

Setting California's Drinking Water Quality Standards

By: Hoover Ng, Water Quality Program Manager, Hng@wrd.org

To ensure the safety of drinking water, the providers of tap water are required by the government to take samples regularly and test them for a multitude of compounds to make sure they meet drinking water quality standards. But what exactly are drinking water quality standards? Who sets them and how are they established?

Drinking water quality standards in California are established by the Federal government under the Environmental Protection Agency (USEPA) and the California Department of Public Health (CDPH). Any compounds found in water may be considered a contaminant for possible regulation. However, most contaminants do not present any health concern. For a contaminant to be assigned a drinking water quality standard, the following criteria have to be reviewed and met:

1) A contaminant must have an adverse impact. For contaminants suspected of having a health impact, studies need to be conducted. Even though a contaminant can be detected, it does not automatically imply there are health effects. The California Office of Environmental Health Hazard Assessment (OEHHA) investigates the health effects of potential contaminants and determines the concentration at which there would be no adverse health effects. They perform risk assessments, which include a comprehensive literature review of carcinogenic and non-carcinogenic health effects studies on both humans and animals. Following these health risk assessments, they may propose a **Public Health Goal (PHG)** for the contaminant, which are based solely on health effects information and may or may not be easily obtainable or realistic to achieve with current treatment technologies. For contaminants that do not affect public health but may affect water esthetics, PHGs are not required.

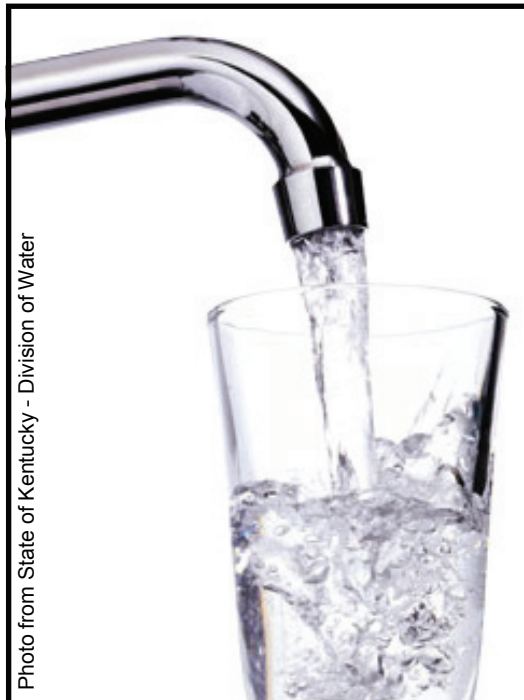


Photo from State of Kentucky - Division of Water

The federal government has a similar procedure to create health based goals, which are called **Maximum Contaminant Level Goals (MCLG)**.

Before a PHG is established in California, sometimes the CDPH establishes a **Notification Level (NL)** for a potential contaminant. This is a health-based advisory level based on potential health impacts. It is not a regulated standard, but just advisory. NLs were created with the intent of providing early warning to the public of potential health effects prior to establishment of a drinking water standard. If a contaminant exceeds a **Response Level**, which can be 10 to 100 times its NL, depending on the contaminant, the CDPH may recommend and advise a water purveyor to remove the water source (e.g., well) from service and may also require public notification. NLs were formerly known as "action levels".

2) It must be present in drinking water systems. Quite often a contaminant may be localized and not widespread. For it to be regulated, it must be found in enough areas of the State that will expose a significant portion of the population to a health risk and at concentrations that might cause health effects. CDPH and USEPA both may require water purveyors to collect samples as an **unregulated contaminant for which monitoring is required (UCMR)** for the purpose of determining how widespread it is.

3) Laboratory methods must be readily available at a reasonable cost. Commercial laboratories should be capable of performing the analysis for the contaminant at the anticipated concentration levels with sufficient accuracy and reliability. In addition, it must be affordable for water systems. If monitoring costs are too expensive, water systems may not be able to effectively comply with future monitoring require-

ments. Laboratory methods developed for or as a result of research, but are not readily available to water systems, would not be considered suitable methods prior to establishment of a standard.

4) Best available technologies (BAT) must be readily available at reasonable cost. If a contaminant is regulated, then some method of treatment is needed to reduce or remove the contaminant. Treatment alternatives that may have been developed for or as a result of research, but are not readily available to water systems for their use, would not be suitable. Pilot or demonstration studies may be needed. Furthermore, the cost for treatment must be reasonable.

5) Health benefits must outweigh the costs of a new drinking water standard. CDPH will review all of the information regarding health effects, occurrence, laboratory methods, treatment, and costs and determine if issuing a new drinking water standard is warranted. If so, then they will propose a draft **Maximum Contaminant Level (MCL)**, which will be the maximum concentration of a proposed contaminant that can be allowed in drinking water. This MCL is set as close as possible to the PHG, but considers laboratory methods, treatment technologies, and treatment costs.

Primary MCLs are health based drinking water standards and must be met to ensure protection of public health.

Secondary MCLs are set not for public health concerns but for the esthetics of drinking water, and should also be met. However, exceedances may be allowed under certain conditions.

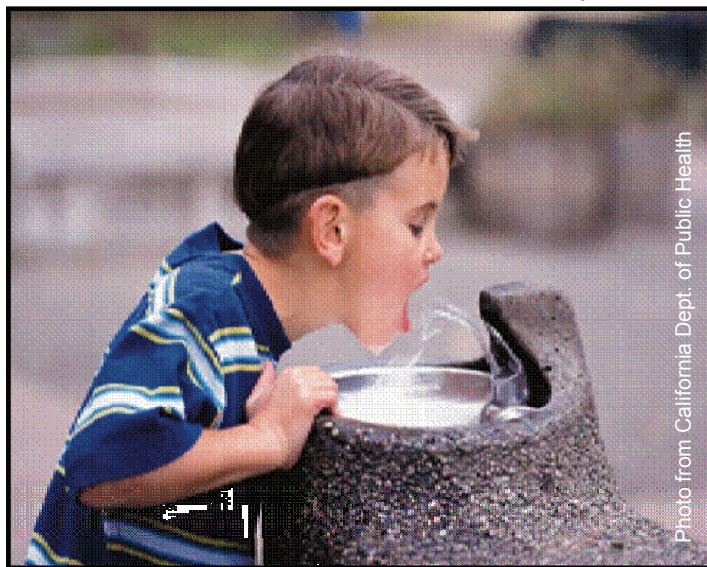
6) Other requirements. The proposed MCL must also meet requirements of other State offices, which include the CDPH's Office of Regulations and Hearings and Budget Office, the State Department of Finance, the State Health and Human Services Agency, and the State Office of Administrative Law.

Once the requirements have been satisfied, which includes a 45 day public comment period and responses, the regulation becomes law.

Federal standards established by USEPA must also be met until CDPH establishes the State standards, which must be at least as stringent.

Perchlorate Case Study: One example of a recently established drinking water standard is perchlorate. It is used in propellants for rockets, missiles, and fireworks, and also in agricultural fertilizers. It disrupts normal functions of the thyroid, thereby affecting the growth and development of both children and adults. It was first found in 1997 in drinking water wells. An action level was initially established at 18 ug/L. The State developed a new method of analysis for commercial laboratories to use.

In 1999, the CDPH added perchlorate to its list of unregulated contaminants which required monitoring of drinking water systems. Results showed widespread occurrence, especially in Southern California. In 2002, based on updated health effects information from the USEPA, the CDPH revised the NL to 4 ug/L. After the OEHHA established a PHG of 6 ug/L in March



2004, the CDPH revised the NL once again to 6 ug/L. Finally, the CDPH adopted an MCL for perchlorate at 6 ug/L, effective October 18, 2007. The BAT for perchlorate is ion exchange and biological fluidized bed reactors.

For a list of current MCLs and more information on drinking water regulations, see the following:

MCLs - <http://ww2.cdph.ca.gov/certlic/drinkingwater/Pages/Chemicalcontaminants.aspx>

MCL setting process - <http://ww2.cdph.ca.gov/certlic/drinkingwater/Pages/MCLprocess.aspx>

Regulatory process - <http://ww2.cdph.ca.gov/certlic/drinkingwater/Pages/Regprocess.aspx>