

# Chlorine<sup>a</sup>

- Legal Limit (MRDL<sup>b</sup>): 4 mg/L<sup>c</sup>
- Public Health Goal (MRDLG<sup>d</sup>): 4 mg/L

## Common sources of the contaminant in the Central Valley

Chlorine is not generally considered a contaminant because it often is intentionally added to water as a disinfectant to kill germs such as giardia and *E. coli*.<sup>e</sup> While chlorine is important to help keep people from getting sick, it does have some health impacts, particularly if not applied properly or in large amounts. However, most health impacts from drinking water are associated with disinfectant byproducts, which is what chlorine turns into once it mixes and reacts with other substances in water. Health impacts from disinfectant byproducts are discussed separately (see Trihalomethanes).

## Possible health effects of short-term exposure<sup>f</sup>

- Respiratory problems
- Skin rashes
- Sinus irritation
- Dry and itchy eyes
- Light headedness or dizziness
- Stomach discomfort

## Possible health effects of long-term exposure<sup>g</sup>

- Potential increased risk of cancer (particularly bladder cancer), although the evidence is conflicting.

## Sensitive populations

Children and people with respiratory diseases, such as asthma, or skin sensitivity are more sensitive to the health effects associated with high levels of chlorine in water.<sup>h</sup>

## Pathways of exposure<sup>i</sup>

People are more highly exposed to chlorine from inhaling rather than drinking. When water containing chlorine is hot and is made into droplets, some of the chlorine becomes a gas that can be breathed in. This occurs while showering, washing dishes, bathing, and doing laundry. Chlorine is also easily absorbed through the skin, particularly when it is in warm water. However, exposure can also come from drinking over-chlorinated tap water or ice-cubes.

## Tips for reducing exposure at home

- Keep windows open, especially when showering or using hot water. If you don't have a window in your bathroom, use the vent or fan in your bathroom. If you don't have a ceiling fan or a window – you can use a regular floor fan with the door of the bathroom open.
- Avoid taking long, hot showers or baths.
- If possible, install a carbon filter on your shower head and faucets to reduce the amount of chlorine in the water, or get a home treatment device that filters water before it enters the home.



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# Chlorine References

- a. Chlorine is highly reactive, meaning that it reacts to other substances in water and becomes another chemical, also called a byproduct. For more information on chemical byproducts, see the Trihalomethanes informational sheet in this guide.
- b. Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that some use of a disinfectant is necessary for control of microbial contaminants.
- c. EPA (2007), "Drinking Water Contaminants, List of Contaminants and their MCLs," available at [http://www.epa.gov/safewater/contaminants/index.html#d\\_dbps](http://www.epa.gov/safewater/contaminants/index.html#d_dbps) (last visited Nov. 29, 2008); EPA (2001) "Stage 1 Disinfectants and Disinfection Byproducts Rule: A Quick Reference Guide," available at [http://www.epa.gov/safewater/mdbp/qrq\\_st1.pdf](http://www.epa.gov/safewater/mdbp/qrq_st1.pdf) (last visited Nov. 29, 2008).
- d. Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- e. EPA (2006), "Drinking Water Contaminants, Disinfectants," available at <http://www.epa.gov/safewater/hfacts.html> (last visited Nov. 29, 2008).
- f. EPA (2006), "Drinking Water Contaminants, Disinfectants," available at <http://www.epa.gov/safewater/hfacts.html> (last visited Nov. 29, 2008); WHO (2003) "Chlorine in Drinking-water," available at [http://www.who.int/water\\_sanitation\\_health/dwq/chlorine.pdf](http://www.who.int/water_sanitation_health/dwq/chlorine.pdf) (last visited Nov. 29, 2008); ATSDR (2007), "Toxicological Profile for Chlorine, Public Health Statement," available at <http://www.atsdr.cdc.gov/toxprofiles/phs172.html> (last visited Nov. 29, 2008).
- g. WHO (2003) "Chlorine in Drinking-water," available at [http://www.who.int/water\\_sanitation\\_health/dwq/chlorine.pdf](http://www.who.int/water_sanitation_health/dwq/chlorine.pdf) (last visited Nov. 29, 2008).
- h. ATSDR (2007), "Toxicological Profile for Chlorine, Public Health Statement," available at <http://www.atsdr.cdc.gov/toxprofiles/phs172.html> (last visited Nov. 29, 2008); ATSDR (2007), "Toxicological Profile for Chlorine, Health Effects," available at <http://www.atsdr.cdc.gov/toxprofiles/tp172-c3.pdf> (last visited Nov. 29, 2008).
- i. ATSDR (2007), "Toxicological Profile for Chlorine, Public Health Statement," available at <http://www.atsdr.cdc.gov/toxprofiles/phs172.html> (last visited Nov. 29, 2008); ATSDR (2007), "Toxicological Profile for Chlorine, Health Effects," available at <http://www.atsdr.cdc.gov/toxprofiles/tp172-c3.pdf> (last visited Nov. 29, 2008).



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