



Basic Radiological

The Basic Radiological product includes testing for uranium and gross alpha & beta. Uranium is a naturally occurring element that is considered mildly radioactive. Uranium is present in most soils at a couple of parts per million, but can be much higher in certain rock formations. Uranium is known to cause problems with kidney toxicity and potentially some types of cancer. The EPA has established an MCL of 30 parts per billion for uranium in drinking water. Gross alpha particles emit radiation due to unstable atoms, and include isotopes such as uranium 238, radium 226, radon 222 and thorium 232. The EPA has established an MCL of 15 picocuries (pCi) per liter for gross alpha. Gross beta particles are subatomic particles emitted from radioactive atoms. Beta particles are equivalent to electrons and have a charge of negative one. Some common beta emitters include tritium, cobalt-60, strontium-90 and radium 228. Gross beta is regulated by the EPA at 4 millirems per year. Running a gross alpha and beta test gives you a general idea of the level of radioactivity and can be less expensive than running test for the individual isotopes which contribute to the radiation.

Standard Radiological

The Standard Radiological package includes the uranium and gross alpha & beta test from the Basic Radiological test package, and adds additional analysis for radon. Radon is a gas that can accumulate in groundwater. It is a health concern because it can be released into the air and when inhaled is known to cause lung cancer. The EPA does not currently regulate radon in water; although in 1999 they proposed some new standards. First, since radon is of most concern in the air, they proposed two standards which allows water systems greater flexibility in limiting exposure. For systems that have an air mitigation program designed to reduce radon inhalation exposure, they would need to meet an MCL of 4,000 picocuries per liter. For systems with no air mitigation program, they would need to meet a more stringent level of 300 picocuries per liter.

Deluxe Radiological

The Deluxe Radiological package includes uranium, gross alpha & beta and radon from the Standard Radiological test package, and adds on radium 226 and 228. Radium is a radioactive element which has 25 different isotopes, with only four that occur in nature. Of those naturally occurring isotopes, radium 226 is the most commonly occurring with the others being radium 228, radium 224 and radium 223. Radium 226 is a decay product of uranium 238, so high levels of uranium may be accompanied by higher levels of radium 226. Radium 226 is an alpha emitter while radium 228 is a beta emitter, so testing for alpha & beta is an economical way of screening for these isotopes. A high level of either can trigger the need for further testing.