

MEMORANDUM

TO: David P. Spath, Ph.D., Chief
Division of Drinking Water and Environmental Management Branch
Department of Health Services
601 North 7th Street, Mail Stop 92
P.O. Box 942732
Sacramento, California 94234-7320

VIA: George V. Alexeeff, Ph.D., D.A.B.T.
Deputy Director for Scientific Affairs

VIA: Anna M. Fan, Ph.D., Chief
Pesticide and Environmental Toxicology Section

FROM: Robert A. Howd, Ph.D., Chief
Water Toxicology Unit

DATE: December 17, 2003

SUBJECT: GROSS ALPHA AND GROSS BETA SCREENING LEVELS FOR
CHEMICALS IN DRINKING WATER

Staff of the Office of Environmental Health Hazard Assessment (OEHHA) have reviewed and evaluated the categories of gross alpha and gross beta/photon emission represented by California maximum contaminant levels (MCLs) for these radionuclide groupings. From these evaluations, we have developed two documents which are enclosed. These are:

1. Health-Protective Considerations Regarding Measurement of Gross Alpha Particle Activity in Drinking Water
2. Health-Protective Considerations Regarding Measurement of Gross Beta Particle and Photon Activity in Drinking Water

The evaluations include toxicological and risk factors associated with the existing MCLs which were developed by U.S. EPA (effective in 1977) for screening purposes rather than set as

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health protection standards. The evaluations also relied on the latest U.S. EPA radioactive potency factors for carcinogenicity of the various radionuclides.

The documents provide some perspective on the carcinogenic potency of the radionuclides included in the categories of gross alpha and gross beta, at the screening levels of 15 pCi/L for gross alpha and 50 pCi/L for gross beta/photon emission. We have not suggested Public Health Goals (PHGs) corresponding to these screening levels, since the screening levels are by definition analytical tools, not final regulatory limits. In practice, if the screening levels are exceeded, then additional analyses are performed to determine specific radioisotope levels in the drinking water sample. PHGs are being developed separately for several of the more common radioactive elements, i.e., those that have specific MCLs.

The OEHHA evaluations conclude that the present MCLs, developed for use as screening levels for both gross alpha and gross beta/photon emission, are far in excess of the *de minimis* risk level of 10^{-6} (one in a million) for lifetime cancer risks from radioisotopes commonly found in drinking water. Actual cancer risk from radionuclides in drinking water depends on the particular radionuclide(s) present, and the average consumption over a lifetime. The radionuclides detected in drinking water are largely natural radioisotopes, since the manmade radioisotopes resulting from fallout from atmospheric testing of nuclear bombs have decreased considerably since the discontinuation of testing.

Because of the relatively high cancer risks associated with the MCLs used as screening levels for both gross alpha and gross beta/photon emission, OEHHA recommends that the Department of Health Services consider requiring lower screening levels. Lower screening levels (currently the MCLs for gross alpha and gross beta/photon emission), closer to the *de minimis* risk levels represented by the PHGs to be developed for selected radionuclides, would alert water providers to the presence of relatively high radioactivity risk levels in samples, and trigger more extensive analyses.

Should you have any questions about the recommendation and the enclosed technical documents, please contact me at (510) 622-3168 or Dr. Lubow Jowa at (916) 327-7327.

cc: Lubow Jowa, Ph.D.
Staff Toxicologist
Water Toxicology Unit