

## GLOSSARY OF TERMS

alluvial fan	An outspread, gently sloping mass of alluvium deposited by a stream.
alluvium	A general term for clay, silt, sand, gravel, or similar material that is not compacted and has been deposited in fairly recent geologic time by streams, rivers, or floods.
anisotropic	Having some physical property that varies with direction.
Antler Orogeny	A mountain building episode that extensively deformed Paleozoic rocks of the Great Basin in Nevada during the late Devonian and early Mississippian time.
aquifer	A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield quantities of water to wells and springs.
aquitard	A geologic formation, group of formations, or part of a formation through which virtually no water moves.
argillite	A compact rock, derived from either mudstone or shale, that has undergone a somewhat higher degree of induration than mudstone or shale but is less clearly laminated than shale and without its fissility, and that lacks the cleavage distinctive of slate.
andesite	A dark colored, fine-grained, extrusive igneous rock.
ash	Pyroclastic material less than 4.0 mm in diameter. This term refers to both unconsolidated detritus and the consolidated deposit.
ash-fall tuff	(1) A tuff deposited by volcanic ash settling out of the atmosphere and forming a blanketing deposit of relatively uniform thickness regardless of the underlying topography. (2) A deposit of volcanic ash resulting from such a fall and lying on the ground surface.
ash-flow tuff	A tuff deposited by a volcano-derived hot density current. It can be either welded or unwelded and often fills in channels making the thickness of the resulting deposit a function of the underlying topography.
bar	A measurement of pressure, one bar being approximately equal to standard sea level atmospheric pressure, or 14.7 pounds per square inch.

basalt	A dark to medium dark igneous rock usually formed from lava flows and composed chiefly of calcic plagioclase and clinopyroxene minerals in a glassy or fine-grained ground mass.
basement rock	Undifferentiated rocks that underlie the stratified rocks of interest in an area.
Basin and Range	Physiographic province in the southwest United States characterized by a province series of tilted fault blocks forming longitudinal, asymmetric ridges or mountains and broad, intervening basins.
Basin-Range faulting	Faulting characterized by normal (extensional) fault movements. Regional geologic structure dominated by generally subparallel fault-block mountains separated by broad alluvium-filled basins.
breccia	Rock consisting of sharp fragments cemented together or embedded in a fine-grained matrix.
bulk modulus	A modulus of elasticity which relates a change in volume to the hydrostatic state of stress. It is the reciprocal of elasticity.
byproduct material	Any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material <u>and</u> the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.
caldera	A volcanic collapse structure, generally on the order of tens of kilometers in diameter, formed during the eruption of volumetrically large (tens to hundreds of cubic kilometers of rock) ash-flow and ash-flow tuff deposits.
caliche	A term applied broadly in the southwest United States to a reddish-brown to buff or white calcareous material of secondary accumulation, commonly found in layers on or near the surface of stony soils of arid and semiarid regions, but also occurring as a subsoil deposit in subhumid climates. It is composed largely of crusts of soluble calcium salts in addition to such materials as gravel, sand, silt, and clay. Caliche appears to form by a variety of processes, e.g. capillary action, in which soil solutions rise to the surface and on evaporation deposit their salt content on or in the surface materials.
Cambrian	The oldest of the periods of the Paleozoic Era, which lasted from 570 million to 500 million years ago.

carbonate	A sediment formed by the organic or inorganic precipitation from aqueous solution of carbonates of calcium, magnesium, or iron.
carbonate rocks	A rock consisting chiefly of carbonate minerals, such as limestone and dolomite.
Cenozoic	The latest of the eras into which geologic time, as recorded by stratified rocks of the earth's crust, is divided; this era is considered to have begun about 65 million years ago.
clastic	Pertaining to a rock or sediment composed principally of broken fragments that are derived from pre-existing rocks or minerals and that have been transported some distance from their places of origin.
colluvium	A general term applied to the accumulation of loose incoherent soil and rock material at the base of a slope.
conceptual model	A physical description of a system devised to show property variations as based on field and laboratory measurements and best technical judgments.
conglomerate	A sedimentary rock composed of rounded fragments of pebble to gravel size cemented in a finer-grained matrix.
containment	The confinement of radioactive waste within a designated boundary.
cytoplasmic inheritance	A property of genes located in mitochondria or chloroplasts (or possibly other extranuclear organelles).
dacite	A fine-grained extrusive igneous rock with the same general composition as andesite but with less calcic feldspar.
Devonian	The period of the Paleozoic Era lasting from 408 to 360 million years ago.
dike	A tabular body of igneous rock that cuts across the structure of adjacent rocks or cuts massive rocks.
design earthquake	A hypothetical earthquake against which protective measures are taken, commonly used to design seismic protection features in engineered facilities.
earthquake	A sudden motion or trembling in the earth caused by the release of slowly accumulated strain.

en echelon	Geologic features that are in an overlapping or staggered arrangement (e.g., faults). Each is relatively short, but collectively they form a linear zone in which the strike of the individual features is oblique to that of the zone as a whole.
eolian	Term applied to deposits arranged by the wind.
epicenter	The point on the earth's surface directly above the exact subsurface location (hypocenter) of an earthquake
evapotranspiration	Loss of water from a land area through transpiration of plants and evaporation from the soil.
extrusive	Igneous rock that has been erupted onto the surface of the earth.
fault	A fracture or zone of fractures along which there has been displacement of the sides relative to one another, parallel to the fracture or zone of fractures.
fault block	A structural unit in the earth's crust that is formed by faulting and is bounded completely or in part by faults. This structure behaves essentially as a unit during tectonic activity.
flow breccia	A breccia that is formed contemporaneously with the movement of a lava flow; the cooling crust becomes fragmented while the flow is in motion and is either incorporated into the flow, or falls in front of the moving flow and is overtaken.
flow unit	A group of stacked pyroclastic deposits that were emplaced as separate ash-flow tuffs during the same or closely associated eruptive event(s).
fluvial	Of or pertaining to rivers; growing or living in a stream or river; produced by the action of a stream or river.
formation	The basic rock-stratigraphic unit in the local classification of rocks. It consists of a body of rock generally characterized by some degree of internal lithologic homogeneity or distinctive features.
fracture	A general term for any break in a rock, whether or not it causes displacement, due to mechanical failure by stress. Fractures include cracks, joints, and faults.
gene amplification	Refers to the production of additional copies of a chromosome sequence, found as intrachromosomal or extrachromosomal DNA.

genomic imprinting	Describes a change in a gene that occurs during passage through a sperm or egg with the result that the paternal and maternal alleles have different properties in the very early embryo. May be caused by methylation of DNA.
genotype	The genetic constitution of an organism.
geologic setting	The geologic, hydrologic, and geochemical systems of the region in which a geologic repository operations area is or may be located.
geomorphology	The branch of geology that deals with the general configuration of the earth's surface; specifically the study, classification, description, nature, origin, and development of landforms.
graben	A usually elongated depression of the earth's crust between two parallel faults.
gneiss	A foliated rock formed by regional metamorphism, in which bands of granular materials alternate with bands of minerals with elongate prismatic habit.
granite	A medium- to coarse-grained intrusive igneous rock consisting primarily of feldspar and quartz.
Great Basin	A subdivision of the Basin and Range physiographic province, located in southern Nevada in a broad desert region. The Yucca Mountain site is located in the Great Basin.
high-level waste	The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.
historical seismicity	Earthquakes that occurred during recorded history, including those reported before the existence of seismographs and those recorded by seismographs.
Holocene	An epoch of the Quaternary Period, from the end of the Pleistocene to the present.

host rock	The rock in which the radioactive waste will be emplaced; specifically, the geologic materials that will directly encompass and will be in close proximity to the underground repository.
hypocenter	The focus or specific point at which initial rupture occurs in an earthquake.
igneous activity	The emplacement (intrusion) of molten rock (magma) into material in the earth's crust or the expulsion (extrusion) of such material onto the earth's surface or into its atmosphere or surface water.
igneous rock	A rock that solidified from molten or partially molten material (i.e., from magma). Igneous rock is one of the three main classes into which rocks are divided, the others being metamorphic rock and sedimentary rock.
ignimbrite	A silicic volcanic rock forming thick, massive, compact, lavalike sheets that cover a wide area. The rock is chiefly a rhyolitic tuff and the deposits are believed to have been produced by eruption of dense clouds of incandescent volcanic glass in a semimolten or viscous state from groups of fissures.
imbricate	A tectonic structure displayed by a series of nearly parallel faults, characterized by rock slices, sheets, plates, blocks, or wedges that are approximately equidistant and have the same displacement and that are all steeply inclined in the same direction.
indurated	Used to describe a rock or soil hardened or consolidated by pressure, cementation or heat.
intermontane	Situated between or surrounded by mountains, mountain ranges, or mountainous regions.
internal drainage	Surface drainage in which the water does not reach the ocean, such as drainage toward the central part of an interior basin.
intrusive	Of or pertaining to the emplacement of magma in preexisting rock.
latite	A porphyritic extrusive rock with nearly equal amounts of plagioclase and potassium feldspar, little or no quartz, and a fairly finely crystalline groundmass.
liquefaction	In cohesionless soil, the transformation from a solid to a liquid as a result of increased pore pressure and reduced effective stress.

lithology	The study of rocks. Also the description of a rock on the basis of such characteristics as structure, color, mineral composition, grain size, and arrangement of its component parts.
lithophysae	Bubble-like structures in rocks, generally hollow, composed of concentric shells of finely crystalline alkali feldspar, quartz, and other minerals.
lithostatic pressure	The vertical pressure at a point in the earth's crust, equal to the pressure caused by the weight of a column of the overlying rock or soil.
low-level waste	Waste that contains radioactivity and is not classified as high-level, transuranic, or spent nuclear fuel or byproduct material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may also be classified as low-level waste, provided the concentration of transuranic is less than 100 nanocuries per gram.
magma	Naturally occurring mobile rock material, generally within the earth and capable of extrusion and intrusion, from which igneous rocks are formed through solidification and related processes.
magmatism	The development and movement of magma within the earth.
magnitude	The measure of the strength of an earthquake; related to the energy released in the form of seismic waves. Magnitude is quantified by a numerical value on the Richter scale.
metamorphism	The mineralogic, chemical, and structural adjustment of solid rocks to physical and chemical conditions imposed at depth below the surface zones of weathering and cementation which differ from the conditions under which the rocks were formed.
miogeosyncline	A geosyncline in which volcanism is not associated with sedimentation.
Mississippian	The first period of the Carboniferous Era lasting from 360 to 320 million years ago.
mixed low-level radioactive and hazardous waste	Mixed low-level waste is defined as waste that satisfies the definition of low-level radioactive waste in the Low-Level Radioactive Waste Policy Amendments Act of 1985 and contains hazardous waste that either (1) is listed as a hazardous waste in Subpart D of 40 CFR Part 261 or (2) causes the low-level waste to exhibit any of the hazardous waste characteristics identified in Subpart C of 40 CFR Part 261.

model	A conceptual description and associated mathematical representation of a system, component, or condition. It is used to predict changes in the system, component, or condition in response to internal or external stimuli as well as changes over time and space. An example is a hydrologic model to predict ground-water travel or radionuclide transport from the waste emplacement area to the accessible environment.
mosaicism	The condition in which tissues of genetically different types occur in the same organism.
natural barrier	The physical, mechanical, chemical, and hydrologic characteristics of the geologic environment that, individually and collectively, act to minimize or preclude radionuclide transport.
near field	The region where the natural geohydrologic system has been significantly perturbed by the excavation of the repository and the emplacement of the waste.
normal fault	A fault in which the hanging wall (the strata above the fault plane) appears to have moved down relative to the foot wall (the strata below the fault plane). The angle of the fault is usually 45 to 90 degrees measured from the horizontal.
orogeny	The process of forming mountains, particularly by folding and thrusting.
Paleozoic	The era of geologic time, from the end of the Precambrian to the beginning of the Mesozoic or from about 570 million to 225 million years ago.
phenocryst	A term applied to any large, conspicuous crystal in an igneous rock.
phenotype	The appearance or other characteristics of an organism, resulting from the interaction of its genetic constitution with the environment.
physiography	The descriptive study of landforms as opposed to geomorphology, which is the interpretive study of landforms.
physiographic	A region in which all parts are similar in geologic structure and climate province and which consequently have a unified geomorphic history.
porphyritic	A texture of igneous rock in which large crystals are set in a finer groundmass that may be crystalline or glassy or both.
Proterozoic	The entire Precambrian period.



Precambrian	All geologic time, and its corresponding rocks, that elapsed before the beginning of the Paleozoic Era (the Paleozoic Era began about 570 million years ago).
pumice	A light-colored, cellular, glassy rock commonly having the composition of rhyolite.
pyroclastic	Pertaining to clastic rock (rock composed of fragments of preexisting material) material formed by volcanic explosion or aerial expulsion from a volcanic vent. Also pertaining to rock texture of explosive origin.
quartzite	Used to refer to either sedimentary or metamorphic rocks composed chiefly of quartz. In sedimentary petrology, a very hard but unmetamorphosed sandstone, consisting chiefly of quartz grains that have been so completely and solidly cemented with secondary silica that the rock breaks across or through the grains rather than around them. In metamorphic petrology, a granoblastic metamorphic rock consisting mainly of quartz and formed by recrystallization of sandstone or chert.
Quaternary faults	Faults that formed or experienced movement during the Quaternary Period.
Quaternary Period	The second part of the Cenozoic Era (after the Tertiary), beginning about 1.8 million years ago and extending to the present.
retardation	The process that causes the time required for a given radionuclide to move between two locations to be greater than the ground-water travel time because of physical and radionuclide interactions between the radionuclide and the geohydrologic unit through which the radionuclide travels.
recurrence interval	The average time interval between occurrences of a hydrologic or geologic event of a given or greater magnitude.
ring-fracture zone	A steep-sided fault pattern cylindrical in outline and associated with caldera subsidence.
rhyolite	A group of extrusive igneous rocks, generally porphyritic and exhibiting flow texture with crystals of quartz and alkali feldspar in a glassy to cryptocrystalline groundmass.
Richter magnitude	See "Richter scale".

Richter scale	A scale for measuring the energy released by an earthquake. It was derived in 1935 by the seismologist C.F. Richter.
sandstone	A sedimentary rock composed of cemented or otherwise compacted material of sand size particles predominantly of quartz but may contain other mineral components.
scoria	Pyroclastic ejecta of basic composition characterized by a high content of vesicles (cavities) and a texture that is part glassy and part crystalline.
seismic	Pertaining to, characteristic of, or produced by earthquakes or earth vibrations.
seismicity	The occurrence of earthquakes or the spatial distribution of earthquake activity. Also the phenomenon of earth movement.
shale	A sedimentary rock in which the particles are of clay size.
silicic	A chemical classification of igneous rocks in which silica ( $\text{SiO}_2$ ) exceeds 66%.
siliceous	Of or pertaining to silica ( $\text{SiO}_2$ ) in various forms.
siltstone	A sedimentary rock in which the constituent particles are predominantly of silt size.
slickenside	Polished or striated (scratched) surface that results from friction along a fault plane.
source material	Uranium, thorium, or any other material which is determined by NRC to be source material; or ores containing one or more of the foregoing materials in concentrations the NRC may by regulation determine from time to time.
special nuclear material	Plutonium, uranium enriched in the isotope 233 or 235, and any other material which NRC determines to be special nuclear material, but does not include source material.
specific storage	The volume of water yielded from a unit volume of a confined aquifer per unit decline hydraulic head.
specific yield	The ratio of the volume of water that a given mass of saturated rock or soil will yield by gravity to the volume of that mass. This ratio is stated as a percentage.

spent nuclear fuel	Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.
strike-slip faulting	A fault in which the net slip is horizontal or parallel to the strike of the fault plane.
strike	The direction or trend of a structural surface (e.g., a bedding or fault plane) as it intersects the horizontal.
storativity	The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head.
surface facilities	All repository operations and support facilities located on the surface of the site.
talus	Loose rock fragments of any size or shape derived from, and lying at the base of, a steep slope.
tectonic	Of, or pertaining to, the forces involved in tectonics or the resulting structures or features.
tectonics	A branch of geology dealing with the broad architecture of the outer part of the earth; that is, the regional assembling of structural or deformational features, a study of their mutual relations, their origin, and their evolution.
tephra	A collective term for all clastic volcanic materials which are ejected through the air from a crater, includes volcanic dust and ash, cinders, lapilli, scoria, pumice, bombs and blocks.
Tertiary	The earlier of the two geologic periods that make up the Cenozoic Era, extending from 65 million to 1.8 million years ago.
thrust fault	A fault with a dip of 45 degrees or less in which the hanging wall (the rock mass above the fault plane) appears to have move upward relative to the foot wall (the rock mass below the fault plane).
transmissivity	The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient. In the English Engineering system, transmissivity values are given in gallons per minute through a vertical section of an aquifer one foot wide and extending the full saturated height of an aquifer under a hydraulic gradient of 1; in the International System,

	transmissivity is given in cubic meters per day through a vertical section of an aquifer one meter wide and extending the full saturated height of an aquifer under a hydraulic gradient of 1.
transposable elements	Refers to the movement of a DNA sequence to a new site in the genome. The DNA sequence that is transposable is referred to as a transposon.
transuranic materials	An element with an atomic number greater than that of uranium.
transuranic waste	Without regard to source or form, waste containing more than 100 nanocuries (37 becquerels) of alpha-emitting transuranic isotopes, with half-lives greater than twenty years, per gram of waste, excluding (1) high-level waste, (2) wastes that DOE and EPA have determined do not need the degree of isolation required by 40 CFR Part 191, or (3) wastes that the NRC has approved for disposal on a case-by-case basis with 10 CFR Part 61.
tuff	A compacted pyroclastic deposit of volcanic ash and dust that may contain rock and mineral fragments incorporated during eruption and transport.
uniparental disomy	A form of uniparental inheritance, when the genotype of only one parent is inherited and that of the other parent is permanently lost. Usually it is the mother whose genotype is inherited in uniparental inheritance.
vitrophyre	Any porphyritic igneous rock with a glassy groundmass.
vitric	Term describing igneous material that is characteristically glassy (i.e., contains more than 75% glass).
volcanism	The process by which magma and its associated gases rise into the crust of the earth and are extruded onto the earth's surface and into the atmosphere.
vug	A small cavity in a vein or in rock, usually lined with crystals of different mineral composition from the enclosing rock.

welded tuff

Indurated volcanic ash in which the constituent glassy shards and other fragments have become welded together, apparently while still hot and plastic after deposition. Where the distinction between nonwelded and partly welded tuff is necessary, the boundary should be placed at or close to that point where the deformation of glassy fragments becomes visible. The transition from partly to densely welded tuff is one of progressive loss of pore space accompanied by an increase in the deformation of the shards and pumiceous fragments.

zeolites

A group of hydrous aluminosilicate minerals containing sodium, calcium, barium, strontium, and potassium, and characterized by their ease of exchange of these ions.