

wellcare® information for you about Well Water Treatment Options and Costs

Before considering any type of water treatment, you should have your water tested by a water treatment expert. Most well water comes from groundwater and is a safe, reliable drinking water source for you and your family. If your water tests positive for a contaminant, your local health department can tell you whether there is anything to be concerned about. Some contaminants may be more of a “cosmetic” issue (odor, discoloration, etc.) and may not present any health risks. If you need treatment, the health department can also tell you what methods of treatment are approved in your area.

The table on the following page shows recommended treatments for potential groundwater contaminants. For more information on any of these contaminants, please view our groundwater contaminants information sheets on our website at www.watersystemscouncil.org or call the FREE wellcare® Hotline at 1-888-395-1033. It is important to note that many factors need to be considered in order to determine the best type of treatment for your situation. These factors include the type of contamination, the type of pump (jet or submersible), the size of your tank, the depth and yield of your well, static water level, location of the pressure switch, age of the well, temperature of the groundwater, presence of total dissolved solids in the water, household water needs and flow rates, and many more. A water treatment expert is the best person to advise you on the best treatment for your situation.

The U.S. Environmental Protection Agency (EPA) Primary and Secondary Treatment Levels included in the following chart are national guidelines for public drinking water systems. Some state and local agencies set their own standards and guidelines for testing and treatment. If your state or local agency’s guidelines differ from those in the chart provided, the state or local guidelines supersede those listed below. If you need help to find your state’s guidelines, you can contact the wellcare® Hotline at 1-888-395-1033 (a FREE call) or visit www.welcarehotline.org. Finally, any “Suggested Levels” on the chart below are for single family residential dwellings only. They do not apply to commercial, multi-family or shared wells.

The following is a list of abbreviation used in the chart, and their definitions:

Abbreviation ***Definition***

- mg/L: Milligrams per liter. Milligrams per liter are equal to parts per million (ppm).
- pCi/L: Picocuries per liter. A picocurie is a unit of radioactivity.
- pH level: pH stands for “potential of hydrogen” and is measured on a scale that runs from 0-14. Water with a pH of 7 is neutral, lower than 7 is acidic and higher than 7 is alkali.
- ppb: Parts per billion. Parts per billion (ppb) is the number of units of mass of a contaminant per 1000 million units of total mass.
- ppm: Parts per million.
- µg/L: Micrograms per liter.

Contaminants and their Treatments

Contaminant	EPA PDWR (MCL) ¹	EPA SDWR or Suggested Level ²	Treatment Suggestion		Approximate Cost Range for Treatment ³
			<i>Point-of-Entry Device</i>	<i>Point-of-Use Device</i>	
Arsenic ⁴	10 µg/L, .010 mg/L		Activated Alumina, Anion Exchange, Distillation, Oxidation/Filtration	Reverse Osmosis	\$800-\$3,000
Bacteria	zero		Disinfection to the entire well system is recommended prior to installing a treatment device. See WSC's information sheet, "Disinfecting Your Well," at www.watersystemscouncil.org for this method and other treatment options.		≤\$150
Copper	1.3 mg/L		Activated Alumina, Activated Carbon, Ion Exchange Resins For information on corrosion control, see WSC's information sheet on Copper at www.watersystemscouncil.org .	Reverse Osmosis	\$800-\$3000
Emerging	none	none	Activated Carbon	Reverse Osmosis	\$800-\$3000
Fluoride	4 mg/L	2 mg/L	Activated Alumina, Distillation, Electro dialysis	Reverse Osmosis	≥\$800
Hardness		These classifications are used to measure hardness in water: soft 0-17.1 ppm; slightly hard 17.1-60 ppm; moderately hard 60-120 ppm; hard 120-180 ppm; very hard 180 or more ppm	Ion-Exchange (water softener)		≤\$2000
Iron		300 µg/L, 0.3 mg/L	Shock Chlorination to the entire well system. If problem returns levels of 3.0 mg/L or less an Ion-Exchange system can be used. Levels above 3.0 mg/L consider using Activated Carbon Filtration or Oxidation/Filtration. IMPORTANT: SEE NOTE BELOW. ⁵		≤\$3000
Lead	15 ppb, 0.015 mg/L		Activated Alumina, Activated Carbon, Ion-exchange Resins See WSC's information sheet on Lead at www.watersystemscouncil.org for information on corrosion control.	Reverse Osmosis	\$800-\$3000
Manganese		50 ppb, 0.05 mg/L	Shock Chlorination to the entire well system. If problem returns, low levels of manganese can be removed with Ion-Exchange. For high levels of manganese, consider using Activated Carbon Filtration or Oxidation/Filtration. IMPORTANT: SEE NOTE BELOW. ⁵		≤\$3000
Mercury	2 ppb		Inorganic mercury - recommended treatment includes distillation. Organic mercury - recommended treatment includes Granular Activated Carbon (GAC) system.	For inorganic mercury, you can also use Reverse Osmosis.	\$800-\$4000

Contaminant	EPA PDWR (MCL) ¹	EPA SDWR or Suggested Level ²	Treatment Suggestion		Approximate Cost Range for Treatment ³
			<i>Point-of-Entry Device</i>	<i>Point-of-Use Device</i>	
Methane Gas		If concentrations are above 28 mg/L, the U.S. Department of the Interior, Office of Surface Mining suggests that you take immediate action to reduce this concentration. Concentrations of 10 mg/L or less are considered safe.	A well vent can remove methane from some wells. Contact a certified well contractor in your area to see if a well vent can be installed on your well. Aeration can also be used to remove methane.		\$100-\$4000
MTBE		20 ppb to control odor and 40 ppb to prevent adverse taste. Meeting these control levels will also protect against adverse taste.	Air stripping in packed tower aerators and Granular Activated Carbon (GAC) filters		\$3000-\$4000
Nitrate	10 ppm, mg/L		Ion-Exchange, Electrodialysis, Distillation can be used for smaller quantities	Reverse Osmosis	≥\$800
Nitrite	1 ppm, mg/L		Ion-Exchange, Electrodialysis, Distillation can be used for smaller quantities	Reverse Osmosis	≥\$800
Pesticides		There are 50,000 different pesticides used within the U.S. It is recommended that you test for specific pesticide(s). Contact your local health department or USDA Office to determine which ones are used in your region.	Generally, Granular Activated Carbon (GAC) filters (but may depend on individual pesticide(s) present)	Reverse Osmosis (but may depend on individual pesticide(s) present)	\$800-\$4000
pH		A good guide for well owners is to maintain a pH level of 6.5 - 8.5	Low pH can be treated with a neutralizer. Contact a local water treatment professional to see which type of neutralizer is right for your water system.		\$600-\$2000
Radium	Combined Radium, 226 & 228, 5 pCi/L		Cation Exchange, Distillation, Electrodialysis	Reverse Osmosis	≥\$800
Radon		Some states have recommended action levels for radon in water. Check with your state radon or environmental office.	Levels below 10,000 pCi/L - Granular Activated Carbon (GAC) or Aeration systems. Levels above 10,000 pCi/L - Aeration only		\$3,000-\$6,000
Sodium		20 mg/L	Distillation	Reverse Osmosis	≥\$800

Contaminant	EPA PDWR (MCL) ¹	EPA SDWR or Suggested Level ²	Treatment Suggestion		Approximate Cost Range for Treatment ³
			Point-of-Entry Device	Point-of-Use Device	
Sulfur		Sulfate – 250 ppm, Hydrogen Sulfide – no limit is set because any concentration high enough to pose a health hazard will also make the water too unpalatable to drink.	Small quantities of sulfates can be removed using distillation; large quantities of sulfates may be removed using Ion Exchange. Hydrogen Sulfide can be reduced or removed by shock chlorination, water heater modification, activated carbon filtration, or oxidation/filtration.	Small quantities of sulfates can also be removed using Reverse Osmosis.	≤\$3000
Tannins		Harmless organics, creates yellow cast to water and yellow staining throughout home	Shock chlorination to entire well system; low levels of tannins can be removed using Anion Exchange resins. IMPORTANT: SEE NOTE BELOW. ⁵		≤\$4000
Uranium	30 µg/L, ppb		Coagulation/Filtration, Submicron Filtration, Anion Exchange, Activated Alumina, Distillation, Electrodialysis	Reverse Osmosis	≥\$800

¹Environmental Protection Agency National Primary Drinking Water Regulations, Maximum Contaminant Levels. These are enforceable standards for public water systems.

²Environmental Protection Agency sets National Secondary Drinking Water Regulations, Suggested Maximum Contaminant Levels. These are non-enforceable public health goals.

³Cost is approximate, check with your local treatment professional for rates. Actual costs can vary widely and these figures are provided as general information only.

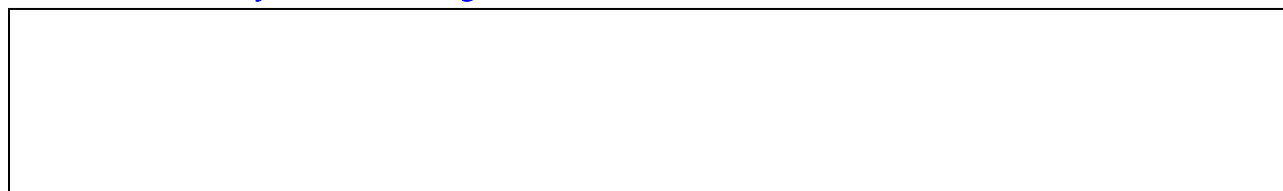
⁴Testing for both forms of Arsenic (3 & 5) should be performed to determine the best treatment.

⁵Shock chlorination is not advised without first having an accurate water test done to determine the type and concentration of each contaminant.

The costs for water treatment devices described above are minimal compared to the cost of hookup to a public water system, which is estimated to be \$12,000 or more per household depending on the distance to the water main, plus monthly water payments. (Source: Virginia Water Resources Research Center, Blacksburg, Virginia, 1996)

For more information about wells and other wellcare® publications

wellcare® is a program of the Water Systems Council (WSC). WSC is a national nonprofit organization dedicated to promoting the wider use of wells as modern and affordable safe drinking water systems and to protecting ground water resources nationwide. This publication is one in a series of wellcare® information sheets. They can be downloaded FREE from the WSC website at www.watersystemscouncil.org. Well owners and others with questions about wells or ground water can also contact the wellcare® hotline at 1-888-395-1033 or visit www.wellcarehotline.org. *Learn more about how to ensure your well will provide safe drinking water for years to come. Join the wellcare® Well Owners Network today! Call 1-888-395-1033 or visit www.watersystemscouncil.org. MEMBERSHIP IS FREE!*



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