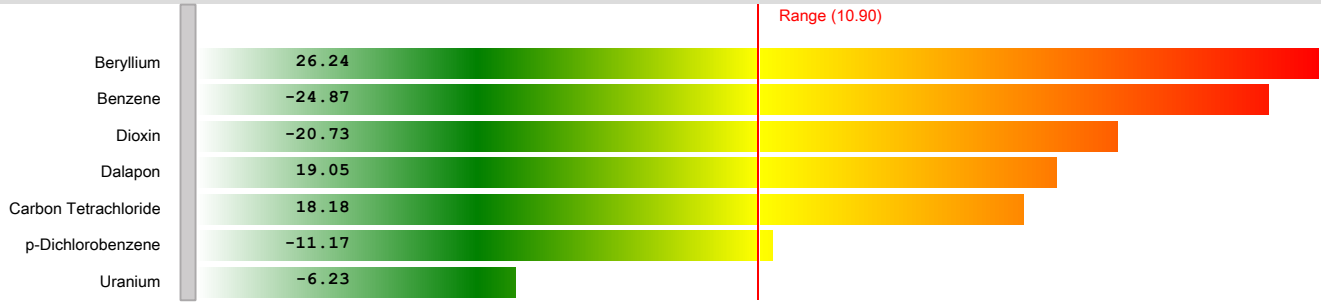
# WATER CONTAMINANTS

Hydration isn't just about getting enough water.  It's also important to drink water that is free from contaminants that promote health risks.  Also, make sure if you are drinking filtered water that you change those filters on the recommended intervals. Educate yourself on the types of bottled water that are truly the best. And make the best choice whenever possible.

The water contaminates scanned for in this biosurvey have been identified by the EPA as the top water contaminates that most often pollute our water.

## Top Water Contaminant Stressors




## Water Contaminant Stressor Descriptions

26.24 **Beryllium**

Beryllium is the chemical element that has the symbol Be and atomic number 4. Beryllium is a hard, grayish metal naturally found in mineral rocks, coal, soil, and volcanic dust. Beryllium compounds are commercially mined, and the beryllium is purified for use in nuclear weapons and reactors, aircraft and space vehicle structures, instruments, x-ray machines, and mirrors. Beryllium ores are used to make specialty ceramics for electrical and high-technology applications. Beryllium alloys are used in automobiles, computers, sports equipment (golf clubs and bicycle frames), and dental bridges.
Beryllium dust enters the air from burning coal and oil. This beryllium dust will eventually settle over the land and water.  It enters water from erosion of rocks and soil, and from industrial waste. Some beryllium compounds will dissolve in water, but most stick to particles and settle to the bottom. Most beryllium in soil does not dissolve in water but remains bound to soil. It does not accumulate in the food chain. The general population is exposed to normally low levels of beryllium in air, food, and water.

People working in industries where beryllium is mined, processed, machined, or converted into metal, alloys, and other chemicals may be exposed to high levels of beryllium. People living near these industries may also be exposed to higher than normal levels of beryllium in air. People living near uncontrolled hazardous waste sites may be exposed to higher than normal levels of beryllium.

Beryllium can be harmful if you breathe it. The effects depend on how much you are exposed to and for how long. If beryllium air levels are high enough (greater than 1000 µg/m3), an acute condition can result. This condition resembles pneumonia and is called acute beryllium disease Occupational and community air standards are effective in preventing most acute lung damage.

Some people (1-15%) become sensitive to beryllium. These individuals may develop an inflammatory reaction in the respiratory system. This condition is called chronic beryllium disease (CBD), and can occur many years after exposure to higher than normal levels of beryllium (greater than 0.5 µg/m3). This disease can make you feel weak and tired, and can cause difficulty in breathing. It can also result in anorexia, weight loss, and may also lead to right side heart enlargement and heart disease in advanced cases. Some people who are sensitized to beryllium may not have any symptoms. The general population is unlikely to develop acute or chronic beryllium disease because ambient air levels of beryllium are normally very low (0.00003-0.0002 µg/m3).

Swallowing beryllium has not been reported to cause effects in humans because very little beryllium is absorbed from the stomach and intestines. Beryllium contact with skin that has been scraped or cut may cause rashes or ulcers. Long term exposure to beryllium can increase the risk of developing lung cancer in people.

EPA has estimated that lifetime exposure to 0.04 µg/m3 beryllium can result in a one in a thousand chance of developing cancer. The EPA restricts the amount of beryllium that industries may release into the air to 0.01 µg/m3, averaged over a 30-day period. The Occupational Safety and Health

Administration (OSHA) sets a limit of 2 µg/m3 of workroom air for an 8-hour work shift.

### -24.87 Benzene

Benzene, or Benzol, is an organic chemical compound that is colorless and a highly flammable liquid with a sweet smell and a relatively high melting point. It is carcinogenic and its use as an additive in gasoline is now limited, but it is an important industrial solvent and precursor in the production of drugs, plastics, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, but it is usually synthesized from other compounds present in petroleum. Benzene is an aromatic hydrocarbon and the second [n]-annulene (6-annulene), a cyclic hydrocarbon with a continuous pi bond.

By replacing one or more of the hydrogen atoms, many important chemicals are derived from benzene. Examples of simple benzene derivatives are phenol, toluene, and aniline. Linking benzene rings gives biphenyl (C6H5-C6H5). Further loss of hydrogen gives "fused" aromatic hydrocarbons, such as naphthalene and anthracene. The limit of the fusion process is the hydrogen-free material graphite.

In heterocycles, carbon atoms in the benzene ring are replaced with other elements. The most important derivatives are the rings containing nitrogen. Replacement of a two CH bonds with N gives, depending on the location of the second N, pyridazine, pyrimidine, and pyrazine.

Today benzene is mainly used as an intermediate to make other chemicals. Its most widely-produced derivatives include styrene, which is used to make polymers and plastics, phenol for resins and adhesives, and cyclohexane, which is used in the manufacture of Nylon. Smaller amounts of benzene are used to make some types of rubbers, lubricants, dyes, detergents, drugs, explosives, napalm and pesticides.

In laboratory research, toluene is now often used as a substitute for benzene. The solvent-properties of the two are similar but toluene is less toxic and has a wider liquid range. It is used in watchmaking for the cleaning of hairsprings.

Benzene exposure has serious health effects. Breathing high levels of benzene can result in death, while low levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, and death.

The major effects of benzene are chronic (long-term) exposure through the blood. Benzene damages the bone marrow and can cause a decrease in red blood cells, leading to anemia. It can also cause excessive bleeding and depress the immune system, increasing the chance of infection. Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men. Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

The US Department of Health and Human Services (DHHS) classifies benzene as a human carcinogen. Long-term exposure to high levels of benzene in the air can cause Acute myeloid leukemia or acute non-lymphocytic leukemia.

REFERENCES:
en.wikipedia.org (2011). Benzene. Retrieved from http://en.wikipedia.org/wiki/Benzene

osha.gov (2011). Benzene. Retrieved from http://www.osha.gov/SLTC/benzene/

### -20.73 Dioxin

Dioxin is the name generally given to a class of super-toxic chemicals. You will not see this chemical name on an ingredient listing. It is often contained in antibacterial ingredients such as triclosan, emulsifiers, PEGs and ethoxylated cleansers such as Sodium Lauryl Sulfate. By binding to a cell’s hormone receptor, dioxin literally modifies the functioning and genetic mechanism of the cell, causing a wide range of effects, from cancer to reduced immunity to nervous system disorders to miscarriages and birth deformity. The tiniest amount can cause damage, and our bodies have no defense against it. The most visible example was Yushchenko, the new Ukrainian President, who was poisoned with dioxin poisoning causes dramatic, permanent, almost horrifying, changes to his appearance which appeared almost overnight.

### 19.05 Dalapon

Common names: Dalapon (ANSI, BSI, WSSA), DPA
Other names: Dalacide (Diachem S.P.A.), Dalapon-Na, Dedweed, Gramevin, Unipon

Action: Selective herbicide; growth regulator.

Use: For quackgrass, bermudagrass, johnsongrass, other perennial and annual grasses, cattails, rushes. Often preplant for established perennial grasses in cropland areas, irrigation ditch banks. Translocates to the roots of most species as a growth regulator.

Formulations: Water soluble powder

Registration Notes: U.S.: Registered in 17 western U.S. states
First Aid: Eyes and skin, flush with plenty of water.  Get medical aid if any irritation develops. Ingestion induce if conscious.

### 18.18 Carbon Tetrachloride

Carbon tetrachloride is the chemical compound with the formula CCl4. It is a reagent in synthetic chemistry and was formerly widely used in fire extinguishers and as a precursor to refrigerants. It is a colorless liquid with a 'sweet' smell that can be detected at low levels.

Both carbon tetrachloride and tetrachloromethane are acceptable names under IUPAC nomenclature, depending on whether it is seen as an inorganic or an organic compound. Colloquially, it is called carbon tet.

In the early 20th century, carbon tetrachloride was widely used as a dry cleaning solvent, as a refrigerant, and in fire extinguishers. However, once it became apparent that carbon tetrachloride exposure had severe adverse health effects, safer alternatives such as tetrachloroethylene were found for these applications, and its use in these roles declined from about 1940 onward. Carbon tetrachloride persisted as a pesticide to kill insects in stored grain, but in 1970, it was banned in consumer products in the United States.

Prior to the Montreal Protocol, large quantities of carbon tetrachloride were used to produce the freon refrigerants R-11 (trichlorofluoromethane) and R-12 (dichlorodifluoromethane). However, these refrigerants are now believed to play a role in ozone depletion and have been phased out. Carbon tetrachloride is still used to manufacture less destructive refrigerants.

Carbon tetrachloride has also been used in the detection of neutrinos.

Exposure to high concentrations of carbon tetrachloride (including vapor) can affect the central nervous system, degenerate the liver and kidneys, and may result (after prolonged exposure) in coma and even death. Chronic exposure to carbon tetrachloride can cause liver and kidney damage and may result in cancer.

Carbon tetrachloride is both ozone-depleting and a greenhouse gas.Since 1992 its atmospheric concentrations have been in decline.

REFERENCES:
en.wikipedia.org (2011). Carbon tetrachloride. Retrieved from http://www.epa.gov/ttn/atw/hlthef/carbonte.html

epa.gov (2000). Carbon tetrachloride. Retrieved from http://www.epa.gov/ttn/atw/hlthef/carbonte.html

### -11.17 p-Dichlorobenzene

p-Dichlorobenzene is used mainly as an insecticidal fumigant against clothes moths and as a deodorant for garbage and restrooms. It is also used as an insecticide and fungicide on crops, and in the manufacture of other organic chemicals and in plastics, dyes, and pharmaceuticals.

Some people who drink water containing p-dichlorobenzene well in excess of the maximum contaminant level (MCL) for many years could experience anemia; damage to their liver, kidneys or spleen; or changes in their blood.

The major source of p-dichlorobenzene in drinking water is discharge from industrial chemical factories.

### -6.23 Uranium

To be exposed to radiation from uranium, you have to eat, drink, or breathe it, or get it on your skin.  Inhaled uranium can stay in the lower part of the lungs for years, giving off radiation to the lungs.  Some particles stay in the lung and some dissolves into the blood.  A small part of the uranium you swallow will also go into your blood. The blood carries uranium throughout your body. Most of it leaves in your urine in a few days, but a little stays in your kidneys and bones, or other soft tissue.  Most people have a very small amounts of uranium, about 1/5,000th of the weight of an aspirin tablet, in their bodies, mainly in their bones.

No human cancer has ever been seen as a result of exposure to natural or depleted uranium. Uranium can decay into other radionuclides, which can cause cancer if you are exposed to enough of them for a long enough time. Exposure to enriched uranium increases your chance of getting cancer because it is more radioactive.