

Risk Analysis of Toxic Substances in Groundwater Supplies

by

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How can a decision maker, either a professional, or a layperson, determine if the water is safe to drink? What does "safety" mean in a situation where the risks are unknown and, to a large extent, presently unknowable?

In reference to the second question, it has become clear that, particularly when dealing with chemical contaminants, the term "safety" is inappropriate. Safety is a relative and subjective concept; exposures to chemicals cannot be considered in terms of whether they are "safe" or "unsafe", but rather whether the risks associated with them are "acceptable" or "tolerable". This means that to answer the first question--that is, to decide if a drinking water supply contaminated with low levels of potentially toxic pollutants is "safe"--becomes a matter of first determining the extent and nature of the risks, and then deciding whether or not risks are acceptable. The risks, in other words, must be analyzed.

Risk analysis is essential in making decision concerning health hazards for two important reasons: to ensure that public health is protected from the possible harmful effects of environmental contamination (to a degree that is socially acceptable), and as a way that peoples' fears and concerns about insidious hazards such as water supply contamination can be addressed in a rational, straightforward manner. With many environmental hazards, fear can be at least as great a threat to the health and well being of affected persons as the hazard itself. People with contaminants in their water supplies want to *know* if their water is "safe"--yes or no, black or white. There is precious little tolerance for uncertainty among those who believe that their or their childrens' health is threatened from something they neither fully understand, nor can personally control.

This paper is an attempt to broadly outline the role of risk analysis in helping people make decisions about the risks from drinking water--in particular, groundwater, contamination. It is presented on the assumption that, although available information is inadequate and uncertainties are inevitably involved in such decision making, decisions must, nevertheless, be made, and it is desirable to try to find ways to use what limited information there is to make the best decisions possible.