



Perchlorate in Drinking Water: Action Level and Public Health Goal

Last Update: September 8, 2003

Action Level

DHS uses a 4-µg/L action level for **perchlorate in drinking water**, to protect consumers from its adverse health effects—the inhibition of iodide uptake by the thyroid gland, and the resulting decrease in production of thyroid hormones, which are needed for prenatal and postnatal growth and development, as well as for normal body metabolism. The 4-µg/L concentration corresponds to perchlorate's detection limit for purposes of reporting (DLR).

Detections of perchlorate greater than the action level, like **action levels for other unregulated contaminants**, require local government notification by the water system, and prompt DHS recommendations for consumer notification. At perchlorate levels greater than 40 µg/L, DHS recommends that water system remove the source from service.

DHS first established an action level following its **perchlorate findings in 1997** when, in cooperation with the Office of Environmental Health Hazard Assessment (OEHHA), it reviewed US EPA's 1992 and 1995 evaluations of perchlorate. US EPA, as part of its Superfund activities, had developed a "provisional" reference dose (RfD) for perchlorate, based on the chemical's effects on the thyroid gland. DHS established an 18-µg/L action level, which corresponded to the upper value of the 4- to 18-µg/L range that resulted from US EPA's provisional RfD.

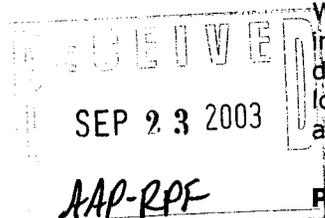
With the 2002 release of revised US EPA's draft RfD, which corresponded to a perchlorate concentration in drinking water of 1 µg/L, DHS concluded that its perchlorate action level needed to be revised downward. Accordingly, on January 18, 2002, DHS reduced the perchlorate action level to 4 µg/L, the lower value of the 4- to 18-µg/L range that resulted from the earlier provisional RfD (and, as mentioned above, a value equal to its DLR).

Public Health Goal

In December 2002, OEHHA released a revised draft perchlorate Public Health Goal (PHG), proposing a concentration of 2 to 6 µg/L. The draft PHG is based on the inhibitory effect of perchlorate on the uptake



3639



of iodide by the thyroid gland.

OEHHA's PHG is anticipated to be completed in late 2003 or early 2004. When final, the PHG will contribute to DHS' development of an **MCL for perchlorate**.

In the meantime, DHS will continue to utilize the 4-µg/L action level.

A comparison of US EPA's assessments and OEHHA's draft PHG is presented in Table 1.

Table 1. Comparison of recent evaluations of perchlorate			
Parameter	USEPA (1992 & 1995)	US EPA (2002) draft	OEHHA (2002) draft
No or lowest observed adverse effect level (NOAEL or LOAEL) (mg/kg/day)	0.14	0.01	0.007
Uncertainty Factor (UF) (product of the following factors, e.g., 10 x 10 x 10)	300-1,000	300	30
— intrahuman variability (among people)	10	3	10
— short-term, not chronic studies	10	3	--
— deficiencies in data	3-10	3	3
— interspecies extrapolation	--	--	--
— LOAEL rather than NOAEL	--	10	--
Reference Dose (RfD) = NOAEL/UF, or LOAEL/UF (mg/kg/day)	0.0001-0.0005	0.00003	0.0002
Relative Source Contribution = the contribution of exposure allocated to drinking water (DW)	--	--	0.8
Corresponding DW concentration (µg/L) for adult; assumptions = 2 L/day consumption and body weight of 70-kg (US EPA) and 65-kg pregnant woman (OEHHA)	4 to 18	1	2*to 6
Corresponding DW concentration (µg/L) for child; assumptions = 1 L/day consumption and 10-kg body weight	1 to 5	0.3	2
*OEHHA also used a benchmark dose method for calculating the draft PHG, which converged around perchlorate concentrations of 2 µg/L for the pregnant woman, lactating woman, and infant			

References

OEHHA, 2002, **Public Health Goal for Perchlorate in Drinking Water**, Draft, Office of Environmental Health Hazard Assessment, December.

US EPA, 1992, Provisional Non-cancer and Cancer Toxicity Values for Potassium Perchlorate (CASRN

7778-74-7) (Aerojet General Corp./CA), Memorandum from Joan S. Dollarhide, Superfund Health Risk Technical Support Center, Environmental Criteria and Assessment Office, Office of Research and Development, to Dan Stralka, US EPA Region IX.

US EPA, 1995, Correspondence from Joan S. Dollarhide, National Center for Environmental Assessment, Office of Research and Development, to Mike Girrard, Chairman, Perchlorate Study Group.

US EPA, 2002, *Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization*, External Review Draft, National Center for Environmental Assessment, NCEA-1-0503, January 16, 2002.
[Go to **NCEA's perchlorate reports**]

[Return to Main Perchlorate Page](#)

[Home](#)