BENZENE

Shaw Air Force Base, S.C.

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals used in plastics, resins, nylon and other synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs and pesticides. Natural sources of benzene include emissions from volcanoes and forest fires. Benzene is also a part of crude oil, gasoline and cigarette smoke.

At Shaw, benzene was discovered in groundwater at four sites: ST-30, SD-29, OU-1 and FT-01, primarily due to waste oil disposal, sludge from a jet fuel storage tank and a leaking fuel line, all occurring between the 1940s and 1960s. Benzene contamination at Shaw tends to be limited to the shallow aquifers but is present in the Upper Black Creek Aquifer in a few locations.

Air Force efforts to clean up benzene have included the removal of 80 tons of fuel-contaminated soil at site ST-30 in 1991. Subsequent investigations to determine the extent of groundwater contamination and soil impacts at the site were completed by April 2006. Since benzene tends to float on water, passive skimmers were used from February 2000 to April 2004 to remove benzene from groundwater.

Since then, the Air Force has conducted long-term groundwater monitoring and instituted land use controls at the sites to monitor groundwater and eliminate all benzene exposure pathways to humans. Meanwhile, natural treatment of the site (also called monitored natural attenuation) is still continuing.

WHAT HAPPENS TO BENZENE WHEN IT ENTERS THE ENVIRONMENT?

Industrial processes are the main source of benzene in the environment. Benzene can pass into the air from water and soil. It reacts with other chemicals in the air and breaks down within a few days. Benzene in the air can attach to rain or snow and be carried back down to the ground. It breaks down more slowly in water and soil, and can pass through the soil into groundwater. Benzene does not build up in plants or animals.

WHAT ARE REGULATORY STANDARDS FOR BENZENE?

State and federal drinking water standards for benzene are both set at five parts per billion, comparable to 1 tablespoon (about 250 drops) of water in an Olympic-size swimming pool.

HOW MIGHT I BE EXPOSED TO BENZENE?

There are a few ways people may potentially be exposed to benzene:

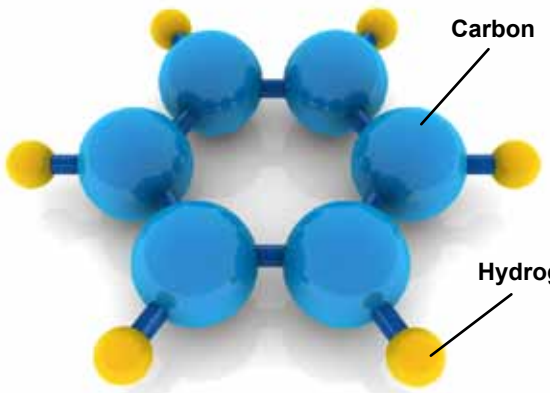
- Outdoor air containing low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles and industrial emissions;
- Vapors (or gases) from products that contain benzene, such as glues, paints, furniture wax and detergents;
- Air around hazardous waste sites or gas stations containing higher levels of benzene;
- Working in industries that make or use benzene.

HOW CAN BENZENE AFFECT MY HEALTH?

Short-term health effects from benzene exposure are skin, eye and respiratory tract irritation; headache; drowsiness; and dizziness. The long-term health effects of benzene exposure are primarily blood-related. An increased cancer risk, particularly leukemia, has been observed in humans exposed to benzene for long periods of time on the job. Benzene may also impact the immune system. High exposures of benzene can result in unconsciousness or death.

There are breath, blood and urine tests people can take if they suspect they were recently exposed to benzene. Shaw has taken comprehensive and deliberate steps to install treatment systems on benzene groundwater plumes and enact land use controls to eliminate exposure risk to benzene by people living and working on and around the base.

Benzene Molecule



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U.S. Environmental Protection Agency: **www.epa.gov**
South Carolina Department of Health & Environmental Control: **www.scdhec.gov**