



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
CAMPGROUNDS & POOLS UNIT
WATER BUREAU**



**DISCUSSION OF THE VIRGINIA GRAEME BAKER POOL & SPA SAFETY ACT OF 2007
REQUIRING ANTI-ENTRAPMENT DRAIN COVERS
FOR PUBLIC SWIMMING POOLS IN MICHIGAN**

This document is intended to discuss swimming pool main drain suction entrapment avoidance and our understanding of the requirements and effects of the Virginia Graeme Baker Pool & Spa Safety Act of 2007 (VGB Act) on public swimming pools in Michigan.

- What are the safety issues related to pool main drains and other suction outlets?

Over many years there have been several documented cases of people being trapped by the suction from swimming pool main drains and other suction fittings. The U.S. Consumer Products Safety Commission (CPSC) reports that there were 15 injuries and two fatalities in the U.S. from 2002 to 2004 due to suction entrapment. There are five entrapment hazards associated with suction outlets. Any of these types of entrapment can cause serious injury or death:

- A person's body can become entrapped and held down by the suction power of a pool pump.
 - A person's limbs can become lodged and entrapped in open suction piping.
 - A person's hair can be caught and/or entangled.
 - A person can also be disemboweled or eviscerated.
 - A person's clothing or jewelry can also be caught in drain covers.
- What is the Virginia Graeme Baker Pool & Spa Safety Act of 2007?

The VGB Act promotes the safe use of pools, spas, and hot tubs by imposing mandatory federal requirements for suction entrapment avoidance. The VGB Act went into effect on December 19, 2007 and is being administered by the U.S. Consumer Products Safety Commission (CPSC).

- What are some ways to prevent suction entrapment?

There are at least four common ways to reduce the risk of entrapment on a swimming pool main drain:

- Provide more than one drain. If a person blocks one drain, a second open drain is available to keep suction power down and prevent the entrapment.
- Provide a slow water velocity through the drain cover. Larger drain covers lower the water velocity through the cover, resulting in less suction power available to entrap a person. Lower velocity also reduces hair entrapment possibilities.
- Provide a slower water velocity in the piping between the drains and to the pump suction. Larger pipe sizes lower the water velocity to develop less suction power to entrap a person.
- Ensure that all suction covers are not broken or damaged in any way and that covers are held securely in place.

- Our public swimming pool has two main drains. Does our pool have these common ways to reduce entrapment risk?

YES. Michigan public swimming pool rules require all these common anti-entrapment protections. Since 1971, Rule 42 has required at least two main drains that are three feet apart. This rule also required a slow inlet velocity of two feet per second through the drain covers. This was changed to an even slower velocity of one foot per second in 2001. The industry standard maximum velocity through a suction cover is 1.5 feet per second. Rule 37 requires all suction piping to have a flow velocity of five feet per second or less. The industry standard is six feet per second. Michigan rules also require that suction covers are removable only with tools, and that all components of the pool be kept in good repair.

- Has there ever been a suction entrapment injury or death in a public swimming pool in Michigan?

Not that we are aware of. We believe that our long-standing main drain safety rule has prevented injuries and deaths. However, it is possible that a drowning at a public swimming pool could have been due to a suction entrapment, but the emergency responders did not report the drowning as a suction entrapment. With increased public awareness to the problem of suction entrapment, emergency responders now report when the cause of a drowning or near-drowning is related to a suction entrapment.

- If the Michigan public swimming pool rules provide these levels of anti-entrapment protection for our public swimming pools, what brings up issues with main drains now?

Michigan has had a higher level of suction entrapment avoidance protection for public swimming pools than many other areas of the country. In June 2007, a 6-year old girl was disemboweled on the single main drain of a public wading pool in another state. She died as a result of her injuries earlier this year.

The VGB Act was actually introduced in Congress several years ago. Only after this most recent tragedy did Congress act.

- We have heard of other ways of reducing the risk of suction entrapment. What are they?

Other mechanical ways of reducing the risk of entrapment include:

- **Safety vacuum release systems are devices that can be installed after a pool is constructed. These are installed on the pump suction piping and quickly introduce air into the piping when an increase in suction is sensed. The air effectively breaks the suction of the pump.**
- **An automatic pump shut-off device can be installed after a pool is constructed. These devices simply turn the pump off when an increase in suction is sensed.**
- **A gravity drainage system is installed during the original construction of a pool. The drains of the pool are not connected directly to any pump. The drains flow by gravity to a collector or balance tank and the pump suction draws water from the tank without being directly connected to the drains. If a drain is blocked, the pump simply draws water from the tank preventing entrapment.**

- **A suction limiting vent system is installed during the original construction of the pool. A pipe or vent line is connected near the main drains with the other end open to the atmosphere. If a drain is blocked, water and then air will be drawn through the vent pipe preventing entrapment**

Note: The following discussion is the Department of Environmental Quality (DEQ) opinion and understanding of provisions of the federal VGB Act. The discussion opinions that follow have not been reviewed by the CPSC and are subject to change without notice. The CPSC has sole authority to interpret and enforce the provisions of the VGB Act.

- What do the mandatory provisions of the VGB Act require?

By December 19, 2008, the VGB Act requires:

- **All suction outlet fittings and covers made, imported, or sold in the U.S. must be certified to comply with the ASME/ANSI A112.19.8-2007 (A112-2007) standard.**
 - **All existing and new public pools in the U.S. shall be equipped with drain covers certified to comply with the A112-2007 standard.**
 - **All existing and new public pools that have a single main drain other than an unblockable drain shall employ one or more of the following additional options:**
 - **Safety vacuum release system**
 - **Suction limiting vent system**
 - **Gravity drainage system**
 - **Automatic pump shut-off**
 - **Drain disablement**
 - **Equivalent system approved by the CPSC**
- Still, what is the problem?

The VGB Act is effective nationwide. Some states do not have anti-entrapment provisions for suction outlets in their rules. Other states have only recently enacted them. The VGB Act requires that all public swimming pools comply with the anti-entrapment provisions of the Act within ONE YEAR. The VGB Act requires drain covers certified to the A112-2007 standard. The VGB Act applies to ALL public swimming pools in Michigan under the federal preemption clause.

- What is a certified drain cover?

According to the VGB Act: “. . .each public pool and spa in the United States shall be equipped with anti-entrapment devices or systems that comply with the ASME/ANSI A112.19.8 performance standard, or any successor standard.”

- What is the A112-2007 standard?

This is a voluntary national standard that was first developed in 1987 under the guidance of the American Society of Mechanical Engineers to certify that suction drain covers meet established anti-entrapment protocols. This standard was reaffirmed in 1996. This standard applied to all drain covers, but was more frequently

applied to round drain covers and covers up to 9 inches by 9 inches in size. The standard formerly dictated the size and volume of the testing tank, which limited the testing size to 12 inches by 12 inches. This standard was revised in 2007. The scope of this standard now applies to drain covers somewhat larger than 18 inches by 18 inches.

The A112-2007 standard requires that a certified drain cover be embossed with an acceptable marking indicating certification to A112-2007. The marking must be visible when the cover is installed. If there is no marking or the marking does not indicate 2007, then the cover is not acceptable.

- Still, how does this affect our existing public pool?

Since the VGB Act calls for all public pools to have drain covers certified to A112-2007, this means that NO suction outlet covers on existing pools technically comply. Most existing covers comply with previous versions of A112, but not necessarily with the 2007 revision.

- What do we do to comply with the VGB Act? What covers comply? Where can I obtain them?

These are difficult questions to answer now. As of July 2008, there are very few covers that comply with A112-2007. The DEQ has been advised that more covers will come on the market in the next six months that comply with A112-2007. In the absence of certified drain covers, the CPSC is now working on details to advise the states in how to proceed. In the meantime, since Michigan pool rules have a high level of safety, we will continue to apply our existing Rule 42 through December 19, 2008. Two or more main drains with slow velocities through the covers remains our main enforceable criteria for evaluating new and existing drains. We will also place a condition on new construction permits that require certified drain covers after December 19, 2008.

- How can I tell if a cover is certified to A112-2007?

Certified drain covers are required to be stamped with the ASME/ANSI A112.19.8-2007 marking and the maximum certified flow rate that is visible when the cover is installed. If the ASME marking is on the underside of the cover, then the cover is not certified to A112-2007.

- If I change to covers that meet A112-2007, then I comply?

Not necessarily. There is a conflict with Michigan's Rule 42 and A112-2007. Some drain covers that meet A112-2007 could have a maximum certified flow rating far in excess of the flow velocity allowed by Rule 42. The DEQ is aware of at least one A112-2007 certified drain cover that is marked for five times the flow rate allowed by the Michigan rule.

For this reason, we have not included A112 certification for drain covers in the Michigan rules. In the past, we have actually required larger drain covers than A112. Now, the VGB Act requires A112 compliant drains, so the conflict with Michigan rules will be made larger with a push toward compromising our slower flow velocity requirements.

- What if we have recently changed our drain covers or have broken, loose, or missing drain covers?

If you have changed or replaced drain covers to repair a broken, loose, or missing cover this is very good. Newer drain covers probably comply with a previous version of A112. Even though there may be a flow velocity conflict with Rule 42, an intact drain cover is always better than having a broken, loose, or missing drain cover.

No pool should ever be operated under any circumstances with any broken, loose, or missing suction drain covers. If your pool has broken, loose, or missing suction drain covers you must immediately clear the pool of all swimmers, turn off all pool pumps, and keep the pool closed until certified drain covers are provided and securely fastened. Again, any intact drain cover is always better than a missing or broken cover.

- Are we allowed to add other anti-entrapment devices to supplement our existing main drains?

YES. You may at any time install a SVRS. We simply need to have the make, model number, and installation diagram for the device. Other anti-entrapment systems such as atmospheric vents, collector tanks, or enlarged main drains can be approved by a construction permit. Please note that none of these other anti-entrapment devices will relieve the federal requirement for replacing drain covers.

- What other sources of information are available?

The VGB Act is available online at <http://www.cpsc.gov/pssa.pdf>. Also available online is the “June 18, 2008 Staff Interpretation of Section 1404: Federal Swimming Pool and Spa Drain Cover Standard” at <http://www.cpsc.gov/phth/vqpsa.pdf>.

Also the Association of Pool & Spa Professionals website www.apsp.org provides more detailed information about the VGB Act and their comprehensive ANSI/APSP-7 standard for Suction Entrapment Avoidance.

NOTE: The information in this document is intended to supplement the public swimming pool portions of the Public Health Code, 1978 PA 368, as amended, and the Public Swimming Pool Rules. These comments do not replace or supersede any portion of the Act and Rules. To download a copy of the Public Swimming Pool Act and Rules, please go to www.michigan.gov/deqwb.