Health Consultation

COLLEGE GROVE RESIDENTIAL LEAD CONTAMINATION
(a/k/a COLLEGE GROVE BATTERY CHIP SITE)

COLLEGE GROVE, WILLIAMSON COUNTY, TENNESSEE

EPA FACILITY ID: TNSFN0406979

JANUARY 8, 2004

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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Prepared by:

Tennessee Department of Health
Under a Cooperative Agreement with the
The Agency for Toxic Substances and Disease Registry

Background and Statement of Issues

On October 8, 2003, the Tennessee Department of Health (TDH), Communicable and Environmental Disease Services (CEDS) was contacted by the Tennessee Department of Environment and Conservation (TDEC) regarding a residence in College Grove, Williamson County, Tennessee where battery chips which contained lead were discovered in the yard. The purpose of the health consultation is to determine whether the lead found at the residence currently poses a health hazard. The resident requested information about exposure to lead and possible health related illnesses from such an exposure.

In 1999, TDEC identified battery casings on the CSX Railroad property and on several residential properties. The highest lead concentration was 48,000 parts per million (ppm), while other concentrations ranged from 254ppm to 15,100ppm. The Tennessee Department of Superfund (TSDF) completed a thorough investigation, including private wells and groundwater. The U.S. Environmental Protection Agency (EPA) Region IV, Waste Management Division, assisted TDSF with providing clean-up of the contaminated lead areas.

Twenty or thirty years ago, battery casings were given away to community members and used as fill or driveway paving material. Therefore, occasional digging by some home owners unearths some of these casings. The resident reports buying the home approximately four months ago. He was digging a hole in which to place his children's basketball goal when he dug up some of the old battery casings. Because he didn't know what they were, he took them for testing and discovered the casings contained lead. He became concerned the lead might be affecting his three children, ages 8, 5, and 2. He then contacted TDEC in relation to how to clean up the area. TDEC then contacted TDH concerning the children's health.

The resident was contacted and requested to obtain lead testing for each of his three children even though we believe the risk is minimal, if any at all, due to a short exposure time.

Discussion

Lead is a naturally occurring bluish-gray metallic element and is found in small amounts throughout the earth' crust. It has no taste or odor and does not dissolve in water or burn. Lead has been widely used in batteries, ammunition, electronic circuitry, pipes, fuel, paint, and medical equipment. Lead use in products that frequently contact people or the environment has been greatly reduced in the past thirty years. Yet, humans have spread lead throughout the environment into air, soil, and water (ATSDR 1999).

Lead exposure can be through ingestion, inhalation, or dermal exposure. Dermal exposure to lead is thought to be a minimal health risk. Inhalation of lead contaminated dust is a health threat as lead readily passes from the lungs into the blood. If consumed, differing percentages of lead will be absorbed into the blood depending on the individual's age, types of food eaten, and the chemical form of the lead. Basically,

children with empty stomachs have greater amounts of lead absorption. Once in the blood, lead can travel to soft tissues, including the brain, heart, liver, and kidneys. The body can store lead in bones and teeth. Adults can eliminate 99% of lead that enters their body as waste; children, however, are only able to eliminate 32% of lead that enters their body (ATSDR 1999).

The main target of lead is the nervous system in both adults and children. High levels of lead can damage the brain and kidneys. Children are considerably more sensitive to lead than adults. Children can develop anemia, kidney damage, muscle weakness, learning disabilities, and brain damage (ATSDR 1999).

The resident's children were tested for blood lead levels in October 2003. All three children test results were 4µg/dL each. The Centers for Disease Control (CDC) considers a blood lead level of 10µg/dL to be of concern (ATSDR 1999). These children clearly tested well below the level of concern.

Soil samples have been collected and tested for lead. These samples were collected by a private company; the results have not yet been given to TDH. However, the battery chips have only been found in a small, localized area of the yard. It is unlikely that a person would routinely and consistently contact the contaminated soils because they are localized to a small area.

Children's Health Considerations

The many physical differences between children and adults demand special emphasis when considering environmental exposure. Children could be at greater risk from certain kinds of exposure to hazardous substances. Children play outdoors and engage in hand-to-mouth behaviors that increase their exposure potential. Smaller than adults in stature, children breathe dust, soil, and vapors closer to the ground. In the event of exposure, a child's lower body weight and higher intake rate result in a higher dose of the hazardous substance per unit of body weight. If exposure levels are high enough and occur during critical growth stages, a child's developing body systems can sustain permanent damage. Because of the three small children living at the residence near College Grove, their health was considered in the preparation of this document.

Conclusions

No apparent public health hazard exists at the residence in College Grove. Lead is present in the small area excavated by the homeowner. An exposure pathway exists for the family at this residence, but is likely to be limited. The children's blood levels are below the CDC recommendation.

Recommendations

1. As good public health practice, the residents should take off their shoes and wash their hands before entering the house. These activities will further minimize any exposure to lead.

Public Health Action Plan

1. TDEC is working with the homeowner to remediate the small excavated area.
2. TDEC is also doing further testing at the residence to ensure no further areas of contamination exist.
3. The family was given educational material regarding lead exposure.

References

Agency for Toxic Substances and Disease Registry. 1997. Healthy children—toxic environments. Report of the Child Health Workgroup presented to the Board of Scientific Counselors. Atlanta: US Department of Health and Human Services.

Agency for Toxic Substances and Disease Registry. 1998. Promoting children's health—progress report of the Child Health Workgroup, Board of Scientific Counselors. Atlanta: US Department of Health and Human Services.

Agency for Toxic Substances and Disease Registry. 1999. Toxicological profile for lead. Atlanta: US Department of Health and Human Services.

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CERTIFICATION

This College Grove Residential Lead Contamination Health Consultation was prepared by the Tennessee Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

Alan W. Yarbrough

Technical Project Officer, SPS, SSAB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

Roberta Erlwein

Chief, State Program Section, SSAB, DHAC, ATSDR