

Important Terms and References



COLLEGE OF AGRICULTURE & LIFE SCIENCES
**Soil, Water and
Environmental Science**



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Important Terms

CFU (Colony Forming Units) – Estimated number of viable bacteria in a sample. This is usually written as CFU/ 100 ml (milliliters of water, see definition below). 100 milliliters of water is about 0.4 cups

DIY – Stands for Do-It-Yourself. This is the method of testing or building things without the direct aid of experts or paid professionals.

Drinking Water Equivalent Level – A type of health advisory (see definition below) that assumes 100% exposure from drinking water. These advisories are established to inform a consumer about the lifetime exposure concentration at which no negative, non-cancer health effects are expected to occur.

Field Blank – A sample that has been exposed to the site of sampling, but without collecting the material of interest. This is used to assess the presence or absence of contamination that comes from the process of sample collection rather than from the material itself. Field blanks are a measure of data quality (quality control).

Guideline – A non-enforceable, but recommended maximum concentration of a chemical.

Inorganic Compounds – Metals, minerals, or compounds that contain little or no carbon and are generally geologically derived (come from the Earth, like the rocks, minerals, fossils, landforms, and the layers of the Earth's surface).

Lifetime Health Advisory – Health based maximum concentrations of a chemical in water. The advisories reported in this booklet are non-enforceable and non-regulatory values. They are different from standards (see definition below). These advisories inform drinking water system operators and state/tribal officials so they can take the appropriate actions to protect their residents. These advisories are non-enforceable and non-regulatory. These advisories are established to inform a consumer about the lifetime exposure concentration at which no negative, non-cancer health effects are expected to occur.

Limit of Detection – The lowest concentration that our laboratory can measure (or detect) a contaminant. Samples that are below the Limit of Detection are represented as half of the detection limit (Limit of Detection/ $\sqrt{2}$).

Microorganism/Microbes/Microbial – An organism that is microscopic, which means it is too small to be seen by the unaided human eye. Microbes refers to any of the microorganisms, including bacteria, fungi, protozoa, and viruses. In this study, we measured bacteria that can indicate the presence of fecal contamination and/or pathogens.

ml (Milliliters) – A unit of measure that is equal to one-thousandth of a liter, equal to a drop of water approximately as large as your thumbnail. One liter contains 1,000 milliliters.

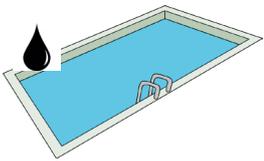
Most Probable Number (MPN) – A method used to estimate the concentration of viable microorganisms in a sample. For the DIY, the MPN was used to estimate the number of sulfur reducing bacteria in the harvested rainwater sample.

Organic Chemicals/Compounds – A chemical (or compound) is a substance consisting of two or more elements (from the periodic table) associated by chemical bonds. An “organic” compound contains the element carbon. Organic compounds may be arranged in rings or chains of carbon atoms, along with atoms of other elements. Common elements besides carbon (C) that are found in organic compounds include hydrogen (H), oxygen (O), nitrogen (N), phosphorus (P), sulfur (S) and halogens like chlorine (Cl) and fluorine (F).

Standards – The standards reported in this booklet are enforceable and regulatory values, developed either by federal agencies or by the state of Arizona for water providers/utilities. They are different from advisories (see definition on previous page) and guidelines.

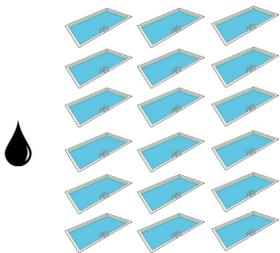
Sulfur Reducing Bacteria (SRB) – Sulfur Reducing Bacteria (SRB) get their energy by reducing (changing) elemental sulfur to hydrogen sulfide. They are a group of bacteria that produce hydrogen sulfide as part of their natural metabolism. They are present in the environment and also in the digestive tracts of human and animals. Their presence may indicate fecal contamination. SRB were selected for rainwater quality assessment in this study because this group of bacteria can grow at room temperature and therefore the experiment can easily be done at the participant’s home.

µg/L (Micrograms per Liter) – A measure of how many micrograms of a substance (such as a metal, chemical) are in a liter of liquid (such as water). This measure can also be called parts per billion (ppb) or 0.0000001%. For comparison, 1 µg/L or ppb is the equivalent to a drop of ink in a 15,000 gallon backyard swimming pool.



Micrograms per liter (µg/L)	Parts per billion (ppb)	1/1,000,000,000
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ng/L (Nanograms per Liter) – A measure of how many nanograms of a substance (such as a metal, chemical) are in a liter of liquid (such as water). This measure can also be called parts per trillion (ppt) or 0.0000000001%. For comparison, 1 ng/L or ppt is the equivalent to a drop of ink in 12-million gallons, this is equal to 18 Olympic size swimming pools.



Nanograms per liter (ng/L)	Parts per trillion (ppt)	1/1,000,000,000,000
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Upper Limit of Detection – The highest concentration that our laboratory can measure (or detect) a contaminant.

Government Agency References

Agency for Toxic Substances and Disease Registry Toxicological Profiles

The Agency for Toxic Substances and Disease Registry produces toxicological profiles, which summarize important studies on a wide range of contaminants, including metals.

 <https://www.atsdr.cdc.gov/substances/index.asp>

Arizona Department of Environmental Quality

The Arizona Department of Environmental Quality's (ADEQ) mission is to protect and enhance public health and the environment. ADEQ core responsibilities include pollution control, environmental monitoring and assessment, compliance management, cleanups, outreach and assistance, and policy development.

 www.azdeq.gov

Arizona Department of Health Services

The Arizona Department of Health Services (ADHS) promotes and protects the health of Arizona's children and adults. ADHS operates programs in behavioral health, disease prevention and control, health promotion, community public health, environmental health, maternal and child health, emergency preparedness and regulation of childcare and assisted living centers, nursing homes, hospitals, other health care providers and emergency services.

 www.azdhs.gov

Arizona Department of Environmental Quality

Arizona Department of Environmental Quality (ADEQ) mission is to protect and enhance public health and the environment in Arizona. To achieve this, we administer the state's environmental laws and delegated federal programs to prevent air, water and land pollution and ensure cleanup.

 <http://www.azdeq.gov/>

University of Arizona Superfund Research Program - Community Information Sheets

The University of Arizona Superfund Research Program (UASRP) uses an interdisciplinary approach to study hazardous waste issues in the U.S. Southwest (including Arizona-Sonora border and Native Nations). Their mission is to advance science and to use the research conducted by our program for the improvement of human health and the environment. The information sheets are designed to provide a basic introduction to environmental issues for community members neighboring contaminated sites as well the general public.

 <http://superfund.arizona.edu/info-material>

US Environmental Protection Agency

The US Environmental Protection Agency (EPA)'s mission is to protect human health and the environment by developing and enforcing regulations, giving grants, studying environmental issues, and educating people about the environment.

 www.epa.gov

United States Food and Drug Administration

The United States Food and Drug Administration (USDA) is responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of our nation's food supply, cosmetics, and products that emit radiation.

 <https://www.fda.gov>