplement



SECTION III: POOL OPERATIONS–

Water Quality Parameters

	Required Levels	Ideal Levels
Free Chlorine	Pools: At least 1 ppm* Spas: At least 2 ppm* Pools w/ CYA: 2ppm* Spas w/ CYA: 3ppm*	Pools: 2-4 ppm Spas: 3-5 ppm
Combined Chlorine	Less than 1 ppm	0 ppm
Bromine	Pools: At least 3 ppm Spas: At least 4 ppm	Pools: 3-5 ppm Spas: 4-6 ppm
pH Values	7.2-7.8	7.4-7.6
Total Alkalinity	At least 60 ppm	80-100 ppm
Cyanuric Acid	Less than 70 ppm	30-50 ppm
Calcium Hardness	Pools: N/A Spas: N/A	Pools: 200-400 ppm Spas: 150-250 ppm
Temperature	Pools: Not above 90°F Spas: Not above 104°F	Pools: Not above 90°F Spas: Not above 104°F

***Free chlorine residual shall not Exceed 10ppm or the upper limit of the facilities test kit, whichever is lower**

Water Quality Parameters

See Appendix iv (Water Balance Adjustment Guide)

- **Increase Total Alkalinity**
  - Sodium Bicarbonate (Baking Soda)
  - Sodium Carbonate (Soda Ash)
  - Sodium Sesquicarbonate
- **Decrease Total Alkalinity**
  - Muriatic Acid (31.4%)
  - Sodium Bisulfate (Dry Acid)
- **Increase pH to Ideal**
  - Sodium Carbonate (Soda Ash)
- **Decrease pH to Ideal**
  - Muriatic Acid (31.4%)
  - Sodium Bisulfate (Dry Acid)

- **Increase Calcium Hardness**
  - Calcium Chloride (77% or 100%)
- **Increase Stabilizer**
  - Cyanuric Acid
- **Neutralize Chlorine**
  - Sodium Thiosulfate
  - Sodium Sulfite

Testing the Water

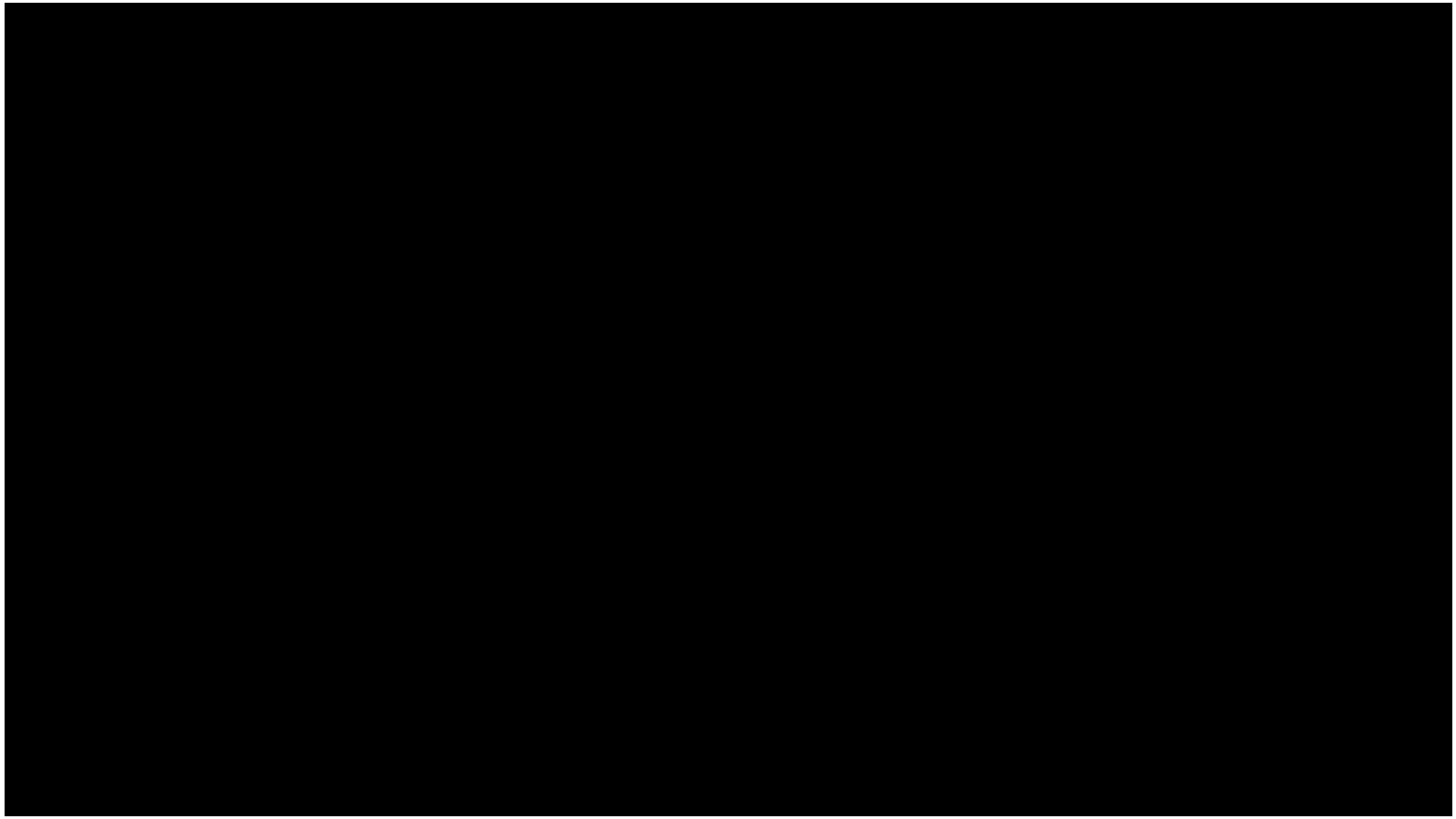
- Licensed aquatic facilities must have a diethyl-p-phenylediamine (DPD) test kit
- Read test kit directions
- Store in a cool dark place
- Keep equipment clean
- Do not mix test kits
- Replace reagents yearly

http://www.spectralightuv.com/pool-test-kits

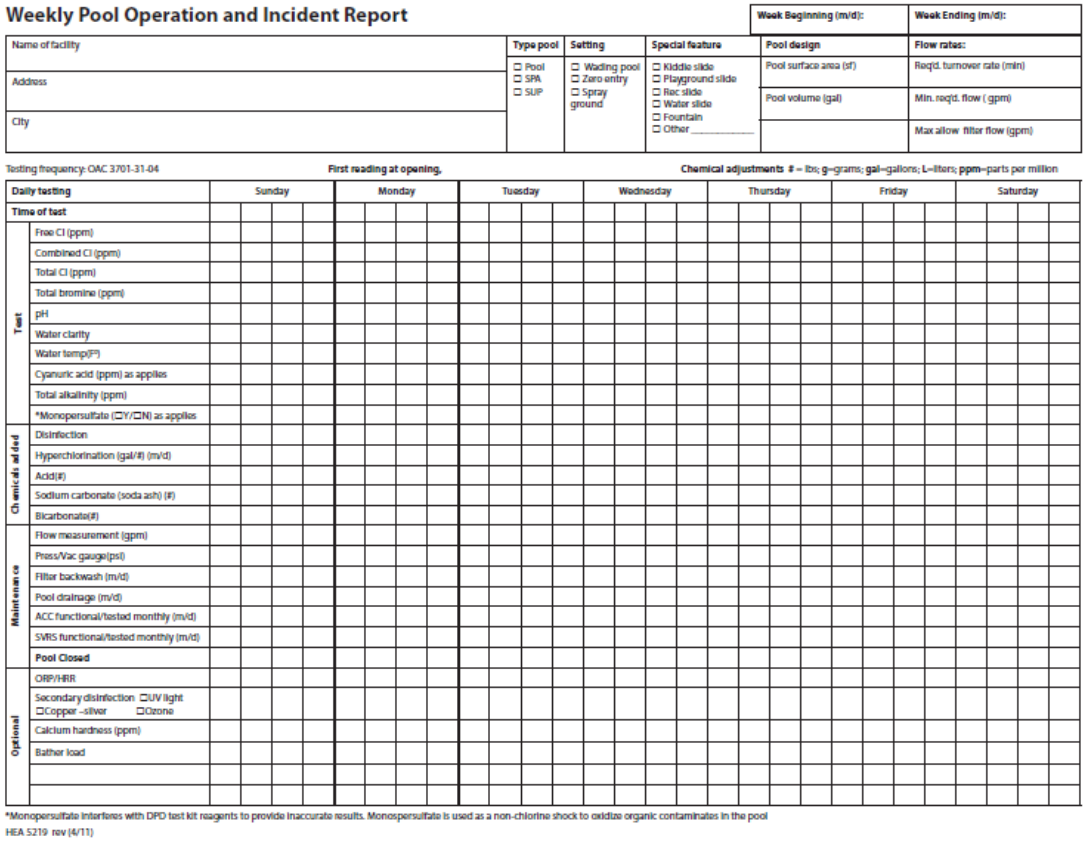
Draining Requirements

- Spas must be drained at least once every 30 days.
- Pools are not required to be drained but it may be necessary when water balance concentrations are off and no other solution is successful.

Water Chemistry Video



SECTION IV: RECORD KEEPING



Weekly Pool Operation and Incident Report

Week Beginning (m/d):	Week Ending (m/d):

Name of facility	Type pool	Setting	Special feature	Pool design	Flow rates:
Address	☐ Pool ☐ SPA ☐ SUP	☐ Wading pool ☐ Zero entry ☐ Spray ground	☐ Kiddie slide ☐ Playground slide ☐ Rec slide ☐ Water slide ☐ Fountain ☐ Other _____	Pool surface area (sf)	Reqtd. turnover rate (min)
City				Pool volume (gal)	Min. reqtd. flow (gpm)
					Max allow filter flow (gpm)

Testing frequency: OAC 3701-31-04 — **First reading at opening.** — **Chemical adjustments** # – lbs; g–grams; **gal**–gallons; **L**–liters; **ppm**–parts per million

	Daily testing	Sunday				Monday				Tuesday				Wednesday				Thursday				Friday				Saturday			
	Time of test																												
Test	Free Cl (ppm)																												
	Combined Cl (ppm)																												
	Total Cl (ppm)																												
	Total bromine (ppm)																												
	pH																												
	Water clarity																												
	Water temp(F°)																												
	Cyanuric acid (ppm) as applies																												
	Total alkalinity (ppm)																												
	*Monopersulfate (☐Y/☐N) as applies																												
Chemicals added	Disinfection																												
	Hyperchlorination (gal/#) (m/d)																												
	Acid(#)																												
	Sodium carbonate (soda ash) (#)																												
	Bicarbonate(#)																												
Maintenance	Flow measurement (gpm)																												
	Press/Vac gauge(psi)																												
	Filter backwash (m/d)																												
	Pool drainage (m/d)																												
	ACC functional/tested monthly (m/d)																												
	SVRS functional/tested monthly (m/d)																												
	Pool Closed																												
Optional	ORP/HRR																												
	Secondary disinfection ☐UV light ☐Copper –silver ☐Ozone																												
	Calcium hardness (ppm)																												
	Bather load																												

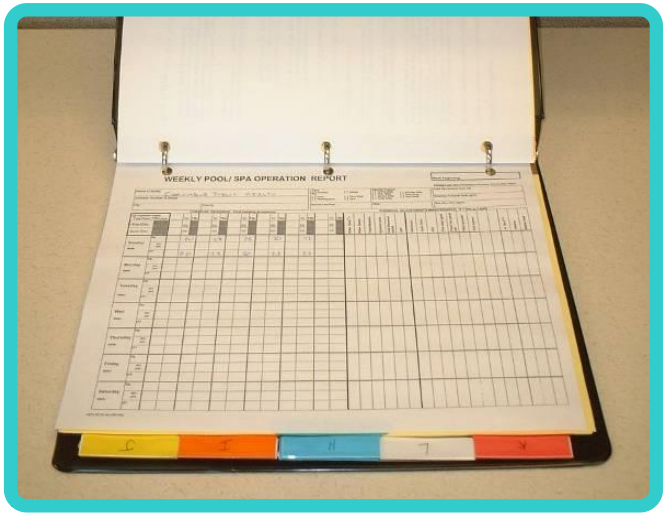
*Monopersulfate interferes with DPD test kit reagents to provide inaccurate results. Monospersulfate is used as a non-chlorine shock to oxidize organic contaminates in the pool

HEA 5219 rev (4/11)

SECTION IV: RECORD KEEPING –

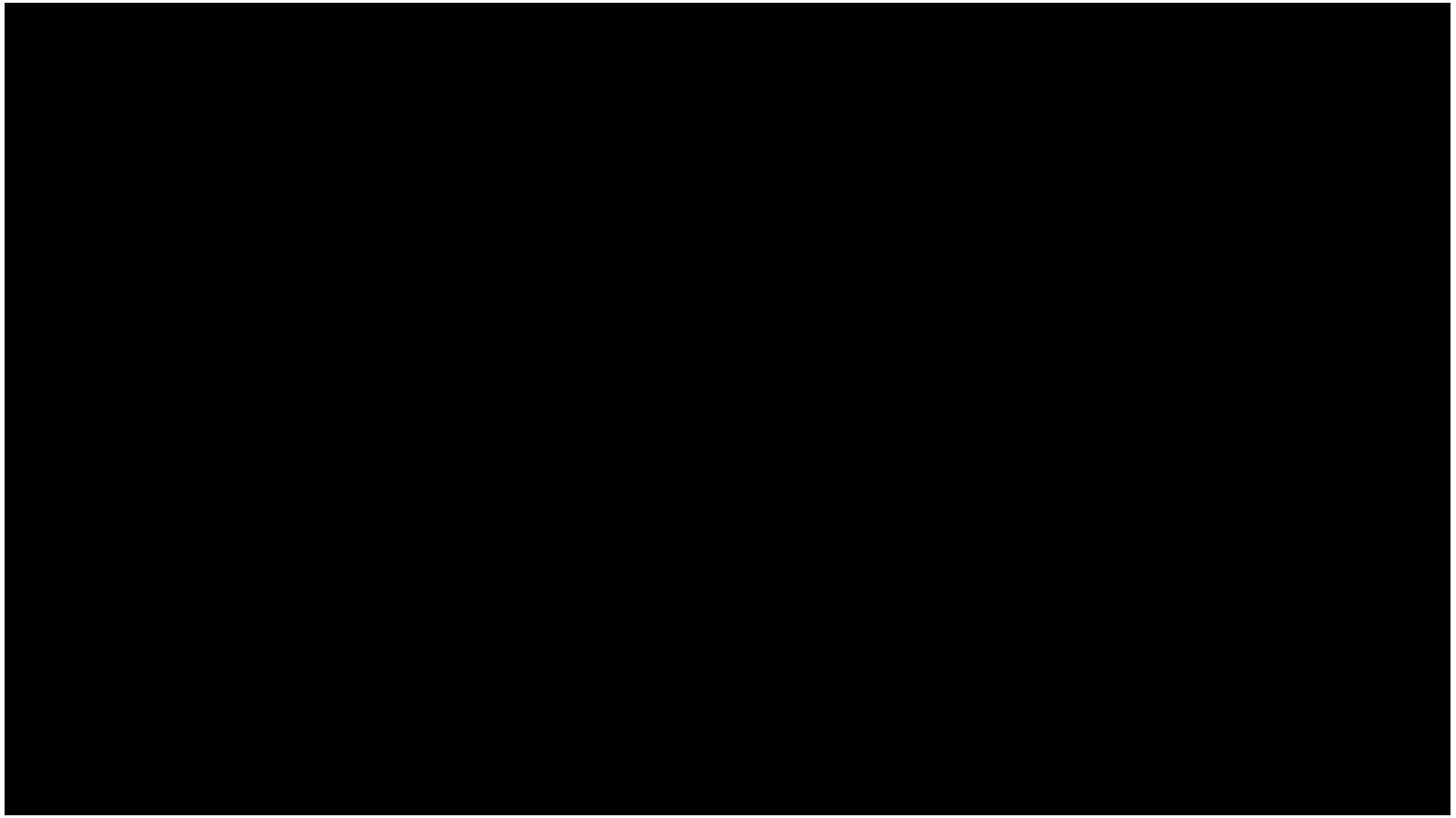
Record Keeping

- Document the following on a daily basis:
  - All injuries and fecal incidents as they happen
  - Temperature
  - Total Alkalinity
- Document the following upon opening & every 4 hours:
  - Free Chlorine
  - Total Chlorine/Bromine
  - Combined Chlorine
  - pH
  - Water Clarity
  - All Chemicals Added
  - Special feature disinfectant and pH



- *Manually test & document at least every 12 hrs. if using an ACC
- Stabilizer (CYA) must be tested & documented at least once a week if used
- SVRS must be tested & documented at least once per month or per manufacturers specs.
- Keep records on site for at least 2 years

Record Keeping Video

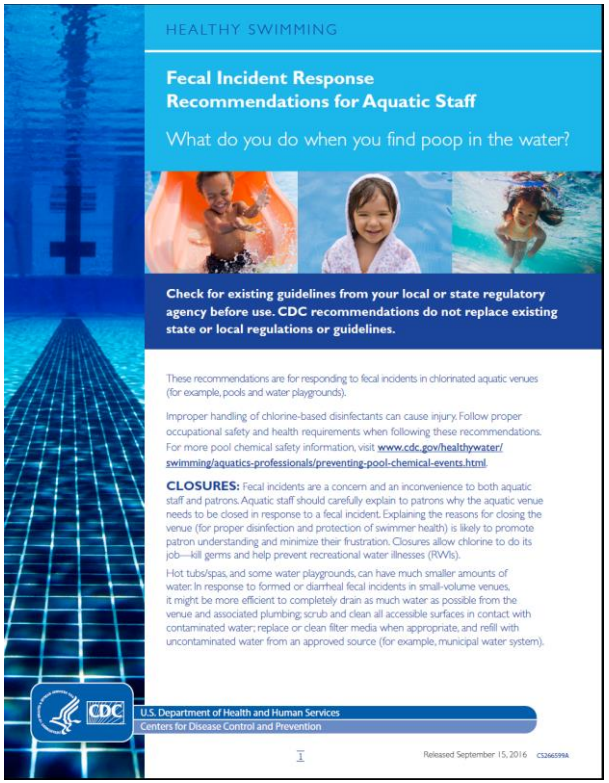


SECTION IV: RECORD KEEPING –

Fecal Incidents

- Close Pool
- Collect as much as possible
  - Bucket or Net
    - Dispose in sanitary manner
    - Clean & disinfect after removal
  - NOT RECOMMENED TO VACUUM
- Reopen
  - **Formed Stool** – Ideal chemistry conditions (rec. 2.0ppm Free Cl)
    - Keep closed for at least **30 mins.**
  - **Diarrhea** – Superchlorinate/Shock (Raise Free Cl to at least 20.0ppm)
    - Keep closed at least **12.75 hrs.**

  ***Disinfection times longer when using Cl Stabilizer (CYA)
- **<u>Document and record incident</u>**



***Further information can be found in the CDC "Fecal Incident Response Recommendations for Pool Staff" guideline

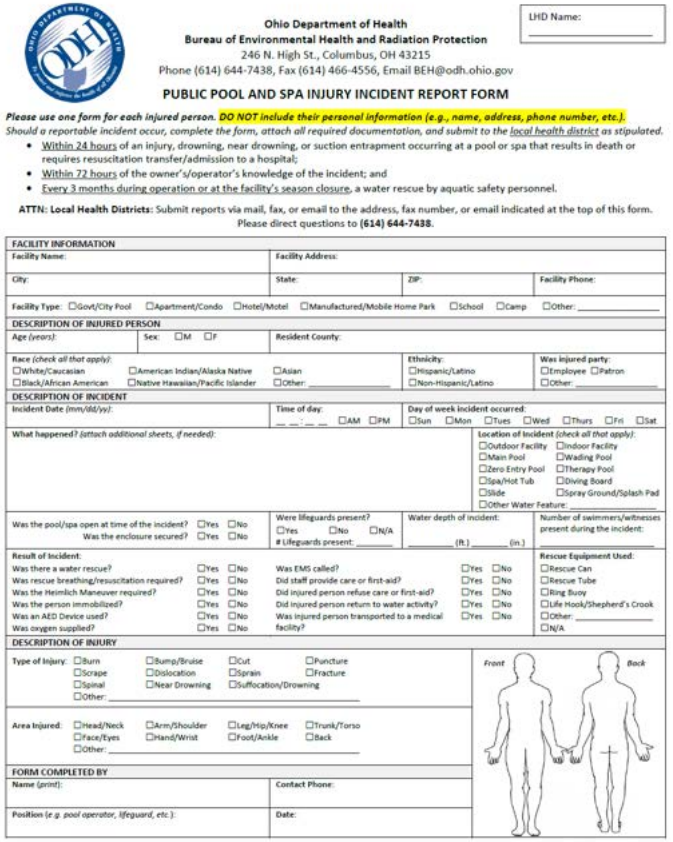
SECTION IV: RECORD KEEPING –

Injuries

- Serious injuries are those that do not require immediate hospital admission but do require medical treatment other than first aid
- The following must be reported to the licensor within 72 hrs of the incident
  - Incidents that resolve in death or serious injury
  - Assistance from EMS
  - Illness involving more than 1 person
  - Drownings & Near Drownings

SECTION IV: RECORD KEEPING – Injuries

Incident reporting forms can be found on the Columbus Public Health Swimming Pool Webpage



Ohio Department of Health
Bureau of Environmental Health and Radiation Protection
246 N. High St., Columbus, OH 43215
Phone (614) 644-7438, Fax (614) 466-4556, Email BEH@odh.ohio.gov

LHD Name: _____

PUBLIC POOL AND SPA INJURY INCIDENT REPORT FORM

Please use one form for each injured person. DO NOT include their personal information (e.g., name, address, phone number, etc.).
Should a reportable incident occur, complete the form, attach all required documentation, and submit to the local health district as stipulated.

- Within 24 hours of an injury, drowning, near drowning, or suction entrapment occurring at a pool or spa that results in death or requires resuscitation transfer/admission to a hospital;
- Within 72 hours of the owner's/operator's knowledge of the incident; and
- Every 3 months during operation or at the facility's season closure, a water rescue by aquatic safety personnel.

ATTN: Local Health Districts: Submit reports via mail, fax, or email to the address, fax number, or email indicated at the top of this form. Please direct questions to **(614) 644-7438**.

FACILITY INFORMATION

Facility Name: | Facility Address: | City: | State: | ZIP: | Facility Phone:

Facility Type: ☐Govt/City Pool ☐Apartment/Condo ☐Hotel/Motel ☐Manufactured/Mobile Home Park ☐School ☐Camp ☐Other: _____

DESCRIPTION OF INJURED PERSON

Age (years): | Sex: ☐M ☐F | Resident County:

Race (check all that apply): ☐White/Caucasian ☐American Indian/Alaska Native ☐Asian ☐Black/African American ☐Native Hawaiian/Pacific Islander ☐Other: _____

Ethnicity: ☐Hispanic/Latino ☐Non-Hispanic/Latino

Was injured party: ☐Employee ☐Patron ☐Other: _____

DESCRIPTION OF INCIDENT

Incident Date (mm/dd/yy): | Time of day: __ __ : __ __ ☐AM ☐PM | Day of week incident occurred: ☐Sun ☐Mon ☐Tues ☐Wed ☐Thurs ☐Fri ☐Sat

What happened? (attach additional sheets, if needed):

Location of Incident (check all that apply): ☐Outdoor Facility ☐Indoor Facility ☐Main Pool ☐Wading Pool ☐Zero Entry Pool ☐Therapy Pool ☐Spa/Hot Tub ☐Diving Board ☐Slide ☐Spray Ground/Splash Pad ☐Other Water Feature: _____

Was the pool/spa open at time of the incident? ☐Yes ☐No
Was the enclosure secured? ☐Yes ☐No

Were lifeguards present? ☐Yes ☐No ☐N/A
Lifeguards present: _____

Water depth of incident: _____ (ft.) _____ (in.)

Number of swimmers/witnesses present during the incident: _____

Result of Incident:
Was there a water rescue? ☐Yes ☐No
Was rescue breathing/resuscitation required? ☐Yes ☐No
Was the Heimlich Maneuver required? ☐Yes ☐No
Was the person immobilized? ☐Yes ☐No
Was an AED Device used? ☐Yes ☐No
Was oxygen supplied? ☐Yes ☐No
Was EMS called? ☐Yes ☐No
Did staff provide care or first-aid? ☐Yes ☐No
Did injured person refuse care or first-aid? ☐Yes ☐No
Did injured person return to water activity? ☐Yes ☐No
Was injured person transported to a medical facility? ☐Yes ☐No

Rescue Equipment Used: ☐Rescue Can ☐Rescue Tube ☐Ring Buoy ☐Life Hook/Shepherd's Crook ☐Other: _____ ☐N/A

DESCRIPTION OF INJURY

Type of Injury: ☐Burn ☐Bump/Bruise ☐Cut ☐Puncture ☐Scrape ☐Dislocation ☐Sprain ☐Fracture ☐Spinal ☐Near Drowning ☐Suffocation/Drowning ☐Other: _____

Area Injured: ☐Head/Neck ☐Arm/Shoulder ☐Leg/Hip/Knee ☐Trunk/Torso ☐Face/Eyes ☐Hand/Wrist ☐Foot/Ankle ☐Back ☐Other: _____

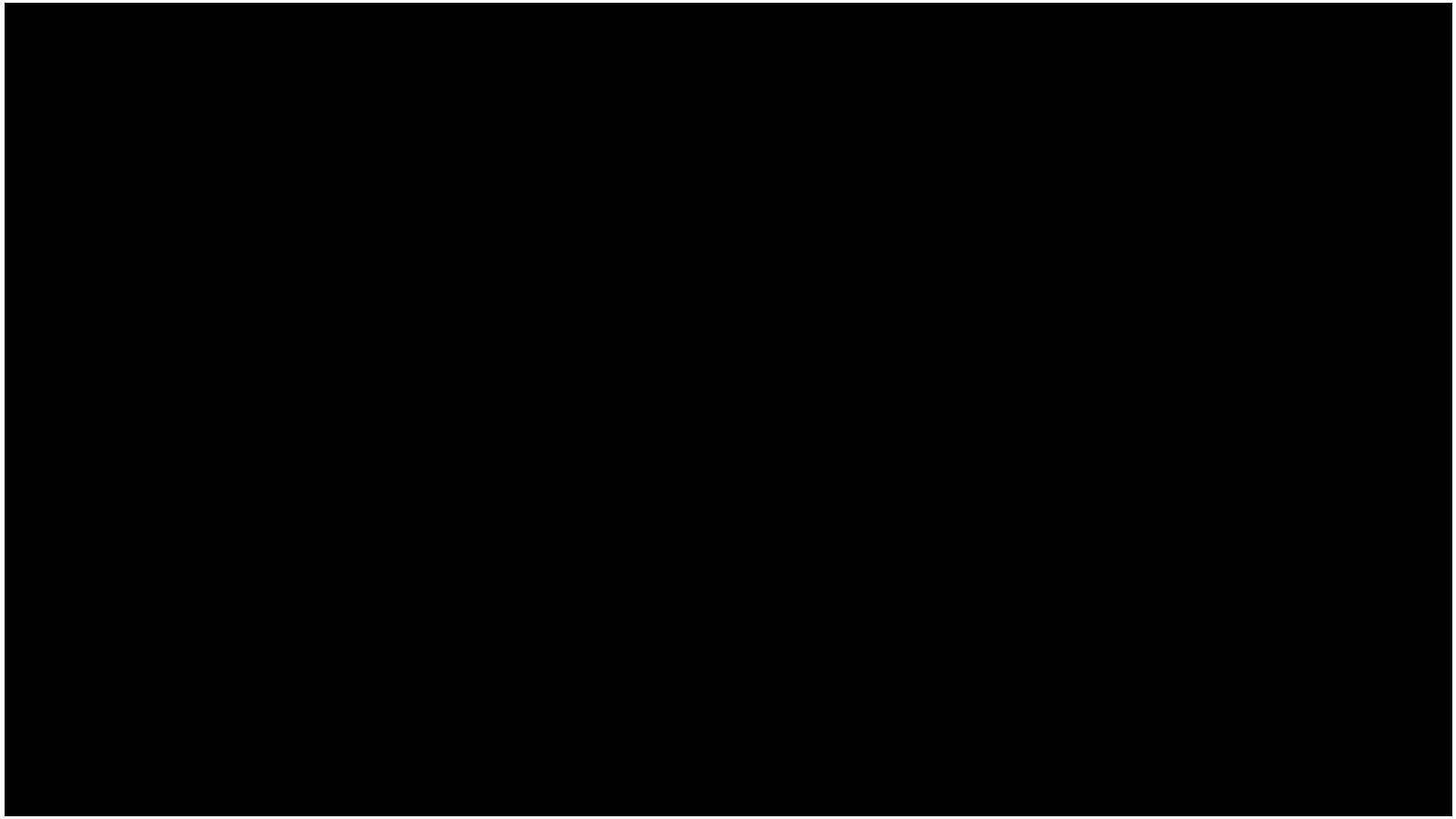
Front Back

FORM COMPLETED BY

Name (print): | Contact Phone:

Position (e.g. pool operator, lifeguard, etc.): | Date:

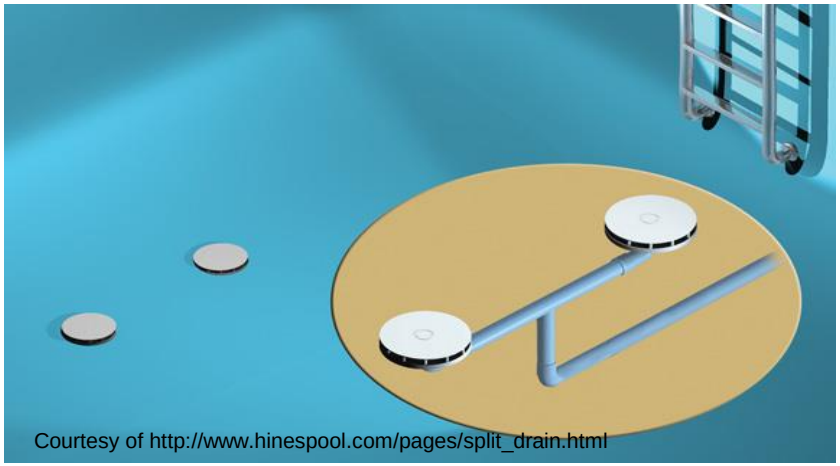
Contamination Video



SECTION V:FACILITY SAFETY

VGB Main Drains

- Must be in the deepest area
- Must be covered by VGB compliant grates that require tools to be removed
- Compliance documentation for each outlet cover must be kept on file with date of installation

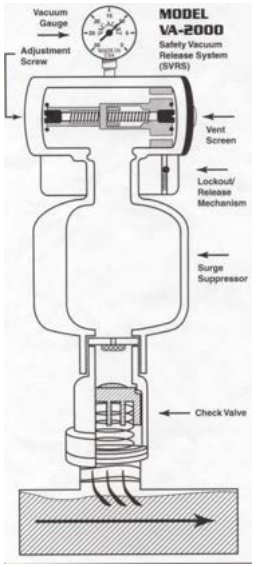


- If pool or spa is on direct suction, and has no Safety Vacuum Release System (SVRS), you must have 2 main drains at least 3 feet apart
  - Unless the drain is considered unblockable (≥18”x23”)
- Main drain must be visible

SECTION V: FACILITY SAFETY –

Safety Vacuum Release System (SVRS)

- Required on pools & spas with or main drain on direct suction
  - Unless drain is considered unblockable (≥18”x23”)
- Senses a blockage on the drain and reduces suction

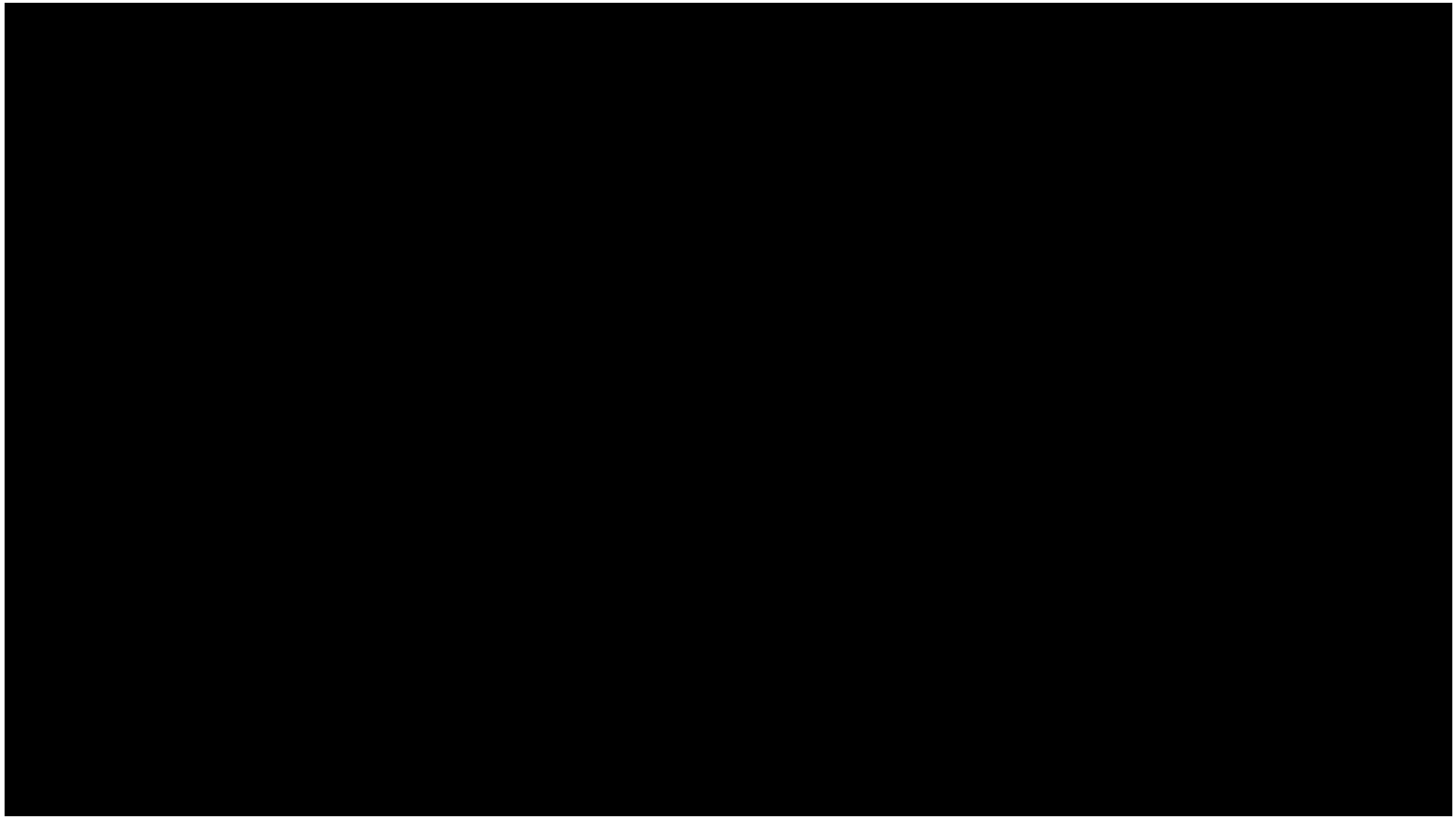


SECTION V: FACILITY SAFETY –

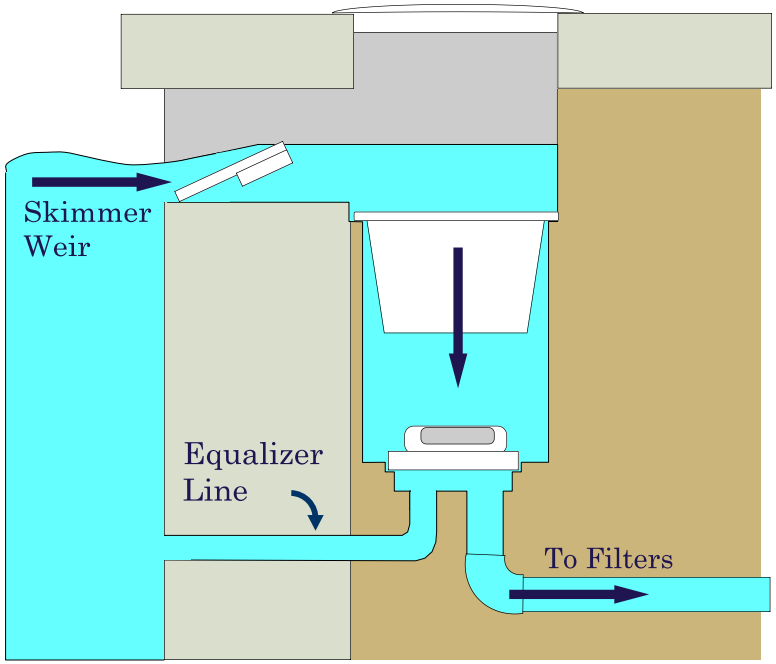
Real Life Situation

https://youtu.be/T3LvBzMOrfo

Suction Outlet Compliance Video



Skimmers

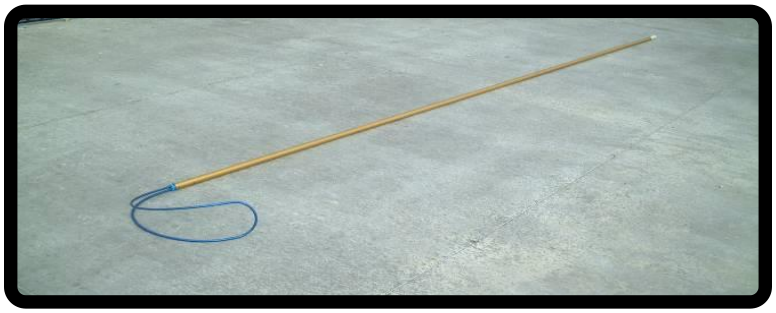


- Skimmers are located in pool wall near the water surface
  - Filter large objects out and into a basket before the water goes to circulation system
- Skimmer weirs are buoyant levers before the skimmer basket
  - Act as one way gates, only allowing water and debris into skimmer, not out to pool
- Equalizer Lines
  - VGB compliant cover, plugged at wall, or removed

Safety Equipment

Spine Boards

- All pools must have at least one
- If lifeguards available, boards need restraints and head immobilizers
- Pools can share board if they share a common fence



Reach Poles

- All pools must have at least one
- Must be at least 12 feet long
- Non-telescopic
- Shepard's crook must be attached

Safety Equipment

Flotation Device

- U.S. Coast Guard approved type IV personal flotation device if facility has no lifeguard
- Rope attached must be ¼ inch in diameter and 30-60 ft long

First Aid Kit

- Must be present at all pools and easily accessible to patrons
- Needs to include new disposable gloves and materials to stop bleeding and clean minor scrapes

SECTION V: FACILITY SAFETY –

Emergency Phone

- Whenever the pool is open, patrons and lifeguards must have access to a working emergency phone
- Phone must be under the control of the operator and capable of directly connecting to emergency services
- Phone should be within 500 feet of each pool or spa
- Emergency numbers and facility address should be posted next to the phone

Lifeguards

Who must have lifeguards?

- Pools with diving boards
- Pools with recreational slides
- Pools with surface areas of 2,000sq.ft. or greater
- Pools with surface areas of less than 2,000sq.ft. and more than 50 people occupying the pool
- Pools with zero depth entry that are more than 18 inches deep
- Uniquely designed pools as required by *OAC 3701-31-04(E)(4)(d)(ii)*

NUMBER OF BATHERS	POOL OR SPA SURFACE AREA (IN SQUARE FEET)					
	1-1,999	2,000-3,999	4,000-5,999	6,000-7,999	8,000-9,999	10,000 or more
1-50	0	1	1	2	2	2
51-150	1	2	2	2-3	3-4	3-4
151 or more	1	2	3	4	4	4-5*

**If the pool or spa has a surface area of 10,000 or more square feet, add one guard for each additional 100 bather or fraction thereof above 250 bathers*

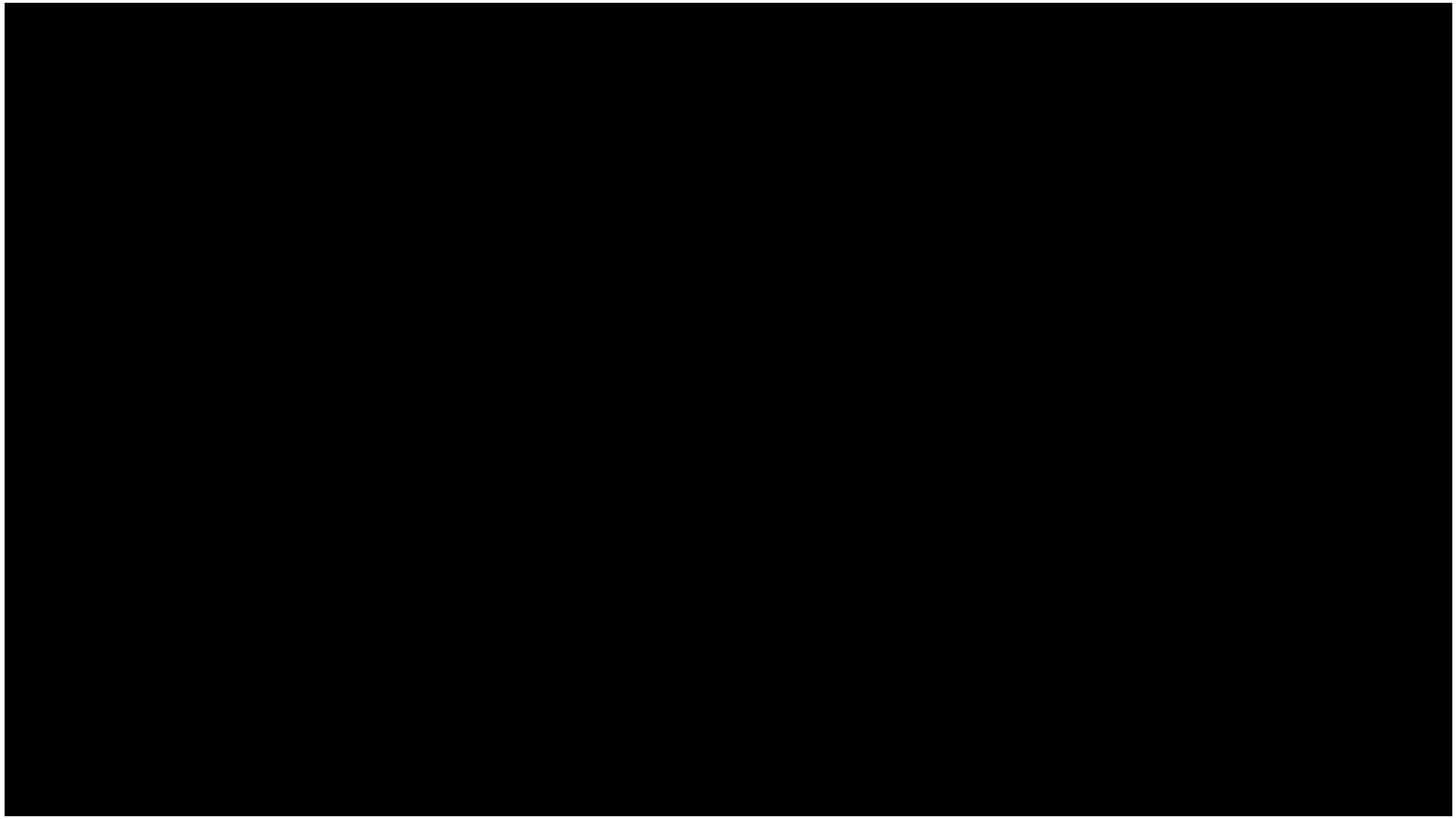
- *See the OAC 3701-31-04(E)(4) for more information on lifeguards*
  - *6000sq.ft. or larger shall have a written plan*

Lifeguards, *Continued*

Lifeguards must…

- Be capable swimmers
- Be certified validly and currently as a lifeguard
- Be certified in CPR
- Be certified in first aid
  - *Pool operator must have copies of lifeguard certifications on file*
- Be prepared to enter the water at any time
- Have a rescue tube and a CPR pocket mask on their person
- Be similarly attired & readily identifiable

Safety and Deck Video



SECTION VI:DESIGN REQUIREMENTS

Fencing

- At least 48 inches high
  (wading pools must have a fence at least 36 inches high)
- No opening greater than 4 inches
- All doors or gates shall be self-closing, self-latching, and lockable
  - The latch should be at least 38 inches above the ground
- All barriers should require a key for entry, and must be locked whenever the pool is closed
- If perimeter barrier is not in compliance the facility shall provide staff that must remain physically present at the pool to prevent unauthorized access or shall not operate
- Access to areas enclosed by the perimeter barrier shall be authorized only when the pool is open (fire pit, grill, etc.)

Fencing

Not Acceptable

Fencing, *Continued*

Controlled access?

No

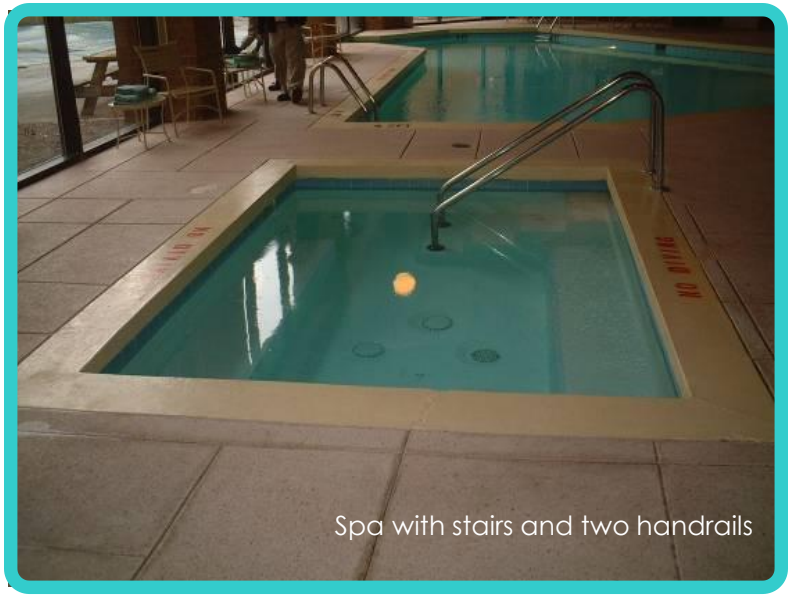
Fencing, *Continued*

What good is a fence if…?

Handrails, Ladders, and Steps

- For safe entry all pools must have either:
  - Safe ladders
  - Recessed steps
  - Stairs with handrails
  - Zero depth entry

- All spas must have at least one handrail



Safety Line

- Lines must be anchored to interior pool wall
- Safety lines must be placed:
  - Depth is greater than 5 feet
  - Where bottom slope changes
    - Line needs to be 1 foot towards the shallow side of the slope change

- May be temporarily removed for lap swimming or other aquatic activities
- Shall be used to visually designate slide splash down areas when the area is open and accessible

Decks

- Decks need to **extend around at least half of the pool perimeter**
- Outdoor decks should be **at least 5 feet wide**
- Indoor decks should be at **least 3 feet wide**

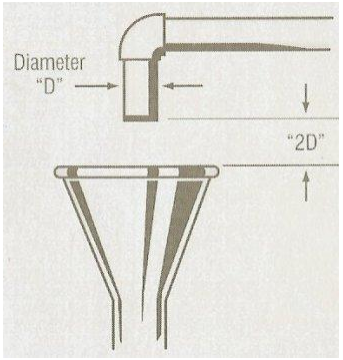
- There should be **no standing water** on decks
- Water collected on decks must **drain to separate drainage system**

SECTION VI: DESIGN REQUIREMENTS –

Backflow Prevention

- Pool water often comes from the same source as drinking water
- To prevent backflow from the pool back to the water supply, one of the following backflow methods must be used:

Air Gap

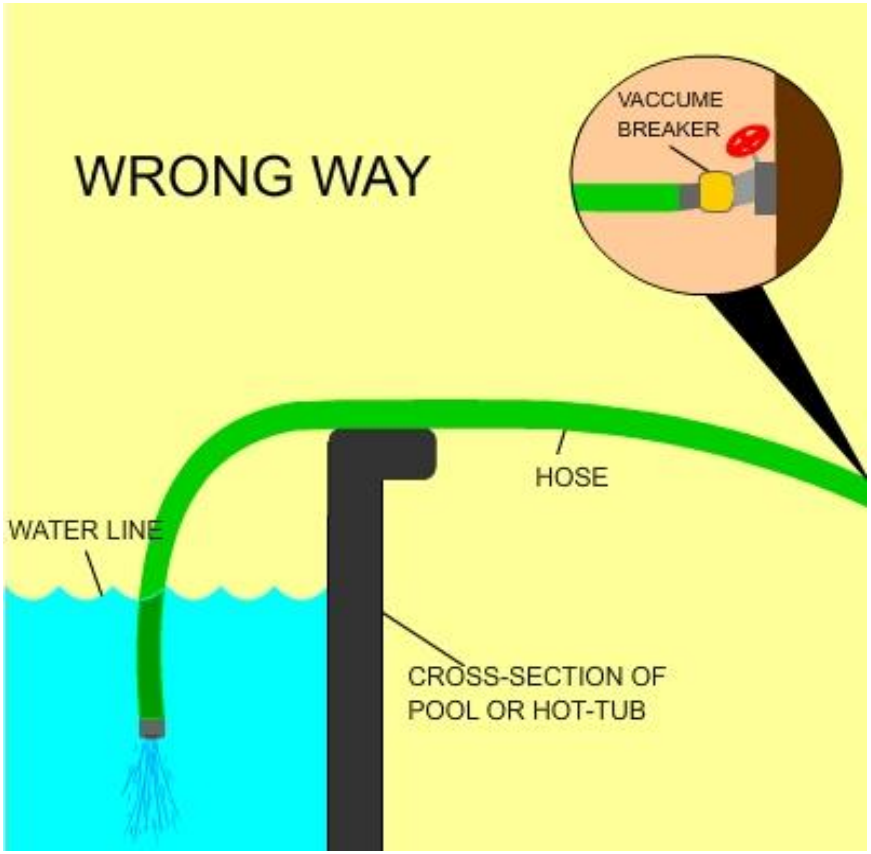


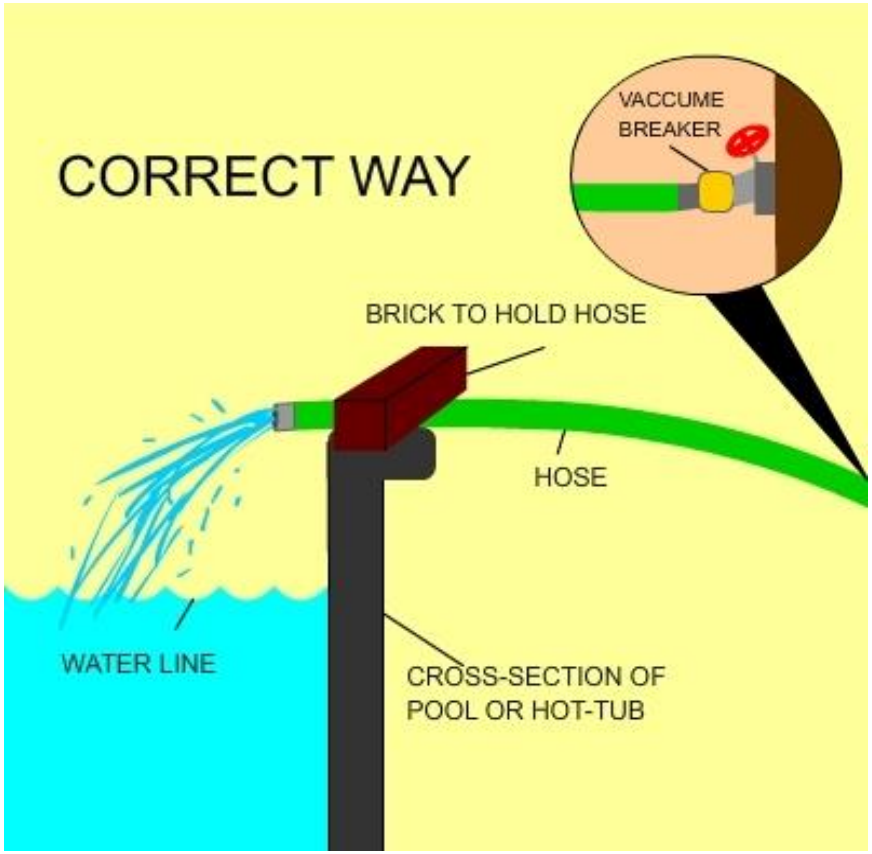
ASSE 1013

ASSE 1011

ASSE 1019

Backflow Prevention, *Continued*





Courtesy of http://www.springhilltn.org/backflow.htm

SECTION VII: SIGNAGE

Deck Signage

Depth Markings and "No Diving" Signs

- **At least 4 inches high** and in contrast to the background
  - "No Diving" graphic can be used in place of the words "No Diving"
- Markings must be **within 2 feet of waters edge** or six inches of the gutter
- Depth markings and "No Diving" signs should be **next to one another**

SECTION VII: SIGNAGE –

Deck Signage, *Continued*

- There is to be **at least two depth markings per spa or wading pool**
- Signage must be **no more than 25 feet apart** at all pools
- Deck signage must be **slip resistant**
- “No Diving” signs are not required for wading pools or spas
- “No Diving” signs are not needed in pool areas with depths of more than 5 feet

SECTION VII: SIGNAGE –

Safety Signage

- If no lifeguard is required, you must post a sign(s) stating:
  - ***"Warning /Danger, No Lifeguard"***
  - ***"Swimming alone is not recommended"***
  - ***"Children must be supervised"***

- Must also post a **sign stating the location of the nearest telephone**, if phone cannot be seen
- At emergency phone, **post emergency contact phone numbers and facility address**
- Any time pool or spa is closed **post**
  - **"DANGER – POOL (OR SPA) CLOSED"**
    or
  - **"WARNING – POOL (OR SPA) CLOSED"**

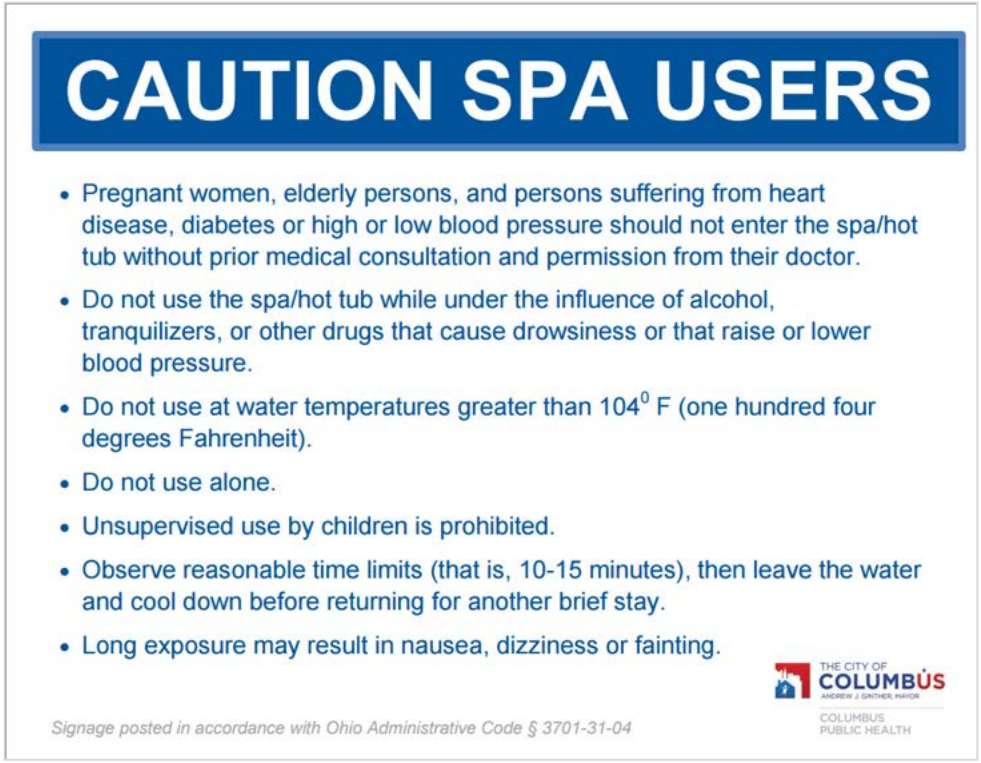
Safety Signage

- This telephone signage is **not** acceptable!

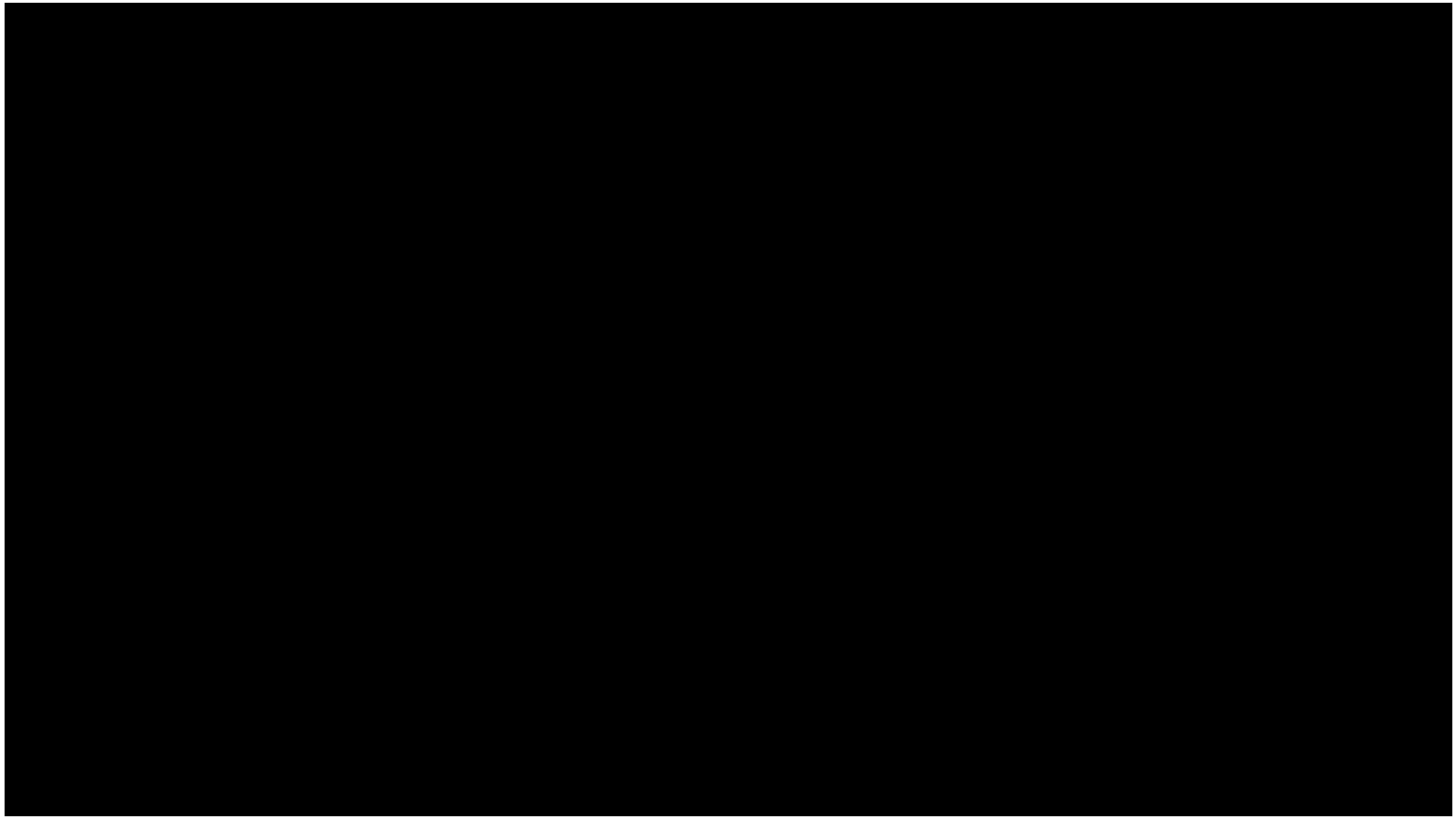
SECTION VII: SIGNAGE –

Spa Signage

- Due to the special risks presented by the high water temperature, spas need special signage



Spa Video



SECTION VIII: SPRAY GROUNDS

SECTION VIII: SPRAY GROUNDS-

What is a spray ground?

- A special use public swimming pool for bathing and/or interactions with fountains, sprays, jets, and other special features designed without standing water when the fountains are turned off so that users have full body exposure with circulated water.

Special Spray Ground Requirements

- Circulations system must operate continuously, 24 hours a day, during all parts of year the spray ground is in use.
- An automatic controller is required for all spray grounds

SECTION VIII: SPRAY GROUNDS-

Special Spray Ground Requirements

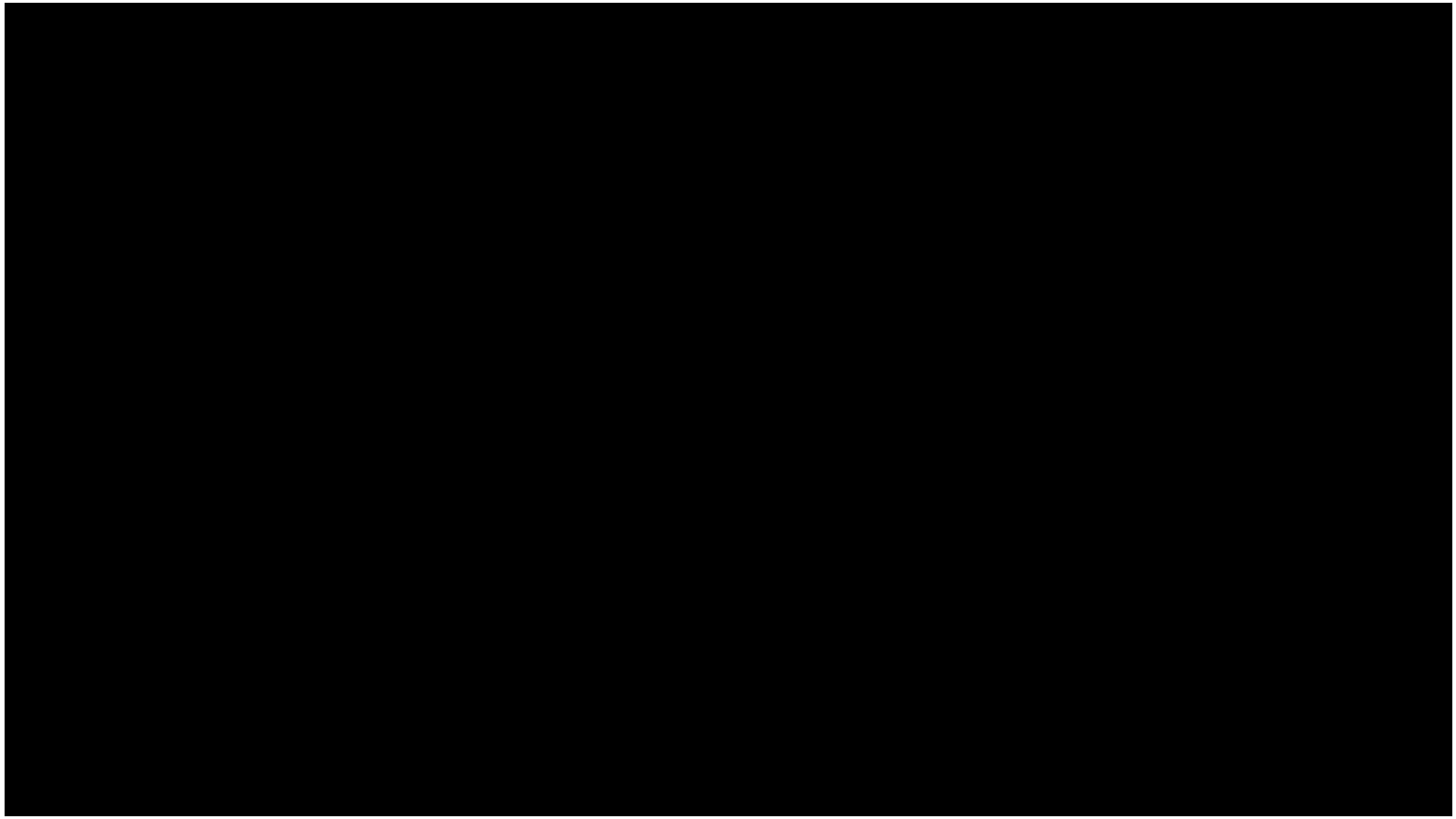
- Turnover rate, with in the mixing holding tank, must meet a full system turnover at least once every 30 min.
- Surface must be slip and trip resistant
- All water should properly drain to ensure no standing water is present above the level of the outlet.

SECTION VIII: SPRAY GROUNDS-

Required Spray Ground Signage

- Do not use spray ground when you have diarrhea
- Water is not meant for drinking
- Wash hands after using the restroom or changing diapers
- Take regular restroom breaks, change diapers only in a restroom
- Any additional recommendations provided by manufacturer

Spray Ground Video



SECTION XI: RENOVATIONS

Plan Review and Equipment Replacement

Plan Review

- **New Construction**
- **Substantial Alteration** - Changes that exceed simple equipment changes. Plans must be submitted to ODH
  - Change in the basic design (depth, shape, circulation system design)
  - Add special feature
  - Deck (slope, surface finish, basic design)
  - Perimeter barrier (design, height, configuration, routes of access)
  - Replacement of the circulation system
  - New/relocated dive stand or change in design
  - Pipe replacement (All to or from pool)
  - Overflow system replacement

***Questionable situations call ODH Engineering (614)644-7527**

Plan Review and Equipment Replacement, *Continued*

Equipment Replacement

- Replacing old equipment with a newer, different type of equipment or disinfectant change
  - "Equipment Replacement Notification Report"
- Replacing an older device for a newer version of the exact same model
  - No report needs to be submitted
    - Specifications are identical

SECTION X: CITY OF COLUMBUS CLOSURE & ENFORCEMENT PROCEDURES

SECTION X: CITY OF COLUMBUS CLOSURE & ENFORCEMENT PROCEDURES –

Immediate Closure

- **Columbus City Health Code (Mirrors OAC)**
  - The water clarity and/or lighting is not sufficient to see the main drain.
  - The main drain cover is not secure, is missing, or is improperly installed
  - The disinfectant level is less than required minimum
  - The disinfection/circulation system is not operating properly
  - No lifeguard is on duty when required
  - SVRS not functioning
  - An automatic chemical controller is not provided or functioning when required
  - A fecal incident has not been properly treated
  - A recreational water illness linked to the facility has not been properly treated
  - Improper or unauthorized use or storage of chemicals
  - An electrical hazard exists

Immediate Closure, *Continued*

- Operator needs to close the pool until the imminent health hazard is corrected
- Found during an inspection by CPH & operator has **not** taken action
  - Pool will be closed and a red sign issued
- Further items may be covered under

  OAC §3701-31-04(B)(1)

Enforcement Procedures

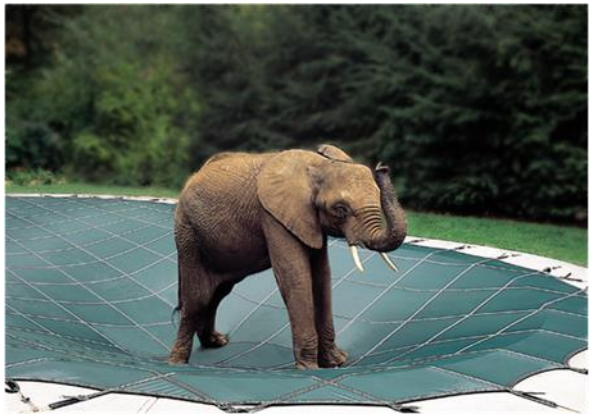
- All critical violations that cannot be corrected at time of inspection will incur a two week follow-up to ensure compliance
- Facilities with chronic violations, critical or non-critical, and pools with chronic immediate closures are subject to enforcement procedures

Enforcement Procedures

- Consequences of Enforcement Procedures:
  - Green ‘Inspected’ sign removed and replaced with yellow sign
  - Administrative conference held at Columbus Public Health between program and facility management
  - Required written Plan of Action to outline steps to correct all outstanding violations
  - Education requirements for all staff tending to pool
  - Increased inspection frequency for at least 30 days
  - Possible Board of Health action should issues persist

Winter Closure Procedures

- “WARNING (or) DANGER Pool (or) Spa Closed Sign posted
- Fence maintained in good repair
  - No gaps greater than 4 inches
- Maintain cover, if utilizing



Winter Closure Procedures, *Continued*

Damaged Pool Wall

Winter Closure Procedures, *Continued*

Where the POOL has a BARRIER enclosing it:

1) The water shall be recirculated and treated to meet the criteria of the CODE; or
2) The water shall be drained; or
3) An approved SAFETY cover that is CERTIFIED, LISTED, AND LABELED to ASTM F1346-91 by an ANSI-accredited certification organization shall be installed; or
4) Where a safety cover is not used or not practical, access to the POOL shall be restricted and routine checks of the integrity of the BARRIER shall be made.

Winter Closure Procedures, *Continued*

Where the POOL does not have a BARRIER enclosing it and other parts of the AQUATIC FACILITY are open to the public:

1) The water shall be recirculated and treated to meet the criteria of the CODE and the POOL shall be staffed to keep BATHERS out; or
2) The water shall be drained, and the POOL shall be staffed to keep BATHERS out; or
3) A temporary BARRIER enclosing the POOL shall be installed to keep bathers out, and routine checks of the integrity of the temporary BARRIER shall be made; or
4) An approved SAFETY cover that is CERTIFIED, LISTED, AND LABELED to ASTM F1346-91 by an ANSI-accredited certification organization shall be installed.

Winter Closure Procedures, *Continued*

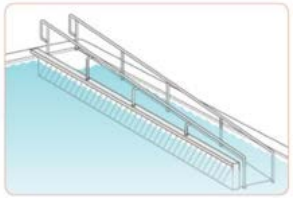
- If you do not wish to open your pool for the season, you must…
  - Keep pool closed in accordance with one of the closure methods
  - Pay for license
    - If kept unlicensed for one year then pool will have to go through plan review through ODH

ADA Compliance

www.ada.gov or 1-800-514-0301

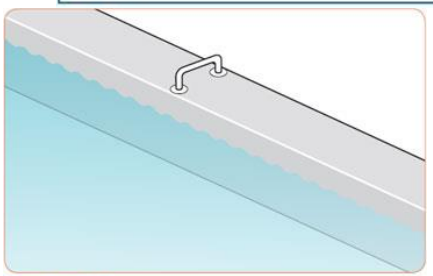
- Americans with Disabilities Act (ADA)
  - Department of Justice
- Different categories, such as
  - Title II (Public)
  - Title III (Private)
- Compliance date of

  January 31, 2013

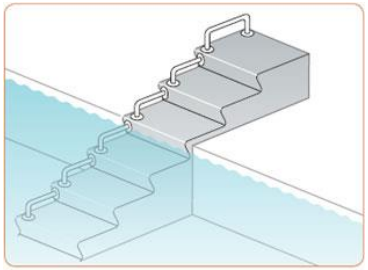


Permitted Means of Pool Access

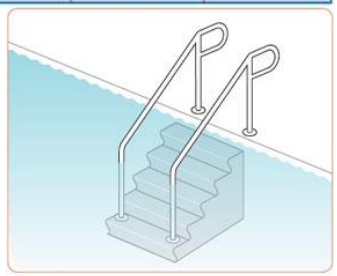
Application Type	Primary/Secondary		Secondary		
Means of Access	Pool Lift	Sloped Entry	Transfer Wall	Transfer System	Stairs
Swimming Pool <300 Linear Feet (1 means of access required)	X	X			
Swimming Pool >300 Linear Feet (2 means of access required - 1 must be a primary means)	X	X	X	X	X
Wave action, lazy river, and other pools where user entry is limited to one area	X	X		X	
Wading Pools		X			
Spas	X		X	X	



Transfer Wall



Transfer System



Pool Stairs

What can you do?

- Educate yourself
  - **Ohio Administrative Code Chapter 3701-31-04 (B)(3)**
    - *Knowledgeable of equipment and pool operation*
  - **Read the Rules!**
- Educate your clientele with posters or brochures
- Promote healthy swimming practices
  - No swimming when sick
  - Showering before swimming and hand washing
- Maintain a healthy pool environment

Take the Pledge!

- Pool Safely is a national campaign aiming to reduce childhood drownings and entrapments
- Columbus Public Health has partnered with the campaign to provide educational materials to pools in Columbus
- Resources, videos, and games available on the campaign website

https://www.poolsafely.gov/

Further Educational Opportunities

- Certified Pool/Spa Operator® Certification (CPO®)
  - Pool & Hot Tub Alliance (PHTA)
    - Formerly the National Swimming Pool Foundation (NSPF®)
- Online “Pool & Spa Safety” Class
- Both Offered at Columbus Public Health

Credits

Course Content and Development
Adam Holbrook, RS, REHS, NSPFI

Videography
Alex Brown, CTV Columbus

Course Editing and Content
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Elizabeth Ousky, RS, CPO
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Jeff Lyons, RS, CPO
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Administration
Keith Krinn, RS, MA, DAAS, CPHA
Luke Jacobs, MPH, RS/REHS, CPO
John Richter, RS, CPO

Funding
Association of Pool and Spa Professionals (APSP)

Thank You to Our Facilities who Participated in the Videos

- City of Columbus Recreation & Parks
- Trillium Crossing
- Fairfield Inn & Suites by the Airport
- Ohio State School for the Blind
- Wesley Glen
- The District at Linworth
- Swiminc Worthington
- The Woods at Perry Lane
- Prairie Twp. Comm. Ctr.
- The District at Tuttle
- Premier at Sawmill Ath. Club
- Worthington Comm. Ctr.
- Worthinglen
- McNeill Farms
- Silver Tree at Little Turtle
- Hudson Square
- Albany Landing

Links

publichealth.columbus.gov
www.odh.ohio.gov
www.cdc.gov
www.ada.gov
www.apsp.org
www.redcross.org
www.nsf.gov
osha.gov
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www.astm.org
www.ul.com
www.nspf.org

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