



# AMCO Chemical Superfund Site

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## AMCO 2010 Health Risk Assessment Summary

**A** Human Health Risk Assessment is a method of determining the probability of harm occurring to people from exposure to contaminants at a site. Both the toxic properties of hazardous substances and the ways that people may be exposed to these substances are evaluated. A risk assessment helps determine whether significant risks to people's health may exist at or near a contaminated site and also helps determine risk-based cleanup levels for contaminants at the site. The risk assessment is one factor project managers use to make decisions on how a contaminated site should be cleaned up. Other factors include state and federal regulations, costs, treatment techniques and their feasibility, and community acceptance.

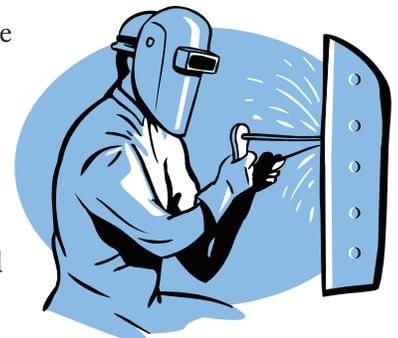
To characterize potential non-cancer effects, estimated intakes of substances and their toxicity values are examined. Potential carcinogenic effects are evaluated by calculating probabilities that an individual will develop cancer over a lifetime of exposure based on projected intakes and chemical-specific dose-response information. Non-carcinogenic health effects are expressed in terms of hazard index (HI) while carcinogenic effects are expressed in terms of an excess lifetime cancer risk (ELCR). Human health risks were compared against EPA's target risk management range of  $10^{-6}$  to  $10^{-4}$  for cancer risks (in other words, a cancer risk of 1 to 100 people in 1 million) and the HI benchmark of 1 for non-cancer hazards (in other words, any value over 1 is avoided). Because the neighborhood surrounding the site is a vulnerable community, EPA has elected to use the most conservative ELCR of  $10^{-6}$ , or 1 in a million people, as the point at which action will be required at this site.

The risks calculated during the risk assessment are based on conservative assumptions so that they are not likely to be exceeded by any member of the exposed population even under reasonable maximum exposure conditions. A risk assessment cannot identify who within an exposed community may or may not become ill due to exposure to toxic agents; nor can a risk assessment be used to associate a particular illness with a particular toxic agent. A risk assessment is best used as a predictive tool to identify those circumstances under which exposure to a toxic agent may potentially lead to unacceptable health outcomes. This information can then be used to select options that will reduce or remove the community's exposure to the toxic agent.

### Potential Health Risks from Exposure to Soil

For the risk assessment at the AMCO site, four areas associated with historical industrial activities were evaluated for two types of workers, industrial and construction, and potential future residential exposures. The areas include the former AMCO facility, parking lot, large vacant lot, and small vacant lot.

Industrial workers may be exposed to soil through incidental ingestion, dermal contact with soil or inhalation of dust. Estimated cancer risks are at the upper end or exceed the EPA's risk



management range for exposure to both shallow soil and deep soil at each of the four areas. Noncancer adverse health effects (HI) exceed the non-cancer threshold of 1 only at the former AMCO facility. Lead concentrations at all four soil exposure areas exceed the California Human Health Screening Level (CHHSL) for an Occupational Scenario of 320 mg/kg..

Construction workers may be exposed to soil through the same exposure pathways as the industrial worker but at higher levels (i.e., more dust in the air) for a shorter period of time. Estimated cancer risks were within EPA's risk management range for exposure to shallow soil and deep soil at each of the four exposure areas. The HIs exceed the non-cancer threshold of 1 at the former AMCO facility, parking lot, and the large vacant lot. Lead concentrations are the same as described for the industrial worker.



The four exposure areas were evaluated for a future resident in the event that any of the areas would be changed to residential. Residents are evaluated for the same exposure pathways as workers, but for a longer period of time. Children are also included in the residential evaluation because they have potential for greater risk of health effects. Estimated cancer risks exceeded EPA's risk management range for exposure to shallow soil and deep soil at all exposure areas. HIs also exceed the non-cancer threshold of 1 at all four of the exposure areas. Lead concentrations all exceed the AMCO residential CHHSL



of 80 mg/kg. See below for residents' risk from soil at their actual homes.

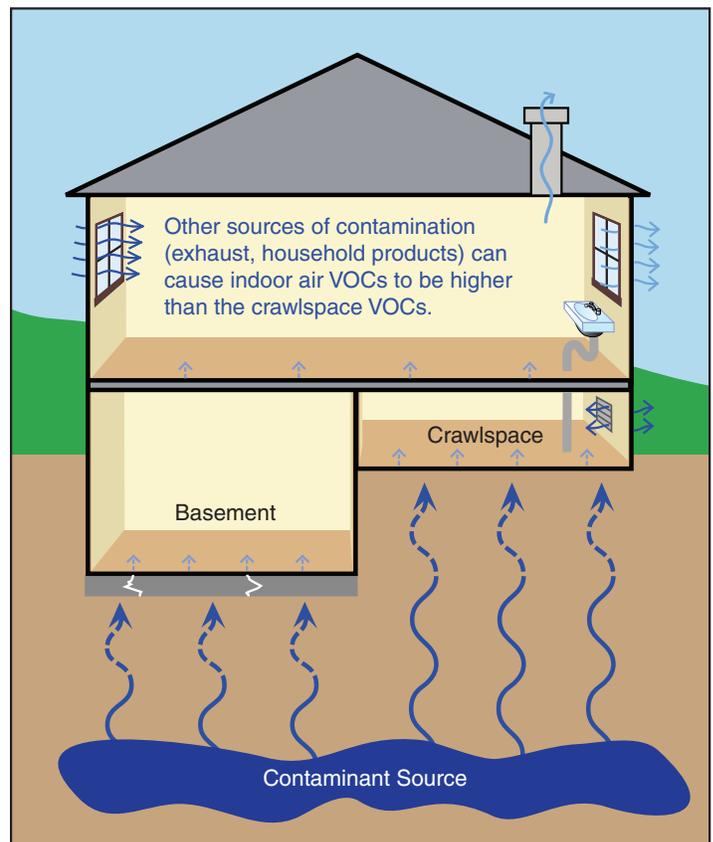
## Potential Health Risks from Exposure to Groundwater

The cancer risks and non-cancer HIs are above EPA's risk management range when residential use of groundwater is considered. However, it is unlikely that groundwater will be used as a source of drinking water because the municipal water supply from EBMUD is from Sierra Nevada.

## Potential Health Risks from Vapor Intrusion

Below are some of the conclusions of the vapor intrusion evaluation:

- The data from the RI sampling of crawl space and ambient air indicates that vapor intrusion was occurring in crawl spaces at the homes. As a precautionary measure, mitigation systems have been installed in selected homes nearest the site.



Vapor Intrusion Pathway

- None of the VOCs detected exceeds its acute reference concentration, indicating that there is no immediate health threat to residents. Please note that “immediate health threat” means that levels of site contaminants do not exceed short-term risk screening levels. A cumulative analysis of all of the factors that can affect a person’s health is not used by the superfund program to determine health risk.
- The source of the VOCs found inside homes is difficult to determine.
- If the level of VOCs inside homes is greater than level of VOCs found in soil gas and crawl space, it is an indication that there are other sources of than VOCs than from vapor intrusion (such as exhaust from freeway traffic, etc.).
- Risks and hazards estimated from the crawl space and outdoor air data indicates that the majority of residences sampled are similar to the risks and hazards estimated from the background samples (collected on Lewis Street located 3 blocks upwind of the site) and the outdoor air samples collected at Prescott Park. This indicates that air quality is poor in the whole area due to other sources of contamination as well.

## Potential Health Risks from Residential Soil

A soil removal action was performed at residential properties adjacent to and near the former AMCO facility as a result of the high levels of lead and other compounds found during the Remedial Investigation soil sampling. As a result of the removal action, the exposure to soil and the risk and hazard has been substantially reduced.

## Potential Health Risks from Homegrown Produce

The detection of TCE, PCE, and vinyl chloride in shallow groundwater and the potential migration of contaminated shallow groundwater into residential areas containing fruit trees prompted concerns that TCE, PCE, vinyl chloride, and other VOCs could be taken up and

transferred into edible fruit or vegetables. None of these chemicals were detected in the fruits and vegetables sampled from adjacent gardens.

Concentrations of metals and VOCs in sampled fruits and vegetables are below levels of concern for ingestion. Of the 47 VOCs analyzed for, only methyl acetate and styrene were detected. Some metals were found in or on the produce including arsenic, chromium, and lead, however, they were found at levels that would not be harmful.

Because produce samples were analyzed for VOCs as well as metals, none of the produce samples were rinsed or washed before analysis. As a result, the metals concentrations could reflect dust or soil deposited on the plant surfaces in addition to metals that were taken up through the root system. Community members should always wash their home grown fruits and vegetables before consuming them.



## Now What?

The risk assessment shows that high risk levels from soil exposure remain for anyone who might live or work at the actual AMCO facility if the pavement is removed. It also shows high risk from possible ingestion of groundwater. Finally, there is a health risk for residents in the entire South Prescott neighborhood due to poor outdoor air quality as a result of many different sources. Improving the outdoor air quality, however, has a much larger scope than that of the Superfund cleanup. The vapor intrusion evaluation shows that the chemicals detected in the crawl space are being detected in the indoor air samples. As a precautionary measure, mitigation systems, including vapor barriers and additional ventilation, have been installed in selected homes nearest the site. The goal of the cleanup is to remove and/or clean the contaminated soil and groundwater so that all of the risk levels are brought down to the protective range. The homes will continue to be monitored until this goal has been attained.

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