



## Nuclear Environmental Health Issues

The terrorist attacks on September 11, 2001, brought home to Knox County residents the stark reality of a possible similar episode at the Oak Ridge Department of Energy (DOE) facility. The health and safety issues posed by exposure to nuclear materials – whether radioactive waste or material released as a result of an accidental or criminal incident – are cause for concern to some Knox County residents. Questions may linger about the safety of TVA's nuclear power plants and the DOE operation in Oak Ridge. And what would happen if a dirty bomb were set off in Knoxville? This issue of "Health at a Glance" will discuss these concerns.



Source: TVA

About 30 percent of Tennessee Valley Authority (TVA) power comes from its three nuclear plants: Browns Ferry, near Athens, Ala, and its Tennessee plants, Sequoyah, in Soddy-Daisy, and Watts Bar, near Spring City. The Watts Bar plant, situated downstream on the Tennessee River below the Watts Bar dam, is closest to Knox County.

Following the 1979 accident at the Three Mile Island nuclear power plant in central Pennsylvania, the Nuclear Regulatory Commission (NRC) reexamined emergency planning for public protection near nuclear power plants. NRC now requires "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency."

The plans that resulted from this process consider two zones around each plant. Within ten miles of a plant, there are sirens to alert residents in the event of an emergency, and evacuations routes are posted along highways. Emergency shelters have been set up, and means of notifying the media put into place. Within a 50-mile radius of a plant, an "ingestion pathway emergency planning zone" is in effect, meaning that – depending on the amount of radiation released – crops grown in that area might be affected, as well as milk from cattle grazing on pastures in that range. The portion of Knox County roughly west of Pellissippi Parkway lies within the 50-mile radius of the Watts Bar plant.

This does not mean the rest of Knox County would be unaffected in the event of a catastrophe at Watts Bar, but under foreseeable circumstances, Knox County is not in the immediate 10-mile zone where the highest risk of problems would be found. The exact nature of the risk posed to residents of Knox County would depend on the amount and nature of the material released and the weather at the time, and therefore cannot be totally predicted. For comparison purposes, the scientific consensus is that, at Three Mile Island, the average exposure to radiation within ten miles was eight millirems (equivalent to a chest x-ray) and no individual received more than 100 milirems (about one-third of the average background level of radiation received by US residents in a year). At most, one additional case of cancer resulted from this incident.

The 1986 Chernobyl disaster in the USSR, which resulted in much higher releases of radiation extending over 100 miles, is not an accurate worst-case comparison to a U.S. nuclear power plant due to the vastly different designs of the plants and the safety features legally required to be incorporated into American designs. More information on TVA nuclear power plants can be found at the website: <http://www.tva.gov/power/nuclear/index.htm>. Information on NRC emergency plans can be found at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/emer-plan-prep.html>.

Of course, the Oak Ridge DOE facility lies much closer to Knox County, and has been in operation since World War II. Workers and residents of Oak Ridge have been concerned about potential health effects from historical releases from the facility. The Agency for Toxic Substances and Disease Registry (ATSDR), the branch of CDC required by the 1980 Superfund legislation to perform risk assessments at all hazardous waste sites, has conducted assessments of the environmental and human health effects of releases from Oak Ridge. These reports have been ongoing for several years, and are made available to the public for comment before being finalized.

The ATSDR assessment results so far are that there may have been some small releases of radiation 50 or more years ago that may have reached rural areas of western Knox County, but there is no current health threat from any such events due to the natural decay of radioactive isotopes over time to more stable forms. Given the small number of people living across the river from Oak Ridge at that time, and the low exposures they had (if any) – as well as limitations in the available data and records – CDC could not contribute any increases in cancer rates to releases that might have reached Knox County farms. The Clinch River also has been impacted by DOE operations, but none of the Knox County drinking water supplies come from the affected stretches of the river. Residents eating fish from the Clinch River should be aware of Tennessee Department of Environment and Conservation (TDEC) fish advisories for the Clinch River.

The ATSDR reports for Oak Ridge can be accessed at: <http://www.atsdr.cdc.gov/HAC/oakridge/>. Information on health and environmental effects of Oak Ridge operations can also be obtained from the DOE Information Center, 475 Oak Ridge Turnpike, Oak Ridge TN 37830, 865-241-4780.

In addition to releases from the Oak Ridge facility, there were contaminated scrap metal materials taken from Oak Ridge over the years that ended up at the “David Witherspoon sites” in the Vestal area of South Knoxville. A detailed history of the contamination and legal wrangling over these sites from a citizen-activist perspective can be found at this website, posted by John Nolt, a professor at the University of Tennessee: <http://web.utk.edu/~nolt/envrepts/WSPHOON.htm>. A discussion of the completion of cleanup of these sites by Bechtel Jacobs Company, LLC, the DOE environmental remediation contractor at Oak Ridge, can be found in the report at: <http://www.bechteljacobs.com/pdf/CleanProg2006.pdf>. Clean-up at the Witherspoon sites will be complete in early 2009, but groundwater monitoring will continue. Additional materials may have been disposed at other locations in Knox County, but to date such reports have not been confirmed.

Emergency response agencies (including Knox County Health Department) have response plans in place should a radiation release or dirty bomb be set off in the county during a major public event. Drills are regularly conducted to test preparedness. Additional information on these subjects can be found online at: the websites of the following organizations: Y-12 National Security Complex, <http://www.y12.doe.gov/>, Tennessee Emergency Management Agency, <http://www.tnema.org/Index.htm>, or Knoxville-Knox County Emergency Management Agency, <http://www.cityofknoxville.org/kema/>.

**Knox County Health Department - Epidemiology Program**  
140 Dameron Ave. Knoxville, TN 37917-6413  
[www.knoxcounty.org/health/reports\\_data.php](http://www.knoxcounty.org/health/reports_data.php)

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