

National Secondary Drinking Water Standards and Other Aesthetic Contaminants				
Secondary Contaminants				
Contaminant	SMCL	WQA Recommended Treatment Methods	Effects on Water	Sources of Contaminant in Drinking Water
Alkalinity(measured as Calcium Carbonate, CaCO <sub>3</sub> )	<ul style="list-style-type: none"> <li>No federal limit.</li> <li>Low : &lt;30 mg/L</li> <li>High: &gt;300 mg/L</li> </ul>	<ul style="list-style-type: none"> <li>Raise: Soda Ash</li> <li>Lower: White Vinegar, Citric Acid</li> </ul>	<ul style="list-style-type: none"> <li>Low alkalinity waters tend to dissolve minerals and metals</li> <li>High alkalinity waters tend to precipitate minerals and metals</li> </ul>	<ul style="list-style-type: none"> <li>Presence of bicarbonates, carbonates, and hydroxides</li> </ul>
Aluminum	<ul style="list-style-type: none"> <li>0.05 to 0.2mg/L depending on case-by-case circumstances</li> </ul>	<ul style="list-style-type: none"> <li>Cation Exchange</li> <li>Reverse Osmosis</li> <li>Distillation</li> <li>Ultrafiltration</li> <li>Deionization</li> </ul>	<ul style="list-style-type: none"> <li>Colored or tinted water</li> </ul>	<ul style="list-style-type: none"> <li>Alum coagulation treatment</li> <li>Natural deposits</li> </ul>
Chloride	<ul style="list-style-type: none"> <li>250mg/L</li> </ul>	<ul style="list-style-type: none"> <li>Reverse Osmosis</li> <li>Distillation</li> <li>Anion Exchange</li> <li>Electrodialysis</li> <li>Deionization</li> </ul>	<ul style="list-style-type: none"> <li>Salty taste</li> </ul>	<ul style="list-style-type: none"> <li>Natural deposits</li> </ul>
Color	<ul style="list-style-type: none"> <li>15 (color units)</li> </ul>	<ul style="list-style-type: none"> <li>Anion Exchange</li> <li>Activated Carbon</li> <li>Filtration</li> <li>Chlorination</li> <li>Reverse Osmosis</li> <li>Distillation</li> <li>Ozonation</li> </ul>	<ul style="list-style-type: none"> <li>Visible tint</li> </ul>	<ul style="list-style-type: none"> <li>Tannins</li> <li>Natural deposits</li> <li>Iron</li> <li>Copper</li> <li>Manganese</li> </ul>
Copper	<ul style="list-style-type: none"> <li>1.0mg/L</li> </ul>	<ul style="list-style-type: none"> <li>Reverse Osmosis</li> <li>Distillation</li> <li>Cation Exchange (20%-90%)</li> </ul>	<ul style="list-style-type: none"> <li>Blue-green coloration</li> </ul>	<ul style="list-style-type: none"> <li>Copper pipe corrosion</li> <li>Natural</li> </ul>

		<ul style="list-style-type: none"> <li>• Electrodialysis</li> <li>• Submicron Filtration</li> </ul>	<ul style="list-style-type: none"> <li>• and staining</li> <li>• Metallic taste</li> </ul>	<ul style="list-style-type: none"> <li>• deposits</li> <li>• Leaching from wood preservatives</li> </ul>
Corrosivity	<ul style="list-style-type: none"> <li>• Non-corrosive</li> </ul>	<ul style="list-style-type: none"> <li>• Calcite or Calcite/Magnesium Oxide</li> <li>• Soda Ash Chemical Feed</li> <li>• Polyphosphate Feed</li> <li>• Removal of Hydrogen Sulfide</li> <li>• Sodium Silicate Feed</li> </ul>	<ul style="list-style-type: none"> <li>• Metallic taste</li> <li>• Corrosion</li> <li>• Fixture staining</li> <li>• Leaking plumbing</li> </ul>	<ul style="list-style-type: none"> <li>• Very high or very low TDS</li> <li>• Dissolved gases in water, such as oxygen, carbon dioxide, and hydrogen sulfide</li> <li>• Low pH</li> </ul>
Fluoride	<ul style="list-style-type: none"> <li>• 2.0mg/L</li> </ul>	<ul style="list-style-type: none"> <li>• Activated Alumina</li> <li>• Reverse Osmosis</li> <li>• Distillation</li> <li>• Electrodialysis</li> </ul>	<ul style="list-style-type: none"> <li>• Spotting and mottling of teeth</li> </ul>	<ul style="list-style-type: none"> <li>• Natural deposits</li> <li>• Fertilizer</li> <li>• Aluminum industries</li> <li>• Drinking water additive</li> </ul>
Foaming Agents(MBAS) (methyl blue active substances)	<ul style="list-style-type: none"> <li>• 0.5mg/L</li> </ul>	<ul style="list-style-type: none"> <li>• Chlorination</li> <li>• Activated Carbon</li> <li>• Ozonation</li> <li>• Reverse Osmosis</li> <li>• Distillation</li> </ul>	<ul style="list-style-type: none"> <li>• Sudsing</li> <li>• Bitter taste</li> <li>• Odor</li> </ul>	<ul style="list-style-type: none"> <li>• Detergent pollution</li> <li>• Surfactants</li> <li>• Pollution</li> </ul>
Hard Water(measured as Calcium Carbonate,CaCO3)	<ul style="list-style-type: none"> <li>• No federal limit</li> <li>• Soft: &lt;17.1</li> <li>• Slightly hard: 17.1 to 60</li> <li>• Mod. hard: 60 to 120</li> <li>• Hard: 120 to 180</li> <li>• Very hard: 180 and above</li> </ul>	<ul style="list-style-type: none"> <li>• Remove all calcium and magnesium ions with a cation exchange water softener</li> </ul>	<ul style="list-style-type: none"> <li>• Consumes soap and makes cleaning more difficult</li> <li>• Whitish scale deposits</li> <li>• Soap curd and lime scum residue</li> </ul>	<ul style="list-style-type: none"> <li>• Natural deposits causing calcium(lime stone) and magnesium salts in raw water</li> </ul>

Iron	<ul style="list-style-type: none"> <li>0.3mg/L (Total iron)</li> </ul>	<ul style="list-style-type: none"> <li>Filtration(oxidizing filters)</li> <li>Cation Exchange</li> <li>Oxidation/Precipitation/Filtration</li> <li>Disinfection</li> </ul>	<ul style="list-style-type: none"> <li>Rusty color</li> <li>Sediment</li> <li>Reddish or orange stains</li> <li>Metallic taste</li> </ul>	<ul style="list-style-type: none"> <li>Natural Deposits</li> </ul>
Manganese	<ul style="list-style-type: none"> <li>0.05mg/L (Total Manganese)</li> </ul>	<ul style="list-style-type: none"> <li>Filtration (Oxidizing filters)</li> <li>Cation Exchange</li> <li>Oxidation/Precipitation/Filtration</li> <li>Disinfection/Filtration</li> </ul>	<ul style="list-style-type: none"> <li>Dark brown-black stains</li> <li>Bitter, metallic taste</li> </ul>	<ul style="list-style-type: none"> <li>Natural deposits</li> </ul>
MTBE (Methyl Tertiary-Butyl Ether)	<ul style="list-style-type: none"> <li>No federal limit</li> </ul>	<ul style="list-style-type: none"> <li>Activated Carbon</li> <li>Air Stripping</li> </ul>	<ul style="list-style-type: none"> <li>Sweet solvent odor at 0.020 mg/L</li> <li>Possible human carcinogen</li> </ul>	<ul style="list-style-type: none"> <li>"Oxygenator" additive for reformulated gasoline</li> </ul>
Odor	<ul style="list-style-type: none"> <li>3 (threshold odor number)</li> </ul>	<ul style="list-style-type: none"> <li>Activated Carbon</li> <li>Air Stripping</li> <li>Oxidation/Filtration</li> <li>Disinfection/Filtration</li> </ul>	<ul style="list-style-type: none"> <li>Rotten egg</li> <li>Musty</li> <li>Garlic</li> <li>Chemical smell</li> </ul>	<ul style="list-style-type: none"> <li>Chlorine</li> <li>Hydrogen sulfide</li> <li>Organic matter</li> <li>Gasoline contamination</li> <li>Methane gas</li> <li>Septic contamination</li> </ul>
pH	<ul style="list-style-type: none"> <li>6.5 -8.5</li> </ul>	<ul style="list-style-type: none"> <li>Increase by feeding soda ash</li> <li>Decrease by feeding white vinegar or citric acid</li> <li>Neutralizing filter (Calcite or Calcite/Magnesium)</li> </ul>	<ul style="list-style-type: none"> <li>Corrosive water</li> </ul>	<ul style="list-style-type: none"> <li>High carbon dioxide</li> <li>Natural balance of acid and alkalinity</li> </ul>
Silver	<ul style="list-style-type: none"> <li>0.1mg/L</li> </ul>	<ul style="list-style-type: none"> <li>Coagulation/Filtration</li> <li>Submicron Filtration/Activated Carbon</li> <li>Ion Exchange</li> <li>Distillation</li> </ul>	<ul style="list-style-type: none"> <li>Skin Discoloration</li> <li>Greying of white part of</li> </ul>	<ul style="list-style-type: none"> <li>Natural deposits</li> <li>Industrial wastes</li> <li>Water sanitizing</li> </ul>

		<ul style="list-style-type: none"> <li>• Reverse Osmosis</li> </ul>	eye	agent
Sulfate	<ul style="list-style-type: none"> <li>• 250mg/L</li> </ul>	<ul style="list-style-type: none"> <li>• Reverse Osmosis</li> <li>• Distillation</li> <li>• Anion Exchange</li> <li>• Electrodialysis</li> </ul>	<ul style="list-style-type: none"> <li>• Medicinal taste</li> <li>• Laxative effect</li> </ul>	<ul style="list-style-type: none"> <li>• Natural deposits</li> </ul>
Total Dissolved Solids(TDS)	<ul style="list-style-type: none"> <li>• 500mg/L</li> </ul>	<ul style="list-style-type: none"> <li>• Reverse Osmosis</li> <li>• Distillation</li> <li>• Deionization by Ion Exchange</li> <li>• Electrodialysis</li> </ul>	<ul style="list-style-type: none"> <li>• Hard water</li> <li>• Deposits on glasses and fixtures</li> </ul>	<ul style="list-style-type: none"> <li>• Natural deposits</li> <li>• Brackish water intrusion</li> </ul>
Zinc	<ul style="list-style-type: none"> <li>• 5mg/L</li> </ul>	<ul style="list-style-type: none"> <li>• Reverse Osmosis</li> <li>• Distillation</li> <li>• Cation Exchange</li> <li>• Electrodialysis</li> </ul>	<ul style="list-style-type: none"> <li>• Metallic taste</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial wastes</li> <li>• Natural deposits</li> </ul>