**West Virginia Code**

| **Table 64-16 C - Water Quality Guidelines****Table 64-16 C - Water Quality Guidelines** |
| --- |
| **A. Disinfectant****Levels** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Free chlorine****mg/l (ppm)** | **1.0** | **2.0 -3.0** | **5.0** | **Chlorine should be maintained at this level continuously. Super-chlorinate regularly. See B-1 below.** |
| **2. Combined****chlorine****mg/l (ppm)** | **None** | **None** | **0.5** | **Eliminated by super-chlorination.****If too high, you may have:****Sharp chlorinous odors****Eye burn****Algae growth****Bacteria growth** |
| **3. Bromine****mg/l (ppm)** | **2.0** | **2.0-3.0** | **5.0** | **Consult health dept. officials before use.** |
| **B. Chemical****Values** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. pH** | **7.2** | **7.5** | **7.8** | **TOO HIGH****Low chlorine efficiency Scale formation****Increased chemical demand Cloudy water****Eye discomfort****TOO LOW****Rapid dissipation of chlorine Eye discomfort****Plaster/concrete etching Corrosion of metals** |
| **2. Total alkalinity****as CaCO3** **mg/l (ppm)** | **60** | **80-100 or 120** | **180** | **TOO HIGH****Increased scaling potential Cloudy water** **pH maintained too high****TOO LOW****Corrosion tendency pH bounce** |
| **3. Undissolved****solids****mg/l (ppm)****(Turbidity)** | **None** | **None** | **None** | **TOO HIGH****Chlorine level may be too low****Filtration system may be inoperative****May lead to drowning due to decreased visibility** |
| **4. Dissolved** **solids****mg/l (ppm)** | **300** | **. . .** | **2000** | **TOO HIGH****Chlorine may be less effective Salty taste** **Add fresh water to reduce solids Dull water****Chemical balance difficult to maintain****Scaling may occur****TOO LOW****Total alkalinity may be too low Aggressive water** |

| **B. Chemical****Values (cont’d)**  | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| --- | --- | --- | --- | --- |
| **5. Hardness,****as CaCO3 mg/l** | **50** | **125** | **800** | **TOO HIGH****Scaling may occur Water has bad “feel”****Short filter runs****TOO LOW****Plaster or concrete etching Corrosion may occur** |
| **6. Copper****mg/l (ppm)** | **None** | **None** | **0.3** | **TOO HIGH****Staining may occur Water may discolor****Chlorine dissipates rapidly Filter may plug****May indicate pH too low Corrosion may occur** |
| **7. Iron****mg/l (ppm)** | **None** | **None** | **0.2** | **TOO HIGH****Staining may occur Waste may discolor****Chlorine dissipates rapidly Filter may plug** |
| **8. Manganese** **mg/l (ppm)** | **None** | **None** | **0.05** | **TOO HIGH****Staining may occur** |
| **C. Biological****Values** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Algae** | **None** | **None** | **None** | **Super-chlorinate or shock treat facility** **Supplement with brushing and vacuuming****Maintain adequate free chlorine residual****Use approved algaecide according to label direction** |
| **2. Bacteria** | **None** | **None** | **Refer to 64CSR3** | **If bacteria count exceeds health dept. requirements:****Super-chlorinate recreational water facility** **Follow proper maintenance procedures** **Maintain proper free chlorine residual** |
| **D. Stabilizer** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Cyanuric acid****mg/l (ppm)** | **10** | **30-50** | **100** | **TOO HIGH****May exceed health department regulations****TOO LOW****Chlorine residual rapidly destroyed by sunlight****NOTE****Stabilizer is not needed for indoor facilities** **and should not be used in hot water facilities. Cyanuric acid may titrate as Alkalinity.** |
| **E. Algaecides** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Quaternary****mg/l (ppm)** | **. . .** | **. . .** | **. . .** | **Not permitted in public recreational water facilities.** |

| **E. Algaecides** **(cont’d)** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| --- | --- | --- | --- | --- |
| **2. Copper based****(nonchelated)****mg/l (ppm)** | **0.1** | **0.2** | **0.3** | **Ineffective against some algae.** **Consult health dept. officials before using.** **May contribute to staining.** |
| **3. Copper based****(chelated)****mg/l (ppm)** | **0.1** | **1.0** | **3.0** | **Ineffective against some algae.** **Consult health dept. officials before using.** **May contribute to staining.** |
| **4. Silver based** **mg/l (ppm)** | **0.5** | **1.5** | **3.0** | **Precipitates with cyanuric acid.****Ineffective against some algae.****Consult health dept. officials before use.** |
| **F. Remedial****Practices** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Super-****Chlorination** | **When Combined Chlorine** **is 0.2 mg/l (ppm) or more** | **\* As needed** |
| **2. Required super-****chlorination** **/shock chlorine** | **10\*** |  |  | **\*10 times combined chlorine reading.** **Must be done when the facility is not in use.** **May reopen when free chlorine is below 5.0 ppm.**  |
| **3. Floccing** | **Not Recommended** | **Consult health dept. officials before using.**  |
| **4. Water** **Replacement -****Hot water facility** | **. . .** | **. . .** | **. . .** | **Change water and clean monthly as a minimum, more frequently when heavy use and chemical treatment difficulties are experienced.** |
| **G. Temperature** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Water** **temperature -****Hot water****facility** | **Patron preference** | **. . .** |  **104EF** | **TOO HIGH****Excessive fuel requirement Increased chlorine use****Increased scaling potential Patron discomfort****Health threat to those with high blood pressure****TOO LOW - Patron discomfort** |
| **2. Water temp. -** **Artificially heated**  | **75 EF** | **. . .** | **90 EF** |  |
| **3. Air temperature**  **Indoor facilities** | **Water temp. minus 2EF** | **. . .** | **Water temp.****plus 8 EF** | **Excluding hot water facilities.** |
| **H. Water** **Clarity** | **Minimum** | **Ideal** | **Maximum** | **Comments** |
| **1. Turbidity** | **Must be able to see main drain****or six inch black disk****on bottom of deepest part****from the sidewall.** | **TOO HIGH****Chlorine level may be too low****Filtration level may be inoperative****May lead to drowning due to decreased visibility** |