

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
GUIDANCE FROM HOTLINE COMPENDIUM

WSG H45

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SUBJECT: Adverse Health Effects of Lead and Copper from Avenues Other
Than Ingestion

SOURCE: Jeff Cohen

EPA promulgated standards for lead and copper in drinking water on June 7, 1991 (56 FR 26460). The studies that were performed to set the standards examined lead contamination from ingestion only. However, consumers come in contact with lead contaminated water through many other avenues besides drinking. For example, bathing in water that is contaminated with lead potentially could allow lead to be absorbed through the skin or droplets of water could be inhaled while showering.

In the document Risk Assessment, Management and Communication of Drinking Water Contamination (EPA/625/4-89/0254), EPA does not mention absorption or inhalation as an avenue for contamination from inorganic contaminants. On page 48 the report states that, "The skin is a relatively impermeable to toxicants: this barrier is over 100 cells thick. However, some toxicants, such as carbon tetrachloride, can be absorbed through the skin in sufficient quantities to cause liver injury. Absorption through the skin is possible through the hair follicles, through the cells of the sweat glands and sebaceous glands, and through cuts or abrasions..." Therefore, in a few rare instances, EPA has considered avenues of contamination other than ingestion, but these contaminants are organics like carbon tetrachloride rather than inorganics like lead.

Does EPA consider contact with lead contaminated water through inhalation or absorption through the skin to be a health concern?

Response:

EPA does not consider exposure to lead contaminated water from absorption through the skin or inhalation to be a health threat. Water contains inorganic forms of lead, which are not capable of being absorbed through the skin. Lead in water is unlikely to pose a risk via inhalation, unless contaminated water is used. Studies have shown no significant evidence that these means of exposure to lead contaminated water will result in increased levels of lead in blood, and therefore, no adverse health effects are anticipated.