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| <b>Mandatory Measures Summary</b>                          |                                     | <b>MF-1R</b>         |
| <i>Pool and Spa Heating Systems and Equipment Measures</i> |                                     | <b>(Page 1 of 1)</b> |
| Site Address:  | Enforcement Agency: City of Ontario | Date:                |

**2008 BUILDING ENERGY EFFICIENCY STANDARDS (effective 1/1/2010).**

**MANDATORY REQUIREMENTS FOR POOL AND SPA SYSTEMS AND EQUIPMENT:**

- § 114(a): Any pool or spa heating system shall be certified to have: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater; a permanent weatherproof plate or card with operating instructions; and shall not use electric resistance heating or a pilot light.
- § 114(b)1: Any pool or spa heating equipment shall be installed with at least 36" of pipe between filter and heater, or dedicated suction and return lines, or built-up connections for future solar heating
- § 114(b)2: Outdoor pools or spas that have a heat pump or gas heater shall have a cover.
- § 114(b)3: Pools shall have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.
- § 150(p): Residential pool systems or equipment meet the pump sizing, flow rate, piping, filters, and valve requirements:
- 1. Pump sizing and flow rate.**
    - a. All pumps and pump motors installed shall be listed in the Commission's directory of certified equipment and shall comply with the Appliance Efficiency Regulations.
    - b. All pump flow rates shall be calculated using the following system equation:  

$$H = C \times F_2$$

Where: H is the total system head in feet of water.  
F is the flow rate in gallons per minute (gpm).  
C is a coefficient based on the volume of the pool:  
0.0167 for pools less than or equal to 17,000 gallons.  
0.0082 for pools greater than 17,000 gallons; and
    - c. Filtration pumps shall be sized, or if programmable, shall be programmed, so that the filtration flow rate is not greater than the rate needed to turn over the pool water volume in 6 hours or 36 gpm, whichever is greater; and
    - d. Pump motors used for filtration with a capacity of 1 hp or more shall be multi-speed; and
    - e. Each auxiliary pool load shall be served by either separate pumps or the system shall be served by a multi-speed pump; and  
**EXCEPTION to Section 150(p)1E:** Pumps if less than 1 hp may be single speed.
    - f. Multi-speed pumps shall have controls which default to the filtration flow rate when no auxiliary pool loads are operating; and
    - g. For multi-speed pumps, the controls shall default to the filtration flow rate setting within 24 hours and shall have an override capability for servicing.
  - 2. System piping.**
    - a. A length of straight pipe that is greater than or equal to at least 4 pipe diameters shall be installed before the pump; and
    - b. Pool piping shall be sized so that the velocity of the water at maximum flow for auxiliary pool loads does not exceed 8 feet per second in the return line and 6 feet per second in the suction line; and
    - c. All elbows shall be sweep elbows or elbow-type that have a pressure drop of less than the pressure drop of straight pipe with a length of 30 pipe diameters.
  - 3. Filters.** Filters shall be at least the size specified in NSF/ANSI 50 for public pool intended applications.
  - 4. Valves.** Minimum diameter of backwash valves shall be 2 inches or the diameter of the return pipe, whichever is greater.