

What is a Public Health Assessment?

A public health assessment is a formal government report. It is a review of available information about hazardous substances at a site. It evaluates whether exposure to chemicals might harm people. A public health assessment considers all environmental issues related to actual or possible human exposure. It is not the same thing as a medical exam or a community health study. A public health assessment can be prepared by either the Tennessee Department of Health's Environmental Epidemiology Program (EEP) or the federal Agency for Toxic Substances and Disease Registry (ATSDR). TDH has prepared this PHA, with review and certification by ATSDR.



Overview of the KIF TVA coal ash release

Photo taken 01/08/09 by TVA.

What does a Public Health Assessment consider?

A public health assessment considers how much of a hazardous substance is present at a site or in the community; whether people have been or might become exposed to the hazardous substance; and what exposure pathways, such as breathing, touching, eating, or drinking, are present at the site or in the community.

What is exposure?

Exposure means that you have come into contact with a chemical and it has gotten into your body. You may be exposed to a hazardous substance by breathing, touching, eating or drinking it.



Air samplers at sample location 07.

Source: TDH

How can a chemical get into your body?

If you come into contact with a chemical, there are three ways it can get into your body:

1. **Inhalation** – breathing air that has a chemical in it. Some chemicals come in the form of dusts, mists, or gases.
2. **Ingestion** – eating or drinking something with a chemical in it. Chemicals can be accidentally ingested by swallowing dust or soil.
3. **Contact** – touching a chemical or something that has the chemical in or on it. Some chemicals can pass through your skin and enter your bloodstream. Other chemicals cannot pass through your skin.

Can coal ash be harmful?

When coal is burned, the metals in the coal become concentrated in the ash. The metals in the coal ash have the potential to cause harm to the environment and to people. For this reason, the Tennessee Valley Authority (TVA), the Environmental Protection Agency (EPA), the Tennessee Department of Environment and Conservation (TDEC), and the Tennessee Department of Health (TDH) immediately began sampling and analysis of the ash itself, surface water, groundwater, drinking water and air. TDH reviewed all analytical results to make sure that public health was protected.

Compared with local soil sampled by TDEC, the coal ash at the Kingston Fossil Plant (KIF) is enriched in some metals and not in other metals. Aluminum, arsenic, barium, cadmium, calcium and iron concentrations in KIF's coal ash were higher than in soil. On average, concentrations of

copper, magnesium and manganese were lower in KIF's coal ash than in soil. Concentrations of antimony, chromium, lead, mercury, nickel, selenium, silver, thallium and zinc were not much different in KIF's coal ash than in soil.



Source: TDEC

What have TVA, EPA and TDEC done to protect public health?

TVA, EPA and TDEC have all taken environmental samples for a variety of reasons. All agencies sampled the ash to find out what is in it, and completed analysis to make sure it was not a hazardous waste as defined by EPA. TDEC sampled the municipal drinking water from the Kingston and Rockwood Water Treatment Plants every day, and they continue to sample every week. TDEC samples the river water going into the plants and the water going out for distribution to customers to make sure that the water is not affected by the coal ash. EPA and TDEC sampled well water and spring water to find out if the metals in the coal ash had gotten into the groundwater. TDEC will continue to take samples of the groundwater. TVA, EPA and TDEC have done exhaustive sampling of the Emory, Clinch and Tennessee Rivers to find out how the coal ash is affecting the Watts Bar Reservoir. They continue to sample the rivers. TVA, EPA and TDEC have sampled the air for PM10, PM2.5, and metals in the air at monitors surrounding the coal ash release. TVA and TDEC continue to take air samples. TVA continues to take daily instantaneous air readings at many locations in the wider community.

What data sources did TDH use?

For ash:

TVA, EPA and TDEC

For surface water:

TVA, EPA and TDEC

For public drinking water:

EPA and TDEC

For private wells and springs:

EPA and TDEC

For ambient air:

TVA, EPA and TDEC

For radiological:

TDEC

All data were verified and validated.

What other data sources did TDH consider?

TVA's instantaneous air readings

Environmental sampling done by:

- Duke University
- Appalachian State University
- Appalachian Voices
- Tennessee Aquarium
- Wake Forest University
- United Mountain Defense
- Environmental Integrity Project
- Waterkeeper Alliance's Upper Watauga Riverkeeper Program

TDH's Syndromic Surveillance

TDH's Community Health Survey

TVA's Community Involvement Center

What are the public health implications of the ash spill?

Based on the sampling results by all agencies, TDH is confident that:

- No harm to health should have occurred from touching the coal ash. People had an opportunity to be exposed to the coal ash for about one month before TVA either relocated families or fenced off the coal ash. While coal ash might cause skin irritation, the irritation will stop as soon as the coal ash is washed off.
- Although arsenic was found at concentrations above health comparison values for chronic exposure to children, no harm is expected from a child accidentally eating the coal ash. Chronic health effects from exposure to arsenic require exposures more long term than the type of exposure experienced in this setting. The period of exposure to the coal ash was very short. Small children had little opportunity for direct contact with the coal ash because of the cold, wet weather and the fencing of the ash to prevent contact, as well as the diligence of parents in keeping their children away from the coal ash. The exposure frequency and exposure duration were not long enough to cause harm to the health of children or adults.
- Except in the immediate vicinity of the coal ash release, the coal ash or the metals in the coal ash have not affected surface water in the Watts Bar Reservoir. TVA and TDEC have an advisory for use of the Emory River in the area near the coal ash release. The Army Corps of Engineers and the Coast Guard are patrolling this area to prevent any harm to people. The Emory River from mile marker 1.5 to mile marker 3 is closed to river traffic until February 15, 2010.
- Municipal drinking water from the Kingston and Rockwood water treatment plants has not shown any contamination from the coal ash release since sampling began on December 23, 2008. TDEC is continuing to monitor the drinking water.
- Private well and spring water within 4 miles of the coal ash release have not shown any contamination from the coal ash. TDEC will continue to take periodic samples of private well water in the area.

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What are the public health implications of the ash spill?

- Concentrations of PM10 and PM2.5 have consistently been below EPA regulatory limits since air sampling began on December 31, 2008. Metals in air have consistently been within background levels of metals in the U.S. or below any health comparison values.
- EEP could not determine whether breathing dust near the quarry and along the routes of the quarry trucks has or will harm people's health.
- Concentrations of radionuclides are below the regulatory limits for concentrations of radionuclides in air and water that are protective of public health.

The only way people could have been exposed to the coal ash from late December 2008 through the middle of January 2009 was through direct contact with the coal ash or by accidentally eating some of the coal ash.

The airborne coal ash could affect people exposed to higher concentrations of particulate matter, especially those with pre-existing respiratory or heart conditions. Such effects could include upper airway irritation and aggravation of pre-existing conditions such as asthma, emphysema and other respiratory conditions.

TVA, EPA and TDEC are working to make sure that does not happen. Examples of measures that TVA is taking include:

- applying Flexterra/hydroseed to coal ash where activity is not occurring;
- spraying of water on coal ash where activity is occurring;
- washing cars leaving the site; and
- establishing a central drop off point for delivery of materials that is off site.

What has happened since the Public Health Assessment began?

All conclusions remain valid and unchanged as of April 2010. The Tennessee Department of Health has reviewed data continually as it has become available to make sure the public health of the community near the Tennessee Valley Authority spill site is protected.

The Tennessee Department of Health will continue to follow all sampling and analysis activities and will inform the Tennessee Department of Environment and Conservation and the U.S. Environmental Protection Agency immediately if any results might be a cause of health concern. The Tennessee Department of Health, the Agency for Toxic Substances and Disease Registry, the U.S. Environmental Protection Agency, the Tennessee Department of Environment and Conservation, the Tennessee Valley Authority, Oak Ridge Associated Universities and the Tennessee Poison Center will continue to work together to ensure that public health is protected during the long cleanup process.

If you have comments or questions , please call TDH's Environmental Epidemiology Program at 615-741-7247 or 1-800-404-3006 or write them at:



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You may email comments or questions to EEP.Health@tn.gov.