Term
11(e)(2) byproduct material Definition: A legal definition from the Atomic Energy Act. The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. See: Byproduct material.
Absorbed Dose Definition: The amount of radiation absorbed by an object or person. The unit for absorbed dose is the rad (U.S. unit) or the gray (Gy, the international unit). One gray is equal to 100 rads.
Acute Exposure Definition: Exposure to an amount of radiation all at once or from multiple exposures in a short period of time. In most cases, a large acute exposure to radiation causes both immediate (see radiation sickness) and delayed effects (cancer or death).
Agreement State Definition: A state that has signed an agreement with the U.S. Nuclear Regulatory Commission (NRC) allowing the state to license and inspect byproduct, source, or special nuclear materials used or possessed within their borders. See, NRC Agreement State Program: https://www.nrc.gov/agreement-states.html
Alpha Particle Definition: A form of particulate ionizing radiation made up of two neutrons and two protons. Alpha particles typically pose no direct or external radiation threat; however, they can pose a serious health threat if ingested or inhaled.
Ambient Air

Term
Definition: The air that surrounds us.
Atom Definition: The smallest (or ultimate) particle of an element that still retains the characteristics of that element.
Background Radiation Definition: Nuclear (or Ionizing) radiation that is always in the environment. The majority of background radiation occurs naturally, and a small fraction comes from man-made elements.
Becquerel Definition: The becquerel is the international unit used to measure radioactivity. One becquerel is the amount of a radioactive material that will undergo one transformation per second. Becquerels are not used to measure radiation dose or radiation exposure. The U.S. unit is the curie (Ci). Acronym: Bq
Beneficiation Definition: The use of milling, flotation, sintering, gravity concentration or other processes to allow the desired mineral to be separated from ore for use for further processing. For regulatory definition, see 40 CFR Part 261.
Beta Particle

Term
Definition: A form of particulate ionizing radiation made up of small, fast-moving particles. Some beta particles are capable of penetrating the skin and causing damage such as skin burns. Beta-emitters are most hazardous when they are inhaled or ingested.
Byproduct Material Definition: A legal definition from Section 11(e) of the Atomic Energy Act. As defined by Nuclear Regulatory Commission (NRC) regulations, byproduct material includes any radioactive material (except enriched uranium or plutonium) produced by a nuclear reactor. It also includes the tailings or wastes produced by the extraction or concentration of uranium or thorium or the fabrication of fuel for nuclear reactors. Additionally, it is any material that has been made radioactive through the use of a particle accelerator or any discrete source of radium-226 used for a commercial, medical, or research activity. In addition, the NRC, in consultation with the EPA, DOE, DHS and others, can designate as byproduct material any source of naturally-occurring radioactive material, other than source material, that it determines would pose a threat to public health and safety or the common defense and security of the United States. For additional detail, see https://www.nrc.gov/materials/byproduct-mat.html.
Chronic Exposure Definition: Continuous or intermittent exposure to radiation over a long period of time. With chronic exposure, there is a delay between the start of the exposure and the observed health effect, such as cancer, benign tumors, cataracts, and potentially harmful genetic changes.
Contact-handled Definition: A legal definition from the WIPP Land Withdrawal Act. Transuranic waste whose surface radioactive dose rate is less than or equal to 200 mrem (2 millisieverts) per hour. Workers may directly handle drums of this waste.
Contamination

Term
Definition: Radioactive contamination occurs when radioactive material is deposited on or in an object or person. A contaminated person has radioactive materials on or inside their body.
Coordinating Agency Definition: The federal department or agency with primary responsibility for coordinating the federal response to a large-scale emergency.
Curie Definition: The curie is U.S. unit used to measure radioactivity. Curies are not used to measure radiation dose. The international unit is the becquerel (Bq). Acronym: Ci
Decay Definition: Disintegration of atomic nuclei resulting in the emission of ionizing radiation.
Decay Chain Definition: The series of decays or transformations that radionuclides go through before reaching a stable form. For example, the decay chain that begins with uranium-238 culminates in lead-206, after forming intermediates such as uranium-234, thorium-230, radium-226, and radon-222. Also called the "decay series."
Decay Products

Term
Definition: The atoms formed and the energy and particles emitted as radioactive material decays to reach a stable form.
Decommission Definition: The process of removing a nuclear facility from service. This involves reducing residual radioactivity to a level that permits the release of the property for limited or unrestricted use.
Decontamination (radioactive) Definition: The removal of radioactive material from a structure, object or person.
Depleted Uranium Definition: Depleted uranium (DU) is the material left over after natural uranium has been processed to make fuel for use in nuclear power. Acronym: DU
Dewatered Definition: Solids or soils are considered dewatered when the free water is removed from the material. Dewatered does not mean dry; the material may still be moist.
Dirty Bomb Definition: A mix of explosives, such as dynamite, with radioactive powder or pellets. Also known as a radiological dispersal device (RDD). A dirty bomb is not a nuclear weapon.

Term
Dose Definition: The amount of radiation delivered to an object or person.
Dose Rate Definition: The amount of radiation delivered to an object or person per unit of time.
Effective Dose Definition: The amount of radiation absorbed by an object or person, adjusted to account for the type of radiation received and the effect on particular organs. The unit used for effective dose is sievert (Sv, the international unit) or rem (U.S. unit).
Emanation Rate Definition: The rate which radon will escape a matrix. Often expressed as a percentage. For soils, typical emanation rates are 20 – 30%; for scale or slag, ~1%.
Epidemiological Studies Definition: Studies looking to describe and interpret the patterns of disease occurrence in human populations and the factors that influence these patterns. Knowledge gained from these studies helps to protect humans from disease and suffering.
Exposure Pathway Definition: The way in which a person is exposed to radiation. The three basic pathways are inhalation (breathing), ingestion (eating

Term
or drinking), and external exposure (from outside the body).
Exposure (radiation) Definition: Radiation exposure, also called irradiation, occurs when radioactive material or a radiation machine emits radiation. You can be exposed to radiation without being contaminated. Having a medical x-ray is an example of being exposed but not contaminated. Many radiation detectors measure exposure rates. The units for exposure are the roentgen (R) and coulomb/kilogram (C/kg).
Fallout Definition: Radioactive material in the air from a nuclear explosion that will cool into sand-like particles and fall to the ground. The early (or local) fallout is defined as those particles which reach the earth within 24 hours.
Federal Radiation Council Definition: The Federal Radiation Council (FRC) was established to advise the President on radiation matters related to health. These responsibilities and authorities were transferred to EPA when it was established by President Nixon under Reorganization Plan No. 3 of 1970. Acronym: FRC
Fission Definition: The splitting of an atomic nucleus into at least two other nuclei with the release of a relatively large amount of energy. Fissioning that occurs without any outside cause is called "spontaneous fission."
Fracking

Term
Definition: Hydraulic fracturing, also referred to as "fracking," is the process of drilling into host formations (shales and tight sandstones) and injecting fluids and sand under pressures great enough to fracture the rock formations to allow the extraction of oil and gas.
Fuel Cycle Definition: The series of steps involved in supplying fuel for nuclear power reactors. The fuel cycle can include milling, fabrication and use of fuel.
Fusion Definition: A reaction in which two lighter atomic nuclei unite to form a heavier one. Reactions of this type release enormous amounts of energy. The energy of the sun and stars come from fusion.
Gamma Rays Definition: A form of ionizing radiation that is made up of weightless packets of energy called photons. Gamma rays can pass completely through the human body; as they pass through, they can cause damage to tissue and DNA.
Generally Applicable Standards Definition: Requirements that apply to general categories of activities, conditions or sites, rather than any specific situation or place. Under the Atomic Energy Act of 1954, EPA has authority to establish "generally applicable environmental standards for the protection of the general environment from radioactive material."
Geographic Information System

Term
Definition: A system for linking information to a particular geographical location. A Geographic Information System (GIS) allows users to manipulate and analyze specific provided data. Acronym: GIS
Gray Definition: A gray is the international unit used to measure absorbed dose (the amount of radiation absorbed by an object or person). The U.S. unit for absorbed dose is the rad. One gray is equal to 100 rads. Acronym: gy
Half-life Definition: The time required for half of the radioactive atoms present to decay or transform. Some radionuclides have half-lives of mere seconds, but others have half-lives of hundreds or millions of years.
Health Physics Definition: A scientific field that focuses on radiation protection of humans and the environment.
Height of burst Definition: The height above the Earth’s surface at which a bomb is detonated.
High-level Radioactive Waste

Term
Definition: Highly radioactive materials produced as a byproduct inside nuclear reactors. Other highly radioactive materials can be designated as high-level waste, if they require permanent isolation.
Igneous Definition: A type of rock formed when molten volcanic rock has cooled and solidified.
Improvised Nuclear Device Definition: A type of nuclear weapon that gives off four types of energy: a blast wave, intense light, heat, and radiation. The bomb dropped on Hiroshima, Japan, at the end of World War II is an example of nuclear device. Acronym: IND
In-situ Recovery Definition: A process to recover uranium in which fluids are injected into ground water to mobilize the uranium in underground deposits. Extraction wells then collect the groundwater, which is processed at the surface to recover the uranium.
Ion Definition: An atom or molecule that has too many or too few electrons, causing it to have an electrical charge.
Ionization Definition: The process of adding one or more electrons to, or removing one or more electrons from, atoms or molecules, thereby creating ions. High temperatures, electrical discharges, or nuclear radiation can cause ionization.

Term
Ionizing Radiation Definition: Radiation with enough energy to remove an orbital electron from an atom, creating an electrically charged atom called an ion. Ionizing radiation can damage living tissues and DNA. Alpha particles, beta particles, gamma rays and x-rays are all forms of ionizing radiation.
Isotope Definition: A form of an element that has the same number of protons but a different number of neutrons in the nucleus, giving it a different atomic mass. For example, uranium has thirty-seven different isotopes, including uranium-235 and uranium-238. All isotopes of an element have the same chemical properties but differ in their nuclear properties. Most elements have both radioactive and non-radioactive isotopes.
Karst Definition: A type of terrain where there are numerous sinkholes and large voids such as caves. Karst is created when water dissolves rocks such as limestone, halite (salt) and gypsum.
Light water reactor Definition: A common nuclear reactor cooled and usually moderated by ordinary water. It is s generic designation including BWR and PWR types. Acronym: LWR
Linear No Threshold Model

Term
Definition: The assumption that the risk of cancer increases linearly as radiation dose increases. This means, for example, that doubling the dose doubles the risk and that even a small dose could result in a correspondingly small risk. Using current science, it is impossible to know what the actual risks are at very small doses. Acronym: LNT
Low-level Radioactive Waste Definition: A legal definition from the Atomic Energy Act. Radioactive waste that is not uranium or thorium mill tailings, spent nuclear fuel, or high level waste. Low-level does necessarily not mean “low radioactivity.” Acronym: LLRW
Maximum Contaminant Level Definition: The amount of a contaminant allowed in public drinking water under the Safe Drinking Water Act (SDWA). Acronym: MCL
Milling Definition: Industrial operations that process ores to concentrate desired minerals. According to the Atomic Energy Act, uranium milling is any activity that results in generation of byproduct material during the processing or uranium or thorium ores. See Byproduct Material.
Millirem Definition: The millirem is the U.S. unit used to measure effective dose. One millirem equals 0.001 rem. The international unit is millisievert (mSv).

Term
Acronym: mrem
Mixed Waste Definition: Mixed waste contains both radioactive and hazardous waste components.
Naturally Occurring Radioactive Materials Definition: Materials found in nature that emit ionizing radiation that have not been moved or concentrated by human activity. Acronym: NORM
Neutron Definition: An elementary particle that is found in the nucleus of every atom except hydrogen. Neutrons have no electrical charge.
Non-ionizing Radiation Definition: Radiation that has enough energy to move atoms or cause them to vibrate, but not enough to remove electrons. Examples of this kind of radiation are radio waves, visible light, and microwaves.
Overburden Definition: Soils and rocks that have been moved out of the way to get to ore are called "overburden." In areas where there are high concentrations of radionuclides in the rock, overburden may have some enhanced radioactivity, but not enough to mine and process.
Performance Assessment

Term
Definition: A mathematical model to simulate the behavior of a waste disposal system over a long-period of time.
Photon Definition: A discrete "packet" of pure electromagnetic energy that has no rest mass and travels at the speed of light. Gamma rays and X rays are both photons.
Picocurie Definition: A discrete "packet" of pure electromagnetic energy that has no rest mass and travels at the speed of light. Gamma rays and X rays are both photons. Acronym: pCi
Plume Definition: A mostly horizontal stream of contamination that is blown downwind from the source.
Porosity Definition: The void volume of soils and rock.
Primordial Definition: Existing since the formation of the solar system, naturally occurring.
Protracted Exposure

Term
Definition: Continuous or intermittent exposure to radiation over a long period of time.
Radiation Definition: Energy given off as either particles or rays.
Radiation sickness Definition: A serious illness that can happen when a person is exposed to very high levels of radiation, usually over a short period of time.
Radioactive Definition: Material that undergoes a spontaneous emission of ionizing radiation from the nuclei of unstable nuclei to become a stable nuclide.
Radioactive Decay Definition: The process in which an unstable (radioactive) nucleus emits radiation and changes to a more stable nucleus.
Radioactivity Definition: The emission of ionizing radiation released by a source in a given time period. The units used to measure radioactivity are becquerel (Bq) and curie (Ci).
Radiogenic

Term
Definition: Caused by ionizing radiation.
Radioisotope Definition: Radioactive forms of the same element, with the same number of protons but different number of neutrons. For example, radium-228, radium-226, and radium-224 are radioisotopes of radium. Radioisotopes are a subset of radionuclides.
Radiological Definition: Of or relating to radiology or nuclear radiation.
Radiological Dispersion Device Definition: A mix of explosives, such as dynamite, with radioactive powder or pellets. Also known as a dirty bomb. A radiological dispersal device is not a nuclear weapon. Acronym: RDD
Radionuclide Definition: Radioactive forms of elements are called radionuclides. Radium-226, cesium-137, and strontium-90 are examples of radionuclides.
Raffinate Definition: What is left behind after the more soluble portion of a material is removed. A liquid from which impurities have been removed by solvent extraction.

Term
Redox Potential Definition: The measure of the tendency of a substance to acquire electrons (chemical reduction). Redox potential is measured in volts (V), or millivolts (mV).
Remote-handled Definition: A legal definition from the WIPP Land Withdrawal Act. Transuranic waste whose surface radioactive dose rate is 200 mrem (2 millisievert) per hour or greater. Drums of this waste are handled with special equipment.
Risk Definition: The probability of injury, disease or death from exposure to a hazard. Radiation risk may refer to all excess cancers caused by radiation exposure (morbidity risk) or only excess fatal cancers (mortality risk). Risk may be expressed as a percent, a fraction, or a decimal value. For example, a 1% excess risk of cancer incidence is the same as a 1 in a hundred (1/100) risk or a risk of 0.01.
Risk Assessment Definition: An evaluation of the risk to human health or the environment from a hazard. Risk assessments may look at either existing hazards or potential hazards.
Roentgen Absorbed Dose Definition: The U.S. unit used to measure the amount of radiation absorbed by an object or person. The international equivalent is the gray (Gy). One hundred rads are equal to 1 gray.

Term
Acronym: rad
Roentgen Equivalent Man Definition: A U.S. unit of dose that accounts for the biological effectiveness of the type and sometimes energy of the radiation involved. The international unit is the sievert. One hundred rems are equal to 1 sievert. Acronym: rem
Shelter in Place Definition: An emergency response instruction meaning get inside a building right away.
Sievert Definition: An international unit used to measure effective dose. The U.S. unit is rem. One sievert is equal to 100 rems.. Acronym: Sv
Slag Definition: Byproduct left after a desired metal is thermally separated from its raw ore.
Source Material Definition: Uranium, thorium or any combination of them. Includes ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of them.
Spent fuel

Term
Definition: Used fuel assemblies removed from a reactor after use and treated as waste. It is still highly radioactive. Often it is another term for used fuel.
Spent Nuclear Fuel Definition: Fuel that has been withdrawn from a nuclear reactor after use. Also referred to as used fuel. It is still highly radioactive.
Statutory Authority Definition: Responsibility and authority assigned by law to a governmental organization.
Tailings Definition: The remaining portion of a metal-bearing ore after some or all of a metal, such as uranium, has been extracted.
Transuranic Definition: Elements with atomic numbers higher than uranium (92). For example, plutonium and americium are transuranics.
Transuranic Waste Definition: Waste materials containing elements with atomic numbers higher than uranium (92) at concentrations greater than 100 nCi/g.
Uncertainty

Term
Definition: The inability to know for sure, often due to limitations in data. Identifying uncertainties helps define the limitations of a scientific study.
X-Rays Definition: A form of ionizing radiation made up of photons originating within the atom’s electron cloud. X-rays are capable passing completely through the human body. Medical x-rays are the single largest source of man-made radiation exposure.
Yellowcake Definition: The solid form of mixed uranium oxide, which is produced from uranium ore in the milling process. Its color can vary from yellow to orange to dark green. Yellowcake is processed into nuclear fuel.