

CHAPTER 12
GLOSSARY

12.0 GLOSSARY

absorbed dose—The energy imparted by ionizing radiation per unit mass of the irradiated material (e.g., biological tissue). The units of absorbed dose are the rad and the gray (Gy). (See gray, quality factor, rad, rem, and sievert.)

accident—An unplanned sequence of events that usually results in undesirable consequences.

actinides—A series of heavy radioactive metallic elements of increasing atomic number (Z number) beginning with actinium (89) and continuing through lawrencium (103).

activities—In this SWEIS, activities are those physical actions used to implement missions, programs, capabilities, or projects.

aggregate—Hard inert materials such as sand, gravel, or slag used for mixing with a cementing material to form concrete.

air pollutant—Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance of which emissions or atmospheric concentrations are regulated, or for which maximum guideline levels have been established because of potential harmful effects on human health and welfare.

air quality—The cleanliness of the air as measured by the levels of pollutants relative to standards or guideline levels established to protect human health and welfare. Air quality is often expressed in terms of the pollutant for which concentrations are the highest percentage of a standard (e.g., air quality may be unacceptable if the level of one pollutant is 150 percent of its standard, even if levels of other pollutants are well below their respective standards).

air quality standards—The legally prescribed level of constituents in the outside air that cannot be exceeded during a specified time in a specified area.

alpha-emitter (α -emitter)—A radioactive substance that decays by releasing an alpha particle.

alpha (α) particle—A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus and has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air). (Also see alpha radiation.)

alpha (α) radiation—A strongly ionizing, but weakly penetrating, form of radiation consisting of positively charged alpha particles emitted spontaneously from the nuclei of certain elements during radioactive decay. Alpha radiation is the least penetrating of the four common types of ionizing radiation (alpha, beta, gamma, and neutron). Even the most energetic alpha particle generally fails to penetrate the dead layers of cells covering the skin and can be easily stopped by a sheet of paper. Alpha radiation is most hazardous when an alpha-emitting particle is ingested or inhaled by an organism.

ambient air—The surrounding atmosphere as it exists around people, plants, and structures.

aquifer—A permeable water-bearing unit of rock or sediment that yields water in a usable quantity to a well or spring.

aquitard (or confining unit)—A rock or sediment unit of relatively low permeability that retards the movement of water in or out of adjacent aquifers.

artesian—Where water in a lower aquifer is under pressure in relation to an overlying confining unit; when intersected by a well, the water will rise up the borehole.

as low as is reasonably achievable (ALARA)—The approach to radiation protection to manage and control exposures (both individual and collective) to the workforce and to the general public to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. ALARA is not a dose limit but a process that has the objective of attaining doses as far below the applicable limits of Title 10 of the *Code of Federal Regulations* Part 835 (10 CFR Part 835) as is reasonably achievable.

asbestiform low-level radioactive waste—Any low-level radioactive waste containing friable asbestos material; Category I nonfriable asbestos-containing material that has become friable; Category I nonfriable asbestos-containing material that will be or has been subjected to sanding, grinding, cutting, or abrading; or Category II nonfriable asbestos-containing material that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder.

background concentration—The level of chemical elements, compounds, or radionuclides in the natural environment not affected by human activities, found by taking measurements in areas unaffected by contamination.

background radiation—Radiation from: (1) cosmic sources; (2) naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material); and (3) global fallout as it exists in the environment (e.g., from the testing of nuclear explosive devices).

best management practices—Structural, nonstructural, and managerial techniques, other than effluent limitations, to prevent or reduce pollution of surface water. They are the most effective and practical means to control pollutants that are compatible with the productive use of the resource to which they are applied. Best management practices are used in both urban and agricultural areas. Best management practices can include schedules of activities; prohibitions of practices; maintenance procedures; treatment requirements; operating procedures; and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

beta-emitter (β -emitter)—A radioactive substance that decays by releasing a beta particle.

beta (β) particle—A charged particle emitted from a nucleus during radioactive decay, with a mass equal to 1/1,837 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron.

beta (β) radiation—Ionizing radiation consisting of fast-moving beta particles (negatively charged) and positrons (positively charged) emitted from the nucleus of an atom during radioactive decay. Beta radiation is more penetrating, but less energized, than alpha radiation. Beta radiation is stopped by clothing or a thin sheet of metal.

biological simulant—A biological substance, or microorganism that shares at least one physical or biological characteristic of a biological agent, that has been shown to be non-pathogenic, and can be used for biological defense testing to replace the agent under study.

biota (biotic)—The plant and animal life of a region.

borrow pit—An excavated area where material has been dug for use as fill at another location (e.g., a gravel pit).

capabilities—This term refers to the combination of facilities, equipment, infrastructure, and expertise necessary to undertake types or groups of activities and to implement mission assignments. Capabilities at the Nevada National Security Site (NNSS) have been established over time, principally through mission assignments and activities directed by program offices.

cask—A heavily shielded container used to store or ship radioactive materials.

Caldera—A near-circular volcanic feature formed by the collapse of rocks overlying a magma chamber from rapid emptying of the chamber during large volume eruptions.

characteristic waste—Solid waste that is classified as hazardous waste because it exhibits any of the following properties or “characteristics”: ignitability, corrosivity, reactivity, or toxicity, as described in 40 CFR 261.20 through 40 CFR 261.24 and Title 6 of the New York Code of Rules and Regulations Subpart 371.3 (6 NYCRR 371.3). (Also see hazardous waste, solid waste, and waste characterization.)

characterization (waste)—The determination of waste composition and properties, whether by review of process knowledge, nondestructive examination or assay, or sampling and analysis, generally done for the purpose of determining appropriate storage, treatment, handling, transport, and disposal requirements.

collective dose—The sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. In this SWEIS, collective dose is expressed in units of person-rem. Person-sieverts is another term for collective dose. (See person-rem, and person-sievert.)

committed dose equivalent—The radiation dose to some specific organ or tissue in the body after the intake of radioactive material. The period examined is commonly 50 years. Committed dose equivalent is expressed in units of rem or sieverts.

committed effective dose equivalent—The radiation dose obtained by multiplying committed dose equivalents (see committed dose equivalent) by weighting factors (applicable to the specific organ or tissue that is irradiated) and summing the resulting products. The period examined is commonly 50 years. Committed effective dose equivalent is expressed in units of rem or sieverts.

communities (biological)—Assemblage of plants and animals (dominated by one to a few species) that live in the same environment and that are mutually sustaining and interdependent.

concentration—The quantity of a substance in a unit quantity of a sample (e.g., milligrams per liter or micrograms per kilogram).

construction and demolition debris—Discarded nonhazardous material including solid, semisolid, or contained gaseous material resulting from construction, demolition, industrial, commercial, mining, and agricultural operations and from community activities. The category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act (Title 42 of the *United States Code* Section 2011 et seq. [42 U.S.C. 2011 et seq.]).

contact-handled waste—Radioactive waste or waste packages whose external dose rate is low enough to permit contact handling by humans during normal waste management activities (waste with a surface dose rate not greater than 200 millirem per hour). (See remote-handled waste.)

contamination—Unwanted chemical elements, compounds, or radioactive material on environmental media (e.g., soil, water, and air), structures (e.g., buildings), equipment, or personnel.

criticality (nuclear)—The condition in which a system is capable of sustaining a nuclear chain reaction.

cultural resources—A prehistoric or historic district, site, building, structure, or object considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Usually divided into three major categories: prehistoric and historic archaeological resources, architectural resources, and traditional cultural resources.

curie (Ci)—Is a unit to describe the intensity of radioactivity in a sample of material, equal to 3.7×10^{10} (i.e., 37,000,000,000) disintegrations per second. Also, a quantity of any radionuclide or mixture of radionuclides that decays at a rate of 37 billion disintegrations per second.

decommissioning—Removing facilities such as processing plants, waste tanks, and burial grounds from service and reducing or stabilizing radioactive contamination. Includes the following concepts: the decontamination, dismantling, and return of an area to its original condition without restrictions on use or occupancy; partial decontamination; isolation of remaining residues; and continued surveillance and restrictions on use or occupancy.

decontamination—The actions taken to reduce or remove chemical or radioactive substances from environmental media (e.g., soil, water, and air), structures (e.g., buildings), equipment, or personnel. Radioactive decontamination may be accomplished by washing, chemical action, mechanical cleaning, or other techniques.

depleted uranium (DU)—Uranium whose content of the fissile isotope uranium-235 is less than the 0.7 percent (by weight) found in natural uranium, so that it contains more uranium-238 than natural uranium. (See enriched uranium.)

deterministic—Referring to events that have no random or probabilistic aspects but proceed in a fixed, predictable fashion.

disposal—As used in this EIS, emplacement of waste so as to ensure isolation from the biosphere with no intent of retrieval, and requiring deliberate action to gain access after emplacement.

disposal facility—A natural and/or manmade structure in which waste is disposed. (Also see disposal.)

DOE Orders—Requirements internal to the U.S. Department of Energy (DOE) that establish DOE policy and procedures, including those for compliance with applicable laws.

dose (radiological)—The radioactive energy that is absorbed by one gram of material that has been irradiated. Dose measures include dose equivalent, effective dose equivalent, committed effective dose equivalent, or committed equivalent dose as defined elsewhere in this glossary.

dose equivalent—A measure of radiological dose that correlates with biological effect on a common scale for all types of ionizing radiation. Defined as a quantity equal to the absorbed dose in tissue multiplied by a quality factor (the biological effectiveness of a given type of radiation) and all other necessary modifying factors at the location of interest. Dose equivalent is expressed in rems or sieverts.

dose rate—The radiation dose delivered per unit time (e.g., rad per year, millirad per year).

downblending—A process in which an appropriate substance is added to a fissile material (generally) such as plutonium or enriched uranium to reduce the concentration of the fissile material in the resulting mixture. The quantity of the fissile material in the resulting mixture remains the same while the total quantity of the mixture increases.

downdraft table—A work area having a surface perforated with holes. A vacuum applied to the surface removes air containing particulates, gases, or vapors from the work area. Air thus removed is then normally treated by filtration or other processes before discharge.

drainage basin—A region or area bounded by a drainage divide and occupied by a drainage system; specifically, the tract of country that gathers water originating as precipitation and contributes to a particular stream channel or system of channels or a lake, reservoir, or other body of water.

drinking water standards—Prescriptive limits on the maximum contaminant level that may be in water for it to be considered safe for human consumption.

dynamic plutonium experiments—These are experiments designed to provide improved knowledge of plutonium material properties, including equation of state and strength, over broad ranges of relevant pressures, temperatures, and time scales. These experiments range from essentially static experiments, such as diamond anvil cell and quasi-static load frame, to increasingly dynamic experiments, such as gas-gun-driven, pulsed-power-driven, special nuclear material-mated-to-high-explosives-driven, and laser-driven experiments. None of these experiments reaches nuclear criticality or involves self-sustaining nuclear reactions.

effective dose equivalent—The dose value obtained by multiplying the dose equivalents received by specified tissues or organs of the body by the appropriate weighting factors applicable to the tissues or organs irradiated, and then summing all of the resulting products. It includes the dose from radiation sources internal and external to the body. The effective dose equivalent is expressed in units of rems or sieverts. (Also see committed effective dose equivalent.)

electron—An elementary particle with a mass of 9.107×10^{-28} grams (or 1/1,837 of a proton) and a negative charge. Electrons surround the positively charged nucleus and determine the chemical properties of the atom. (See *nucleus*.)

endangered species—Any species which is in danger of extinction throughout all or a significant portion of its range from natural or manmade changes in the environment. The list of endangered species can be found in 50 CFR 17.11 (wildlife), 50 CFR 17.12 (plants), and 50 CFR 222.23(a) (marine organisms).

engineered barrier (controls)—Physical controls designed to isolate or contain wastes or hazardous materials (e.g., caps, entombment of facilities, contaminant immobilization).

enriched uranium—Uranium whose content of the fissile isotope uranium-235 is greater than the 0.7 percent (by weight) found in natural uranium. (See depleted uranium.)

environmental impact statement (EIS)—The detailed written statement that is required by section 102(2)(c) of the National Environmental Policy Act (NEPA) for a proposed major Federal action significantly affecting the quality of the human environment. A DOE EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in 40 CFR Parts 1500-1508, and DOE NEPA regulations in 10 CFR Part 1021. The statement includes, among other information, discussions of the environmental impacts of the Proposed Action and all reasonable alternatives, adverse environmental effects that cannot be avoided should the proposal be implemented, the relationship between short-term uses of the human environment and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources.

environmental justice—The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and Tribal programs and policies. Executive Order 12898 directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations.

environmental testing—Subjecting a test unit to specified environments such as vibration, shock, or static acceleration in a controlled environment.

erosion—Natural processes that include weathering, dissolution, abrasion, corrosion, and transportation, by which material is worn away from the Earth's surface.

ephemeral stream—A stream that flows only after a period of heavy precipitation.

exposure—The amount of radiation or pollutant present in a given environment that represents a potential health threat to living organisms.

fault (geologic)—Fracture in the Earth's crust accompanied by displacement of one side of the fracture with respect to the other.

fissile materials—An isotope that readily fissions after absorbing a neutron of any energy, either fast or slow. Fissile materials are uranium-235, uranium-233, plutonium-239, and plutonium-241. Uranium-235 is the only naturally occurring fissile isotope. Although sometimes used as a synonym for fissionable material, this term has acquired a more restricted meaning, namely, any material fissionable by thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239.

fission—The splitting of a nucleus into at least two other nuclei (elements) and the release of a relatively large amount of energy.

fission products—Nuclei (new elements) formed from the fission of heavy elements.

floodplain—That portion of a river valley, adjacent to the river channel, that is built of sediments during the present regimen of the stream and that is covered with water when the river overflows its banks at flood stages.

gamma-emitter (γ -emitter)—A radioactive substance that decays by releasing gamma radiation.

gamma (γ) radiation—High-energy, short-wavelength electromagnetic radiation emitted from the nucleus of an atom during radioactive decay. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma (γ) rays are very penetrating and are best stopped or shielded by dense materials, such as lead or depleted uranium. Gamma rays are similar to x-rays, but are usually more energetic than x-rays. (Also see alpha radiation and beta radiation.)

glove box—A large enclosure that separates workers from equipment used to process hazardous material, while allowing the workers to be in physical contact with the equipment; normally constructed of stainless steel, with large acrylic/lead glass windows. Workers have access to equipment through the use of heavy-duty, lead-impregnated rubber gloves, the cuffs of which are sealed in portholes in the glovebox windows.

gradient—The elevation change within a given distance, particularly of a stream or a land surface.

gray (Gy)—The SI (International System of Units) unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule per kilogram (1 gray is equal to 100 rad). (The joule is the SI unit of energy.) (See absorbed dose, gray, quality factor, rem, and sievert.)

Greater-Than-Class C (GTCC)—Low-level radioactive waste that exceeds the concentration limits established for Class C waste in 10 CFR 61.55. Greater-than-Class C waste and transuranic waste can represent similar wastes. Waste containing transuranics that may be greater-than-Class C by U.S. Nuclear Regulatory Commission (NRC) classification could be considered transuranic by DOE.

groundwater—Water below the ground surface in a zone of saturation. *Related definition:* Subsurface water is all water that exists in the voids found in soil, rocks, and sediment below the land surface, including soil moisture, capillary fringe water, and groundwater. That part of subsurface water in voids completely saturated with water is called groundwater. Subsurface water above the groundwater table is called vadose water.

habitat—The environment or place where a plant or animal naturally or normally grows or lives (includes soil, water, climate, other organisms, and communities.)

half-life (biological)—The time required for a biological system, such as that of a human, to eliminate, by natural processes, half of the amount of a substance (such as a radioactive material) that has entered it.

half-life (radiological)—The time in which one-half of the atoms of a particular radionuclide disintegrate into another nuclear form. Half-lives for specific radionuclides vary from millionths of a second to billions of years.

hazardous chemical—Any chemical that is a physical hazard or a health hazard as defined under the Occupational Safety and Health Act and the Emergency Planning and Community Right-to-Know Act.

hazardous constituent—A constituent listed in 40 CFR Part 261, Appendix VII or VIII, that may cause a waste to be listed as a Resource Conservation and Recovery Act (RCRA) hazardous waste.

hazardous waste—A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20-24 (ignitability, corrosivity, reactivity, and toxicity) or be specifically listed by the U.S. Environmental Protection Agency in 40 CFR 261.31-33.

high-efficiency particulate air (HEPA) filter—An air filter capable of removing at least 99.97 percent of particles 0.3 micrometers (about 0.00001 inch) in diameter. These filters include a pleated fibrous medium (typically fiberglass) capable of capturing very small particles.

high-level waste or high-level radioactive waste—High level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation.

hydraulic conductivity—A measure of the rate at which water can move through a permeable medium (e.g., soil) at a specified pressure and temperature.

hydraulic gradient—The change in elevation of the water table over a distance, resulting in groundwater movement.

hydrodynamic experiments—Hydrodynamic experiments are driven by high-explosives- to assess the performance and safety of nuclear weapons. During a nuclear weapon function test, the behavior of solid materials is similar to liquids, hence the term hydrodynamic. These experiments are conducted using test assemblies that are representative of nuclear weapons. Hydrodynamic experimentation is a central component in maintaining nuclear weapons design and assessment capability. It is coupled with high-performance computer modeling and simulation to certify, without underground nuclear testing, the safety, reliability, and performance of the nuclear physics package of weapons.

hydrodynamic test—A dynamic, integrated systems test of a mock-up nuclear package during which the high explosives are detonated and the resulting motions and reactions of materials and components are observed and measured. The explosively generated high pressures and temperatures cause some of the materials to behave hydraulically (like a fluid). Hydrodynamic tests are used to obtain diagnostic information on the behavior of a nuclear weapon's primary assembly (using simulant materials for the fissile materials in an actual weapon) and to evaluate the effects of aging on the nuclear weapons remaining in the stockpile.

hydrogeology—The study of the occurrence, distribution, and chemistry of all water, including groundwater, surface water, and rainfall.

hydrology—The study of water, including groundwater, surface water, and rainfall.

hydrophytic—A property of a plant that can grow in water or in soil too water-logged for most plants to survive.

industrial waste—As used in this EIS, nonradiological and nonhazardous solid, or semisolid material generated from site cleanup activities.

in situ—In the natural or original position.

institutional controls—Measures taken by Federal or state organizations to maintain waste management facilities safely for a period of time. The measures, active or passive, may include site access control, site monitoring, facility maintenance, and erosion control.

intensity (of an earthquake)—A measure of the effects (due to ground shaking) of an earthquake at a particular location, based on observed damage to structures built by humans, changes in the Earth's surface, and reports of how people felt the earthquake. Earthquake intensity is measured in numerical units on the Modified Mercalli scale. (Also see Modified Mercalli Intensity Scale.)

inventory, radionuclide—The total amount (by volume and/or activity) of radioactive material in a container, building, or disposal facility.

isotope—Any of two or more variations of an element in which the nuclei have the same number of protons (i.e., the same atomic number) but different numbers of neutrons so that their atomic masses differ. Isotopes of a single element possess almost identical chemical properties, but often different physical properties (e.g., carbon-12 and -13 are stable, but carbon-14 is radioactive).

latent cancer fatality (LCF)—A death from cancer occurring some time after, and postulated to be due to, exposure to ionizing radiation or other carcinogens.

latent cancer morbidity—A statistically based estimate of cancer incidences from, and occurring some time after, exposure to ionizing radiation or other carcinogens.

long-term stewardship—Activities necessary to ensure protection of human health and the environment following closure of a site. Long-term stewardship includes engineered and institutional controls designed to contain or to prevent exposure to residual contamination and waste such as monitoring and maintenance activities, record-keeping activities, inspections, groundwater monitoring and treatment, access control, posting signs, and periodic performance reviews.

low-level radioactive waste (LLW)—Radioactive waste not classified as high-level radioactive waste, TRU waste, spent fuel, or byproduct material as defined by Section 11e(2) of the Atomic Energy Act of 1954, as amended. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level radioactive waste, provided the concentration of TRU elements is less than 100 nanocuries per gram.

maximally exposed individual (MEI)—A hypothetical individual whose location and habits result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (inhalation, ingestion, external exposure).

maximally reasonably foreseeable accident—A maximum reasonably foreseeable accident is an accident with the most severe consequences that can reasonably be expected to occur.

maximum contaminant level (MCL)—Under the Safe Drinking Water Act, the maximum permissible concentration of a specific constituent in drinking water that is delivered to any user of a public water system that serves 15 or more connections and 25 or more people. The standards set as maximum contaminant levels take into account the feasibility and cost of attaining the standard.

millirem—One thousandth (10^{-3}) of a rem. (Also see rem.)

missions—In this site-wide environmental impact statement (SWEIS), the term “missions” refers to the major responsibilities assigned to the U.S. Department of Energy (DOE) and National Nuclear Security Administration (NNSA) (described in Section 1.1). DOE and NNSA accomplish these major responsibilities by assigning groups or types of activities to DOE’s system of security laboratories, production facilities, and other sites.

mixed low-level radioactive waste—Low-level radioactive waste that also contains hazardous components regulated under RCRA (42 U.S.C. 6901 et seq.).

mixed waste—Waste containing both radioactive and hazardous components, as defined by the Atomic Energy Act and RCRA, respectively. Mixed waste intended for disposal must meet the Land Disposal Restrictions as listed in 40 CFR Part 268. Mixed waste is a generic term for specific types of mixed waste such as mixed low-level radioactive waste (MLLW), and mixed TRU waste.

mitigation—(1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments.

Modified Mercalli Intensity Scale—The Modified Mercalli Intensity Scale is a standard of relative measurement of earthquake intensity developed to fit construction conditions in most of the United States. It is a 12-step scale, with values from I (not felt except by a very few people) to XII (damage total). A Modified Mercalli Intensity is a numerical value on the Modified Mercalli Scale. (See intensity [of an earthquake].)

Mojave Global Change Facility (MGCF)—MGCF was established in Area 5 of the NNSS to examine the impact of global climate change factors other than increased carbon dioxide (i.e., increasing summer monsoon rains, increased nitrogen deposition, and disturbance or destruction of the desert soil crust) on the Mojave Desert ecosystem.

morphology—The observation of the form of lands.

nanocurie—0.000000001 (10^{-9}) of a curie. (Also see curie.)

neutron—An uncharged elementary particle with a mass slightly greater than that of the proton. Neutrons are found in the nucleus of every atom heavier than hydrogen-1. (See *nucleus* and *proton*.)

neutron (n) radiation—The emission of neutrons from atomic nuclei. Neutrons are uncharged subatomic particles of nearly the same mass as protons. Interaction with atomic nuclei in matter results indirectly in ionization and thus an absorbed dose to biological material. Neutron bombardment of heavy nuclei (e.g., uranium, plutonium) can result in fission. Highly penetrating, neutrons can be stopped by thick masses of concrete, water or paraffin.

Nevada Desert Free-Air Carbon Dioxide Enrichment (FACE) Facility—An environmental research facilities located in Area 5 of the Nevada National Security Site (NNSS) that conducts long-term environmental research. FACE is a state-of-the-art facility designed to study responses of an undisturbed desert ecosystem to increasing levels of atmospheric carbon dioxide. This facility is in a standby condition due to lack of funding.

noncommunity water supply—a water system that provides water for drinking or household purposes to 25 or more persons at least 60 days per year or has 15 or more service connections. Noncommunity water systems serve either a transient or a nontransient population.

nontransient, noncommunity water system—A water system regularly serves at least 25 of the same people more than six months per year. For example, a school or business with its own water supply is considered a non-transient system.

nuclear forensics—Nuclear forensics, the analysis of nuclear materials recovered from either the capture of unused materials or the radioactive debris following a nuclear explosion, can contribute significantly to the identification of the sources of the materials and the industrial processes used to obtain them. In the case of an explosion, nuclear forensics can also reconstruct key features of the nuclear device.

nuclear material—A composite term applied to: (1) special nuclear material; (2) source material such as uranium or thorium or ores containing uranium or thorium; and (3) byproduct material, which is any radioactive material that is made radioactive by exposure to the radiation incident to the process of producing or using special nuclear material.

nuclear testing—An underground nuclear weapons test of either a single underground nuclear explosion or two or more underground nuclear explosions conducted at NNSS within an area delineated by a circle having a diameter of two kilometers and conducted within a total period of 0.1 second. The yield of a test shall be the aggregate yield of all explosions in the test.

nuclear weapons simulator—A device that simulates some aspect of a nuclear weapon, but can not produce an explosion resulting from the energy released by reactions involving atomic nuclei, either fission, fusion, or both.

nuclear weapon pit— The pit is the central core of a nuclear weapon containing plutonium-239 and/or highly enriched uranium that undergoes fission when compressed by high explosives. The pit and the high explosive are known as the “primary” of a nuclear weapon.

nucleus—The positively charged central portion of an atom that composes nearly all of the atomic mass and consists of protons and neutrons, except in hydrogen, in which it consists of one proton only. (See *neutron* and *proton*.)

nuclide—An atomic nucleus specified by its atomic weight, atomic number, and energy state; a radionuclide is a radioactive nuclide.

occupational dose—Whole-body radiation dose received by workers participating in a given task or over the course of employment.

perennial stream—A stream that flows throughout the year.

permeability—The rate at which liquids or gasses pass through materials in a specified direction. In hydrology, it is used to describe the capacity of a rock, sediment, or soil for transmitting groundwater. Permeability depends on the size and shape of the pores between soil particles and how they are interconnected.

person-rem—A unit of collective radiation dose applied to populations or groups of individuals (see collective dose); that is, a unit for expressing the dose when summed across all persons in a specified population or group. One person-rem equals 0.01 person-sieverts.

person-sievert (person-Sv)—A unit of collective radiation dose applied to populations or groups of individuals (see collective dose); that is, a unit for expressing the dose when summed across all persons in a specified population or group. One person-sievert equals 100 person-rem.

photon—A unit of electromagnetic energy exhibiting behavior like that of a particle.

picocurie—0.000000000001 (10^{-12}) of a curie. (Also see curie.)

piezometer—An instrument used for measuring the pressure of groundwater.

pit (nuclear)—The pit is the central core of a nuclear weapon containing plutonium-239 and/or highly enriched uranium that undergoes fission when compressed by high explosives. The pit and the high explosive are known as the “primary” of a nuclear weapon.

pit (waste management)—An excavation similar to a trench within which waste is emplaced for disposal.

pollution prevention—The use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and waste into land, water, and air. For DOE, this includes recycling activities.

polychlorinated biphenyls (PCBs)—A group of toxic, persistent chemicals regulated under the Toxic Substances Control Act used for insulating purposes in electrical transformers and capacitors and in gas pipeline systems.

population dose—See collective dose.

programs—DOE and NNSA are organized into program offices, each of which has primary responsibilities within the set of DOE and NNSA missions. Funding and direction for activities at DOE facilities are provided through these program offices, and similarly coordinated sets of activities to meet program office responsibilities are often referred to as “programs.” Programs are usually long-term efforts with broad goals or requirements.

projects—This term is used to describe activities with a clear beginning and end that are undertaken to meet a specific goal or need. Projects can vary in scale from very small (such as a project to undertake one experiment or a series of small experiments) to major (such as a project to construct and start up a new nuclear facility). Projects are usually relatively short-term efforts and can cross multiple programs and missions, although they are usually “sponsored” by a primary program office. In this SWEIS, “projects” is usually used more narrowly to describe construction activities, including facility modifications (such as a project to build a new office building or to establish and demonstrate a new capability). Construction projects considered reasonably foreseeable at the NNSS over about a 10-year period are discussed and analyzed in this SWEIS.

proton—An elementary nuclear particle with a positive charge equal in magnitude to the negative charge of the electron; it is a constituent of all atomic nuclei. The atomic number of an element indicates the number of protons in the nucleus of each atom of that element. (See *electron* and *nucleus*.)

public—Anyone who may be impacted by, interested in, or aware of operations at NNSS or other DOE/NNSA facilities. With respect to normal operations or accidents analyzed in this environmental impact statement, the public includes anyone outside the boundary of the NNSA property that may be exposed to contaminants.

public water system (PWS)—A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.

pulse power—The technology of using electrical energy stores for producing multi-terawatt (10^{12} Watts or higher) pulses of electrical power for inertial confinement fusion, nuclear weapon effects simulation, and directed energy weapons.

quality factor—The factor by which the absorbed dose (rad or gray) is to be multiplied to obtain a quantity that expresses, on a common scale for all ionizing radiation, the biological damage (rem or sievert) to an exposed individual. It is used because some types of radiation, such as alpha particles, are more biologically damaging internally than other types. (See absorbed dose, gray, rad, rem, and sievert).

rad—See *radiation absorbed dose*.

radiation absorbed dose (rad)—A unit of absorbed dose. One rad is equal to an absorbed dose of 0.01 joule per kilogram (1 rad is equal to 0.01 gray). The joule is the SI (International System of Units) unit of energy. (See *absorbed dose*, *gray*, *quality factor*, *rem*, and *sievert*.)

radioactive decay—The decrease in the amount of any radioactive material with the passage of time, due to the spontaneous emission from the atomic nuclei of either alpha or beta particles, often accompanied by gamma radiation. (Also see half-life.)

radioactive waste—Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value considering costs of recovery.

radioactivity—*Defined as a process:* The spontaneous transformation of unstable atomic nuclei, usually accompanied by the emission of ionizing radiation. *Defined as a property:* The property of unstable nuclei in certain atoms to spontaneously emit ionizing radiation during nuclear transformations.

radioisotope thermoelectric generator (RTG)—An electrical generator that derives its electric power from heat produced by the decay of radioactive strontium-90, plutonium-238, or other suitable isotopes. The heat generated is directly converted into electricity, in a passive process, by an array of thermocouples.

radiological survey—The evaluation of the radiation hazard accompanying the production, use, or existence of radioactive materials under a specific set of conditions. Such evaluation customarily includes a physical survey of the disposition of land, materials, and equipment, measurements or estimates of the levels of radiation that may be involved, and a sufficient knowledge of processes affecting these materials to predict hazards resulting from unexpected or possible changes in land, materials, or equipment.

radionuclide—An unstable element that decays or disintegrates spontaneously, emitting radiation.

real-time radiography—A nondestructive test method whereby an image is produced electronically, rather than on film, so that very little lag time occurs between the item being exposed to radiation and the resulting image.

Record of Decision (ROD)—A concise public document that records a Federal agency's decision(s) concerning a Proposed Action for which the agency has prepared an EIS. The ROD is prepared in accordance with the requirements of the Council on Environmental Quality NEPA regulations (10 CFR 1021.315 and 40 CFR 1505.2). A ROD identifies the alternatives considered in reaching the decision, the decision made, the environmentally preferable alternative(s), factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not. (Also see environmental impact statement.)

region of influence (ROI)—A site-specific geographic area in which the principal direct and indirect effects of actions are likely to occur.

release fraction—The portion of the total inventory of radioactivity that could be released to the atmosphere in a given accident.

rem (roentgen equivalent man)—Is a unit of radiation dose equivalent. The dose equivalent in rems equals the absorbed dose in rads multiplied by the appropriate quality factor (1 rem is equal to 0.01 sievert). (See absorbed dose, gray, quality factor, and sievert.)

remote-handled waste—In general, refers to radioactive waste that must be handled at a distance to protect workers from unnecessary exposure (waste with a dose rate of 200 millirem per hour or more at the surface of the waste package). (See contact-handled waste.)

Resource Conservation and Recovery Act (RCRA)—A law that gives EPA and authorized states the authority to control hazardous waste from “cradle to grave” (i.e., from the point of generation to the point of ultimate disposal), including its minimization, generation, transportation, treatment, storage, and disposal. RCRA also sets forth a framework for the management of nonhazardous solid wastes. (Also see hazardous waste and solid waste.)

restricted airspace—An area of airspace in which the controlling authority has determined that air traffic must be restricted, if not continually prohibited. It denotes the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles.

risk—The probability of a detrimental effect on life, health, property, and/or the environment from exposure to a hazard. Risk is often expressed quantitatively as the probability of an adverse event occurring multiplied by the consequence of that event (i.e., the product of these two factors).

roentgen—A unit of exposure to ionizing x or gamma radiation equal to or producing one electrostatic unit of charge per cubic centimeter of air. (See *gamma radiation* and *x-rays*.)

runoff—That portion of precipitation, snow melt, or irrigation water that moves over the land surface as a sheet or channelized flow.

sanitary landfill—As defined in this EIS, a disposal facility that accepts nonhazardous and nonradioactive industrial waste. (Also see industrial waste.)

saturated zone—The area below the water table where all spaces (fractures and rock pores) are completely filled with water.

scientific notation—A notation adopted by the scientific community to deal with very large and very small numbers. Scientific notation uses a number times 10 and either a positive or negative exponent to show how many places to the left or right the decimal place has been moved. For example, in scientific notation, 120,000 would be written as 1.2×10^5 , and 0.000012 would be written as 1.2×10^{-5} .

seep—A spot where groundwater discharges onto the land surface, often forming the source of a small stream.

seismicity—The study of the worldwide distribution of earthquakes; primarily related to location, size, and probability of occurrence.

shielding—Any material or obstruction used to absorb radiation in order to protect personnel or equipment.

sievert (Sv)—The SI (International System of Units) unit of radiation dose equivalent. The dose equivalent in sieverts equals the absorbed dose in grays multiplied by the appropriate quality factor (1 sievert is equal to 100 rem). (See absorbed dose, gray, quality factor, rad, and rem.)

silt—A sedimentary material consisting of fine mineral particles, intermediate in size between sand and clay. In general, soils categorized as silt show greater rates of erosion than soils categorized as sand.

solid waste—1. In general, solid wastes are nonliquid, nonsoluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues. 2. For purposes of RCRA regulation, solid waste is any garbage; refuse; sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and other discarded material. Solid waste includes solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved material in domestic sewage or irrigation return flows or industrial discharges that are point sources subject to permits under Section 402 of the Clean Water Act. Finally, solid waste does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act. A more detailed regulatory definition of solid waste can be found in 40 CFR 261.2 and 6 NYCRR 360. (Also see hazardous waste and Resource Conservation and Recovery Act.)

source term—The amount of a specific pollutant (e.g., chemical, radionuclide) emitted or discharged to a particular environmental medium (e.g., air, water) from a source or group of sources. It is usually expressed as a rate (i.e., amount per unit time).

special nuclear material (SNM)—SNM is (1) plutonium, uranium-233, uranium enriched in isotopes of uranium-233 or -235, or any other material that the U.S. Nuclear Regulatory Commission determines to be SNM, or (2) any material artificially enriched by any of these radioactive materials.

special use airspace—Airspace where activities must be confined because of their nature or where limitations are imposed upon aircraft operations that are not part of those activities, or both. This airspace includes restricted airspace, military operations areas, and controlled firing areas.

spent nuclear fuel—Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated.

stabilization—Treatment of waste or a waste site to protect the biosphere from contamination.

stakeholder—Any person or organization with an interest in or affected by future activities impacting cleanup of the site. Stakeholders may include representatives from Federal and state agencies, Congress, American Indian Tribal governments, unions, educational groups, industry, environmental groups, other groups, and members of the general public.

stochastic (effects)—Effects that occur by chance. In the radiation protection context, the main stochastic health effects from exposure to high levels of radiation are cancer and genetic effects.

storage (waste)—The collection and containment of waste in a retrievable manner, requiring surveillance and institutional control, as not to constitute disposal.

storage facility (RCRA)—A building used for storing radioactive or hazardous wastes for greater than 90 days.

subcritical experiments—Subcritical experiments are performed with special nuclear material (for example, plutonium) in a manner that prevents the material from achieving a nuclear explosion. The experiments are designed to improve current knowledge of the dynamic properties of new or aged nuclear weapons parts and materials and to assess the effects of new manufacturing techniques on weapon performance. Subcritical experiments can vary any or all factors that influence criticality (mass, density, shape, volume, concentration, moderation, reflection, neutron absorption, enrichment, and interactions). Because there is no nuclear explosion, subcritical experiments are consistent with the U.S. nuclear testing moratorium.

succession—Relatively orderly, predictable, and progressive replacement of one plant community (called a stage) by another until a relatively stable climax community occupies the site (e.g., abandoned farm field to mature forest).

sump—A pit or reservoir serving as a drain or receptacle for liquids.

tectonic—Relating to the deformation of the crust of the Earth.

test bed—A test bed is an area that includes physical structures or designated terrain where tests and experiments are conducted.

transient, noncommunity water system—regularly serves at least 25 individuals, but not the same individuals, for more than 60 days per year. For example, a rest area, campground or restaurant with less than 25 employees on its own water supply is considered a transient water system.

transloading—Transfer of material at an intermodal transfer facility from one packaging to another for purposes of continuing the movement of the material in commerce.

transuranic—Refers to any artificially made, radioactive element whose atomic number is higher than that of uranium (atomic number 92), including neptunium, plutonium, americium, and curium.

transuranic (TRU) waste—Radioactive waste containing alpha particle-emitting radionuclides having an atomic number greater than 92 (the atomic number of uranium) and half-lives greater than 20 years, in concentrations greater than 100 nanocuries per gram.

tritium—A beta-emitting radioactive isotope of hydrogen whose nucleus contains one proton and two neutrons. Because it is chemically identical to natural hydrogen, tritium can easily be taken into the body by any ingestion pathway. The symbols for tritium are T and ^3H ; the latter symbol is more frequently encountered.

vadose zone (unsaturated zone)—The zone between the land surface and the water table (saturated zone); also called the zone of aeration.

waste acceptance criteria—A document that establishes NNSA/NSO waste acceptance criteria. The document provides the requirements, terms, and conditions under which NNSS accepts LLW and MLLW for disposal. It includes requirements for the generator's waste certification program, characterization, traceability, waste form, packaging, and transfer. The criteria apply to radioactive waste received at the NNSS Area 3 Radioactive Waste Management Site and Area 5 Radioactive Waste Management Complex for storage or disposal.

waste characterization—The identification of waste composition and properties by reviewing process knowledge, nondestructive examination, nondestructive assay, or sampling and analysis. Characterization provides the basis for determining appropriate storage, treatment, handling, transportation, and disposal requirements.

waste generator—An individual, facility, corporation, government agency, or other institution that produces waste material for certification, treatment, storage, or disposal.

wetlands—An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in those conditions, including swamps, marshes, bogs, and similar areas.

wind rose—A circular diagram showing, for a specific location, the percentage of the time the wind is from each compass direction. A wind rose is used in assessing consequences of airborne releases and shows the frequency of different wind speeds for each compass direction.

worker—Any worker whose day-to-day activities are controlled by process safety management programs and a common emergency response plan associated with a facility or facility area. This definition includes any individual within a facility/facility area who would participate in or support activities required for implementation of the alternatives.

x-rays—Penetrating electromagnetic radiation with a wavelength much shorter than that of visible light. X-rays are identical to gamma rays, but originate outside the nucleus, either when the inner orbital electrons of an excited atom return to their normal state or when a metal target is bombarded with high-speed electrons. (See *electron, gamma radiation, and nucleus.*)

zeolite—Any of various hydrous silicates utilized for their adsorbent and catalytic properties. Inorganic ion-exchange materials used for water purification or water softening are often zeolites.