Term
3-Dimensional log
A' electrode Definition: One of the current-emitting electrodes of a resistivity-logging system (A); the current return electrode is labeled B. Sometimes referred to as C1 and C2
Accuracy Definition: Refers to closeness of a measurement to the true value.
Acoustic impedance Definition: Reflects the ability of a boundary to reflect seismic energy. It is the contrast of density multiplied by velocity across the boundary. A measure of the seismic inertia of the medium.
Acoustic log Definition: Also called sonic log; a record of changes in the character of sound waves as they are transmitted through liquid-filled rock; a record of the transit time (t) is the most common; amplitude and the full acoustic-wave form also are recorded.
Acoustic televiewer log Definition: A record of the amplitude of high-frequency acoustic pulses reflected by the borehole wall; provides location and orientation of bedding, fractures, and cavities.

Term
Acoustic wave Definition: A sound wave transmitted through material by elastic deformation.
Activation log Definition: Also called neutron-activation logs; a record of radiation from radionuclides that are produced in the vicinity of a well by irradiation with neutrons; the short half-life radioisotopes usually are identified by the energy of their gamma radiation or decay time.
Alluvium Definition: A general term for unconsolidated material (e.g. clay, silt, sand, gravel) deposited from running water. Often a sorted or semi-sorted sediment in the bed of a stream or on its floodplain or delta. The deposit may be in the form of an alluvial fan.
Amplitude Definition: The maximum departure of a wave from the average value.
Analog recording Definition: Data are represented as a continuous record of physical variables instead of discrete values, as in digital recording.
Anisotropic Definition: Having a physical property, which varies with direction.
Annulus

Term
Definition: The space between the drill pipe or casing and the wall of the drill hole; in rocks saturated with hydrocarbons, the annulus is the transition interval between the invaded zone and the uncontaminated zone.
Anomaly Definition: Refers to deviation from uniformity in a physical property.
API unit Definition: The American Petroleum Institute (API) has established test pits for calibrating neutron and gamma logs. The API neutron unit is defined as 1/1,000 of the difference between electrical zero and the logged value opposite the Indiana limestone in the calibration pit that has an average porosity of 19 percent. The API gamma unit is defined as 1/200 of the deflection between intervals of high and low radioactivity in the calibration pit.
Apparent resistivity/conductivity Definition: The resistivity of a homogeneous isotropic ground that would give the same voltage/current or secondary/primary field ratios as observed in the field with resistivity or EM methods. The apparent conductivity is the reciprocal of the apparent resistivity.
Aquifer Definition: Rocks or unconsolidated sediments that are capable of yielding a significant amount of water to a well or a spring.
Aquitard

Term
Definition: Geologic formation/s of low hydraulic conductivity, typically saturated, but yielding a limited amount of water to wells. Also referred to as a confining unit.
Archie's Law Definition: An empirical relationship linking formation resistivity (rt), formation water resistivity (rw) and porosity. The form of the relationship is rt = a rw -m where a and m are experimentally determined constants.
Atomic number Definition: The number of protons in the nucleus of an atom equal to the number of electrons in a neutral atom. Acronym: Z
Atomic weight Definition: The total number of protons and neutrons in the nucleus of an atom.
Attenuation, attenuate Definition: A reduction in energy or amplitude caused by the physical characteristics of a transmitting system.
Automatic Gain Control Definition: A process for increasing the amplitude of a trace with time, thus making all events on the trace appear to be of approximately the same amplitude. Note that this process will expand the amplitudes even if no data are present. Various window lengths are used; the appearance of the data may be greatly affected by the window used in the calculation. Acronym: AGC

Term
Back-up curve Definition: A curve on the analog record that displays log data on a new scale when deflections on the main curve exceed the width of the paper; usually displayed with a different pattern or color.
Bedrock Definition: A general term referring to rock that underlies unconsolidated material.
Borehole-compensated Definition: Probes designed to reduce the extraneous effects of the borehole and of probe position are called borehole-compensated.
Borehole television or video Definition: A downhole television camera; see acoustic-televiewer definition.
Bottom-hole temperature Definition: The bottom-hole temperature (BHT) usually is measured with maximum recording thermometers attached to a logging probe.
Bouguer correction Definition: The process of correcting gravity data for the mass of the rock between a given station and its reference (base) station. Application of the Bouguer correction to the data set, as well as corrections for latitude, topography, meter drift and elevation, yields

Term
the Bouguer anomaly.
Brute stack Definition: A common midpoint stack with only preliminary static corrections (often none) and preliminary normal-moveout corrections (often constant velocity). This stack is often done by field computers to verify the existence of actual reflections.
Bulk density Definition: Bulk density is the mass of material per unit volume; in logging, it is the density, in grams per cubic centimeter, of the rock with pore volume filled with fluid.
Bulk modulus Definition: A modulus of elasticity, relating change in volume to the hydrostatic state of stress. It is the reciprocal of compressibility.
Calibration Definition: Determination of the log values that correspond to environmental units, such as porosity or bulk density; calibration usually is carried out in pits or by comparison with laboratory analyses of core.
Caliper log Definition: A continuous record of hole diameter, usually made with a mechanical probe having from one to six arms.
Casing-collar locator

Term
Definition: An electromagnetic device (CCL) that usually is run with other logs to record the location of collars or other changes in casing or pipe.
Cement bond log Definition: An acoustic amplitude log that is used to determine the location of cement behind the casing and, under some conditions, the quality of the bonding to casing and rock.
Cementation factor Definition: The cementation exponent (m) in Archie's equation relating formation-resistivity factor and porosity; cementation factor as relates to many aspects of pore and grain geometry that affect permeability.
Centralizer Definition: A device designed to maintain a probe in the center of a borehole.
Chargeability Definition: The normalized (using the primary voltage) area under an induced polarization (IP) decay curve, between two times, after the transmitted current is stopped in a time domain survey. Usually expressed in millivolt-seconds per volt.
Coherence Definition: A measure of the similarity of two oscillating functions.
Collimation

Term
Definition: The technique for forcing radiation, like gamma photons, into a beam.
Complex conductivity Definition: See Complex resistivity
Complex number Definition: Comprised of a real and imaginary part.
Complex resistivity Definition: A geophysical effect, also the basis of the CR method, in which polarization within the medium results in the voltage and applied current being out of phase - that is, their ratio is complex. Also known as spectral IP. Induced polarization (IP) is one form of complex resistivity. Acronym: CR
Compressibility Definition: The relative volume reduction that geological material can undergo when a force is applied or water is removed from the vicinity by pumping.
Compressional wave Definition: Compressional acoustic waves (P) are propagated in the same direction as particle displacement; they are faster than

Term
shear waves and are used for measuring acoustic velocity or transit.
Compton scattering Definition: The inelastic scattering of gamma photons by orbital electrons; Compton scattering is related to electron density and is a significant process in gamma-gamma (density) logging.
Conductance Definition: The product of conductivity and thickness [Siemens].
Conduction currents Definition: Electrical current resulting from the movement of free ges (contrast with displacement current).
Conductivity (electrical) Definition: The ability of a material to conduct electrical current. In isotropic material, it is the reciprocal of resistivity. Units are Siemens/m.
Confining unit
Correlation Definition: Determination of the position of stratigraphically equivalent rock units in different wells, often done by matching the acter of geophysical logs; also the matching of variables, such as log response and core analysis.

Term
Cross-hole Definition: Geophysical methods carried out between boreholes (see also tomography).
Crossplot Definition: A term used in log analysis for a plot of one parameter versus another, usually two different types of logs. Useful for the identification of lithology.
Cultural environment Definition: The part of the environment which represents man-made features (e.g. roads, buildings, canals, bridges) as opposed to natural features.
Cultural Noise
Curie Definition: The quantity of any radionuclide that produces 3.70 x 1010 disintegrations per second.
Current channeling/gathering Definition: Channeling is a restriction of current flow due to an insulating barrier or narrowing of a conductor. Current gathering is a concentration of current in a locally, more conductive zone. The disproportionate influence of lakes and swamps on VLF surveys is a well-known example.

Term
Current density Definition: A measure of current flow through a given (oriented) area [Amperes/ m2].
Cycle skip Definition: In acoustic-velocity logging, cycle skips are caused by only one of a pair of receivers being triggered by an arriving wave, which causes sharp deflections on the log.
Dead time Definition: In nuclear logging, dead time is the amount of time required for the system to be ready to count the next pulse; pulses occurring during dead time are not counted.
Decay Definition: In nuclear physics, the process of disintegration of an unstable radioisotope by the spontaneous emission of charged particles or photons.
Decentralize Definition: Forcing a logging probe against one side of the drill hole.
Deconvolution Definition: A data processing technique applied to seismic reflection data to improve the detection and resolution of reflected events.

Term
The process reverses the effect of linear filtering processes (convolution) that have been applied to the data by recording instruments or other processes.
Dense-non-aqueous-phase liquids Definition: Organic liquids that are more dense than water. They often coalesce in an immiscible layer at the bottom of a saturated geologic unit. Acronym: DNAPLs
Density log Definition: Also called gamma-gamma log; gamma photons from a radioactive source in the sonde are backscattered to a detector; the backscattering is related to the bulk density of the material around the sonde.
Departure curves Definition: Graphs that show the correction that may be made to logs for some extraneous effects, such as hole diameter, bed thickness, temperature, etc.
Depth of invasion Definition: Radial distance from the wall of the hole to which mud filtrate has invaded.
Depth of investigation Definition: See volume of investigation, also called radius or diameter of investigation.

Term
Depth reference or datum Definition: Zero reference for logs of a well; kelly bushing may be used if the rig is still on the well; ground level or top of casing is frequently used.
Depth section Definition: A cross section to which a velocity function has been applied, thus converting arrival times of reflections to depths.
Detector Definition: Can be any kind of a sensor used to detect a form of energy, but usually refers to nuclear detectors, such as scintillation crystals.
Deviation Definition: The departure in degrees between the drill hole or probe axis and vertical.
Diameter of investigation
Dielectric constant Definition: A measure of the ability of a material to store ge when an electric field is applied.
Dielectric permittivity

Term
Definition: Describes the ge separation or polarization in a medium.
Differential log Definition: A log that records the rate of change of some logged value as a function of depth; the differential log is sensitive to very small changes in absolute value.
Digital log Definition: A log recorded as a series of discrete numerical values (compare analog recording).
Dipmeter Definition: A multielectrode, contact-resistivity probe that provides data from which the strike and dip of bedding can be determined.
Dipole Definition: A pair of equal ges or poles of opposite signs.
Directional survey Definition: A log that provides data on the azimuth and deviation of a borehole from the vertical.
Dispersion Definition: A property of seismic surface waves in which their velocity (as well as their penetration into the subsurface) is dependent on their frequency. The basis of methods such as SASW in which seismic wave velocity is analyzed as a function of wave frequency.

Term
Displacement currents Definition: The movement of ge within a material by polarization, as opposed to the flow of free ions or electrons. Related to the applied electric field by the electric permittivity (dielectric constant).
Dual laterolog Definition: A focused resistivity log with both shallow and deep investigation; usually gamma, SP, and microfocused logs are run simultaneously.
Effective porosity Definition: The amount of interconnected pore space through which fluids can pass. Effective porosity is usually less than total porosity because some dead-end pores may be occupied by static fluid.
Elastic moduli (elastic constants) Definition: Elastic moduli specify the stress- strain properties of isotropic materials in which stress is proportional to strain. They include bulk and shear moduli.
Electric field Definition: A vector field describing the force on a unit electrical ge [newtons/coulomb = volts/meter].
Electrical logs

Term
Definition: Provide information on porosity, hydraulic conductivity, and fluid content of formations drilled in fluid-filled boreholes. This record is based on the dielectric properties (e.g., electrical resistivity) of the aquifer materials measured by geophysical devices lowered down boreholes or wells.
Electrode Definition: A piece of metallic material that acts as an electric contact with a non-metal. In chemistry, it refers to an instrument designed to measure an electrical response that is proportional to the condition being assessed (e.g. pH, resistivity).
Electromagnetic-casing inspection log Definition: The effects of eddy currents on a magnetic field are used to provide a record of the thickness of the casing wall.
Electromagnetic method Definition: A method which measures magnetic and/or electric fields associated with subsurface currents.
Electron volt Definition: The energy acquired by an electron passing through a potential difference of one volt (eV); used for measuring the energy of nuclear radiation and particles, usually expressed as million electron volts (MeV).
Epithermal neutron Definition: A neutron source emits fast neutrons that are slowed by moderation to an energy level just above thermal equilibrium, where they are available for capture; most modern neutron probes measure epithermal neutrons, because they are less affected by chemical composition than thermal neutrons.

Term
Equipotential map Definition: A plot in which points of equal hydraulic head are connected.
Fan shooting Definition: A seismic refraction technique where the sensors (geophones) are deployed on a segment of a circle centered on the seismic source. Variations in the time of arrival are caused by radial variations in the velocity structure. Could be used, for example, to search for low velocity anomalies caused by buried waste.
Ferrimagnetic Definition: Substances having positive and relatively large magnetic susceptibility as well as generally large hysteresis and remanence. This is due to the interaction of atoms and the coupling of magnetic moments aligned in opposition, which result in non-zero net moments. Ferrimagnetic minerals have this property.
Field Definition: That space in which an effect, such as gravity or magnetism, is measurable.
Field print Definition: A copy of a log obtained at the time of logging that has not been edited or corrected.
Filter cake

Term
Filtering Definition 1: The attenuation of a signal's components based on a measurable property (usually frequency). Filtering usually involves a numerical operation that enhances only a portion of the signal. Definition 2: Fluid passage through a material that retains particles or colloids above a certain size.
First reading Definition: The depth at which logging began at the bottom of the hole.
Flexural Waves Definition: Flexural waves occur in bars and refers to the flexing, or bending, of a bar. Thus they can be created in shafts by impacting the side of a shaft. The velocity of flexural waves depends on their wavelength.
Floaters
Flowmeter Definition: A logging device designed to measure the rate, and usually the direction, of fluid movement in a well; most are designed to measure vertical flow.
Fluid sampler Definition: An electronically controlled device that can be run on a logging cable to take water samples at selected depths in the well.

Term
Flushed zone Definition: The zone in the borehole wall behind the mudcake that is considered to have had all mobile native fluids flushed from it.
Focused log Definition: A resistivity log that employs electrodes designed to focus the current into a sheet that provides greater penetration and vertical resolution than unfocused logs.
Formation Definition: Used in well-logging literature in a general sense to refer to all material penetrated by a drill hole without regard to its lithology or structure; used in a stratigraphic sense, formation refers to a named body of rock strata with unifying lithologic features.
Formation-resistivity factor Definition: Formation factor (F) is the ratio of the electrical resistivity of a rock 100 percent saturated with water (Ro) to the resistivity of the water with which it is saturated (Rw). F = Ro/Rw.
Frequency domain Definition: In geophysics, refers to measurements analyzed according to their constituent frequencies. The usual alternative is time domain measurements.
Galvanic

Term
Definition: Describes geophysical techniques that require direct contact with the ground in order to pass current. The alternative is to induce currents in the earth.
Gamma Definition: The common unit of magnetic field intensity, equal to one nanoTesla (a Tesla is the SI unit). The Earth's magnetic field strength is about 50,000 gammas (g) in mid-latitudes.
Gamma-gamma log
Gamma log Definition: Also called gamma-ray log or natural-gamma log; log of the natural radioactivity of the rocks penetrated by a drill hole; also will detect gamma-emitting artificial radioisotopes (see spectral-gamma log).
Gamma ray Definition: A photon that has neither mass nor electrical ge that is emitted by the nucleus of an atom; measured in gamma logging and output from a source used in gamma-gamma logging.
Gamma-ray log
Geomagnetic field Definition: The Earth's magnetic field.

Term
Geophones Definition: Receivers used to record the seismic energy arriving from a source, in seismic geophysical methods.
Geophysical mapping Definition: Locating geophysical anomalies in space (as opposed to time, which is geophysical monitoring).
Geophysical monitoring Definition: Observing the change in a geophysical measurement with time.
Grain density Definition: Also called matrix density; the density of a unit volume of rock matrix at zero porosity, in grams per cubic centimeter.
Ground electrode Definition: A surface electrode used for SP and resistivity logging.
Ground penetrating radar Definition: A geophysical method in which bursts of electromagnetic energy are transmitted downwards from the surface, to be reflected and refracted by velocity contrasts within the subsurface. Also known as Ground Probing Radar. Acronym: GPR
Ground probing radar

Term
Guard log Definition: A type of focused resistivity log that derives its name from guard electrodes that are designed to focus the flow of current.
Half-life Definition: Radioactively, half-life is the time required for half of a given quantity of material to decay. Chemically, it is the time required for half of a given quantity of material to undergo a chemical reaction.
Imaging work station Definition: Consists of a microcomputer with a high-resolution color monitor and accompanying software which allows the manipulation, enhancement and visual display of digital data.
In-phase Definition: That part of a periodic signal that has zero phase shift with a reference signal. See also quadrature.
Induced magnetization Definition: Magnetization caused by an applied magnetic field. Contrast with remanent magnetization.
Induced polarization Definition: A geophysical effect whereby electrical ge is momentarily polarized within a material, usually a disseminated ore or a clay.

Term
This effect is the basis for the IP method, in which a decaying voltage due to this polarization is measured following the turn-off of the activating current in time domain surveying. See also complex resistivity. Acronym: IP
Induction (EM), induce Definition: The process, described by Faraday's Law, whereby a variable magnetic field generates an electric field (voltage) that, in the presence of a conductor, will produce electric currents.
Induction log Definition: A method for measuring resistivity or conductivity that uses an electromagnetic technique to induce a flow of current in the rocks around a borehole; can be used in nonconductive-borehole fluids.
Induction number Definition: A quantitative measure of the quality of a target for EM methods. The formulation varies for different targets but in general it involves the product of target conductivity, magnetic permeability, frequency of the transmitter and a cross-sectional dimension of the target. Dimensionless.
Interpolation Definition: A method to determine intermediate values from surrounding known values.
Interpretation Definition: Transforming geophysical measurements into subsurface structure. More general term than inversion.

Term
Interval transit time Definition: The time required for a compressional acoustic wave to travel a unit distance (t); transit time usually is measured by acoustic or sonic logs, in microseconds per foot, and is the reciprocal of velocity.
Invaded zone Definition: The annular interval of material around a drill hole where drilling fluid has replaced all or part of the native interstitial fluids.
Inversion, inverting Definition: The process of deriving a model of the subsurface that is consistent with the geophysical data obtained. Generally refers to a more specific methodology than interpretation.
Isotopes Definition: Atoms of the same element that have the same atomic number, but a different mass number; unstable isotopes are radioactive and decay to become stable isotopes.
Karst Definition: Topographic area which has been created by the dissolution of carbonate rock terrain. It is characterized by caverns, sinkholes, and the absence of surface streams.
Lag

Term
Definition: The distance a nuclear logging probe moves during one time constant.
Last reading Definition: The depth of the shallowest value recorded on a log.
Lateral log Definition: A multielectrode, resistivity-logging technique that has a much greater radius of investigation than the normal techniques, but requires thick beds and produces an unsymmetrical curve.
Laterolog Definition: A focused-resistivity logging technique; see also guard log.
Light-non-aqueous phase liquids Definition: Organic fluids that are less dense than water. They are capable of forming an immiscible layer that floats on the water table (e.g. petroleum hydrocarbons or other organic liquids). Also referred to as Floaters. Acronym: LNAPLs
Long normal log Definition: A resistivity log with AM spacing usually 64 in.; see normal logs.
M electrode

Term
Definition: The potential electrode nearest to the A electrode in a resistivity device.
Magnetic permeability Definition: Characteristic of a material, it is proportional to the magnetism induced in that material divided by strength of the magnetic field used.
Magnetic susceptibility Definition: A measure of the extent to which a substance may be magnetized; it represents the ratio of magnetization to magnetic field strength.
Magnetics, geomagnetics Definition: Geophysical methodology for studying anomalies in the geomagnetic field due to non-uniform magnetization of the subsurface. Uses magnetometers.
Magnetization Definition: The magnetic moment per unit volume. It is a vector quantity. See also magnetic susceptibility.
Magnetometer Definition: A device for measuring the earth's magnetic geomagnetic field. Variations in the field strength may indicate changes in magnetic properties of soil and rock or presence of ferrous metals.
Mapping

Term
Definition: Locating geological, chemical or geophysical information in space (as opposed to time, which is monitoring). The results are usually summarized as maps.
Matrix Definition: The solid framework of rock or mineral grains that surrounds the pore spaces.
Matrix density
Mho Definition: A unit of electrical conductance that is the reciprocal of ohm.
Micro-gravity survey Definition: A surface geophysical survey method, undertaken on a very small scale (typically station spacings of a few meters), and requiring a high meter sensitivity. Measures the earth's gravitational field at different points over an area of interest. Variations in the field are related to differences in subsurface density distributions, which in turn are associated with changes in soil, rock, and cultural factors. Typically used for cavern or fracture detection.
Microresistivity log Definition: Refers to a group of short-spaced resistivity logs that are used to make measurements of the mud cake and invaded zone.
Migration

Term
Definition: The movement of chemicals, bacteria, gases, etc. in flowing water or vapor in the subsurface. Also, a seismic/radar term whose general meaning is the correction of the recorded image for the effects of reflector dip. A very typical result of migration is the removal of hyperbolic events on the record resulting from diffractions from faults and other discontinuities.
Monitoring Definition: Observing the change in a geophysical, hydrogeological or geochemical measurement with time.
Mud cake Definition: Also called filter cake; the layer of mud particles that builds up on the wall of a rotary-drilled hole as mud filtrate is lost to the formation.
Mud filtrate Definition: The liquid effluent of drilling mud that penetrates the wall of the hole.
Muting Definition: Change in the amplitude of all or part of a trace before additional processing. Noisy or clearly erroneous traces are given zero amplitude. Data before the first break and the known refraction arrivals are also often reduced to zero amplitude.
N electrode Definition: The potential electrode distant from the A electrode in a resistivity device.

Term
Natural-gamma log
Neutron-activation log
Neutron log Definition: Neutrons from an isotopic source are measured at one or several detectors after they migrate through material in, and adjacent to, the borehole. Log response primarily results from hydrogen content, but it can be related to saturated porosity and moisture content.
Noise Definition: Any unwanted signal; a disturbance that is not part of signal from a specified source. In electrical or induced polarization (IP) surveys, noise may result from interference of power lines, motor-generators, atmospheric electrical discharges, etc. See cultural noise.
Non-aqueous-phase-liquid Definition: Elements or compounds in the liquid phase other than water. This phase is immiscible in water. Examples include petroleum hydrocarbons, like gasoline, and solvents such as trichloroethylene. Acronym: NAPL
Non-unique

Term
Definition: In geophysical interpretation and mathematical modeling, a problem for which two or more subsurface models satisfy the data equally well.
Normal log Definition: A quantitative-resistivity log, made with four electrodes, which employs spacings between 4 and 64 in. to investigate different volumes of material around the borehole; see also long-normal log and short-normal log.
Normal moveout corrections Definition: Time shift corrections to reflection arrivals because of variation in shotpoint-to-geophone distance (offset). The amount of shift depends on 1) the length of the raypath from shot to reflection point to receiver, and 2) the velocity of the material traversed. Deeper reflections are corrected using velocities indicative of the deeper section.
Nuclear log Definition: Well logs using nuclear reactions either measuring response to radiation from sources in the probe or measuring natural radioactivity present in the rocks.
Ohm Definition: The unit of electrical resistance through which 1 amp of current will flow when the potential difference is 1 V. Acronym: Ω
Ohm-meter Definition: Unit of electrical resistivity; the resistivity of 1 m3 of material, which has a resistance of 1 ohm when electrical current flows

Term
between opposite faces; the standard unit of measurement for resistivity logs. Acronym: Ωm
Open hole Definition: Uncased intervals of a drill hole.
Optimum offset Definition: Seismic reflection technique employing optimum window.
P-wave Definition: An elastic body wave in which particles move in the direction of propagation. It is the wave assumed in most seismic surveys. Also called primary or push-pull wave.
Percentage frequency effect Definition: The percent difference in resistivity measured at two frequencies (one high, one low). It is the basic polarization parameter measured in frequency domain resistivity surveys. Equivalent to chargeability in time domain surveys. Acronym: PFE
Permafrost Definition: Perennially frozen ground in areas where the temperature remains at or below 0o C for two or more years in a row.
Permittivity

Term
Definition: The property which enables a three-dimensional material to store electrical ge; i.e. its capacitivity.
Phase II study Definition: Common nomenclature for the part of an environmental investigation that first involves on-site activities (i.e. geophysics, soil gas surveys and drilling).
Phase shift Definition: A measure of the offset between two periodic signals of the same frequency. Measured in degrees or radians/milliradians.
Polarize, polarization, polarizable Definition: Separation of ge, as in induced polarization or IP.
Porosity Definition: The ratio of the void volume of a porous rock to the total volume, usually expressed as a percentage.
Precision Definition: The reproducibility of a measurement; the closeness of each of a set of similar measurements to the arithmetic mean of that set.
Primary (magnetic field)

Term
Definition: The magnetic field generated by an EM transmitter. May induce a secondary magnetic field.
Primary wave
Probe Definition: Also called sonde or tool; downhole well-logging instrument package.
Processing Definition: Geophysically, to change data so as to emphasize certain aspects or correct for known influences, thereby facilitating interpretation.
Profiling Definition: In geophysics, a survey method whereby an array of sensors is moved along the Earth's surface without change in its configuration, in order to detect lateral changes in the properties of the subsurface (faults, buried channels, etc.) The alternative is usually a sounding.
Proton Definition: The nucleus of a hydrogen atom; a positively charged nuclear particle with a mass of one; see neutron.
Pseudosection Definition: A cross section showing the distribution of a geophysical property, such as seismic travel time, from which the distribution

Term
of the geological property of interest (depth to bedrock, for example) can be interpreted.
Push-pull wave
Quadrature Definition: That part of a periodic signal that is 90 degrees out of phase with a reference signal. See also in-phase.
Radar Definition: A system whereby short electromagnetic waves are transmitted and any energy which is scattered back by reflecting objects is detected. Acronym for radio detection and ranging.
Radioactivity Definition: Energy emitted as particles or rays during the decay of an unstable isotope to a stable isotope.
Radius of investigation
Receiver Definition: The part of an acquisition system that senses the information signal.
Reflection coefficient Definition: A term used in seismic reflection and GPR to describe the ratio of the reflected to incident amplitudes of a pulse reflected

Term
from an interface.
Remanence
Remanent magnetization Definition: Magnetization remaining after the application of magnetic field has ceased.
Remedial investigation/feasibility study Acronym: RI/FS
Repeat section Definition: A short interval of log that is run a second time to establish repeatability and stability.
Resistivity (electrical) Definition: Electrical resistance to the passage of a current, expressed in ohm-meters; the reciprocal of conductivity.
Resistivity logs Definition: Any of a large group of logs that are designed to make quantitative measurements of the specific resistance of a material to the flow of electric current; calibrated in ohm-meters.
Resolution

Term
Definition: Refers to the smallest unit of measurement that can be distinguished using a particular instrument or method; based on the ability to separate two measurements which are very close together.
Resource Conservation and Recovery Act Definition: The Resource Conservation and Recovery Act passed by the US Congress in 1976 to regulate solid and hazardous waste disposal. Acronym: RCRA
Reversal Definition: A typical distortion of normal-resistivity logs opposite beds that are thinner than the AM spacing; the effect is an apparent decrease in resistivity in the center of a resistive unit.
S-wave Definition: A body wave in which particles move perpendicular to the direction of propagation. Also known as secondary or shear wave.
Saturation Definition: The percentage of the pore space occupied by a fluid, usually water in hydrologic applications.
Scintillation detector

Term
Definition: An efficient detector used in nuclear-logging equipment; radiation causes flashes of light that are amplified and output in a crystal as electronic pulses by a photo multiplier tube to which it is coupled.
Secondary (magnetic field) Definition: The magnetic field that is generated by currents that are induced to flow in the ground by time variations in the primary magnetic field of the transmitter.
Secondary porosity Definition: Porosity developed in a rock after its deposition as a result of fracturing or solution; usually not uniformly distributed.
Secondary wave
Seismic reflection Definition: A surface geophysical method recording seismic waves reflected from geologic strata, giving an estimate of their depth and thickness.
Seismic refraction Definition: A surface geophysical method recording seismic waves refracted by geological strata.
Self potential Definition: A geophysical method measuring the natural, static voltage existing between sets of points on the ground surface. See

Term
also Spontaneous Potential. Acronym: SP
Shale base line Definition: A line drawn through the SP log deflections that represent shale; a similar technique can be used on gamma logs and can represent the average log response of sand.
Shear modulus Definition: The stress-strain ratio for simple shear in isotropic materials which obey Hooke's law.
Shear wave Definition: An acoustic wave with direction of propagation at right angles to the direction of particle vibration (S wave).
Short-normal log Definition: One of a group of normal-resistivity logs usually with AM spacing of 16 in. or less.
Single-point resistance log Definition: A single electrode device used to make measurements of resistance that cannot be used quantitatively.
Skin depth Definition: The effective depth of penetration in a conducting medium of electromagnetic energy (when displacement currents can be

Term
ignored); the depth at which the amplitude of a plane wave has been attenuated to 1/e or 0.37.
Sonde
Sonic log
Sort Definition: Data in shot record form are sorted for display as common offset records, common shot records, common receiver records, or common depth point records.
Sounding Definition: In geophysics, a survey method whereby the geometry and/or frequency of an array of sensors is varied so as to measure the physical properties of the earth as a function of depth beneath the configuration. The alternative is usually profiling.
Spacing Definition: The distance between sources or transmitters and detectors or receivers on a logging probe.
Specific conductance Definition: Strictly speaking identical to electrical conductivity; the term is used in hydrogeology to refer to the conductivity of surface and ground water and expressed in micro Siemens per centimeter. It is a direct function of the total dissolved solids in the water.
Spectral analysis of surface waves

Term
Definition: An in situ seismic method that analyzes dispersion of surface waves and inverts it in terms of mechanical properties of the soil. Acronym: SASW
Spectral-gamma log Definition: A log of gamma radiation as a function of its energy that permits the identification of the radioisotopes present.
Spectral induced polarization Definition: See complex resistivity.
Spine and ribs plot Definition: A plot of long-spaced detector output versus short-spaced detector output for a dual detector gamma-gamma probe; permits correction for some extraneous effects.
Spinner survey Definition: A log made with an impeller flowmeter.
Spontaneous Potential Definition: See Self Potential. Acronym: SP

Term
Spontaneous-potential log Definition: A log of the difference in DC voltage between an electrode in a well and one at the surface; most of the voltage results from electrochemical potentials that develop between dissimilar borehole and formation fluids.
Stacking Definition: Adding together two or more signals. This process is often used in geophysics to improve the signal to noise ratio. A common application is stacking seismic signals in seismic refraction data recording.
Standoff Definition: Distance separating a probe from the wall of a borehole.
Statics Definition: Time shift corrections to individual traces to compensate for the effects of variations in elevation, surface layer thickness or velocity, or datum references.
Streaming potential Definition: A voltage resulting from flow of an ionic fluid.
Surface wave Definition: A wave that travels along, or near to, the surface; its motion dropping off rapidly with distance from it. A distinct seismic

Term
mode from the body waves, P- and S.
Survey Definition: Oil-industry term used for the performance or result of a well-logging operation.
Target Definition: The object at which a survey sighting is aimed.
Temperature log Definition: A log of the temperature of the fluids in the borehole; a differential temperature log records the rate of change in temperature with depth and is sensitive to very small changes.
Terrain conductivity Definition: Geophysical method in which EM methods measure directly the average electrical conductivity of the ground. Operates at low induction number.
Thermal neutron Definition: A neutron that is in equilibrium with the surrounding medium such that it will not change energy (average 0.025 eV) until it is captured.
Time constant

Term
Definition: The time in seconds required for an analog system to record 63 percent of the change that actually occurred from one signal level to another.
Time domain Definition: In geophysics refers to measurements analyzed according to their behavior in time. The usual alternative is frequency domain measurements.
Time Domain Electromagnetics Definition: See Transient Electromagnetics. Acronym: TDEM
Time domain reflectometry Definition: A device, which measures electrical characteristics of wideband transmission systems. Commonly used to measure soil moisture content. Acronym: TDR
Tomography Definition: A method for determining the distribution of physical properties within the earth by inverting the results of a large number of measurements made in three dimensions (e.g. seismic, radar, resistivity, EM) between different source and receiver locations.
Tool

Term
Tracejector log
Tracer log Definition: Also called tracejector log; a log made for the purpose of measuring fluid movement in a well by means of following a tracer injected into the well bore; tracers can be radioactive or chemical.
Track Definition: Term used for the areas in the American Petroleum Institute log grid that are standard for most large well-logging companies; track 1 is to the left of the depth column, and tracks 2 and 3 are to the right of the depth column, but are not separated.
Transducer Definition: Any device that converts an input signal to an output signal of a different form; it can be a transmitter or receiver in a logging probe.
Transient Definition: Occurring when the system is still changing with time; i.e., a steady state has not been attained. Most groundwater flow systems are transient, not steady state.
Transient Electromagnetics Definition: An electromagnetic surveying method in which the waveform of the transmitted signal is a pulse, step function, ramp or

Term
other form which can be considered to be nonperiodic and in which measurements are made after the primary field has stopped changing (Shariff, 1973). Generally used as a sounding method for differentiating electrically contrasting geologic media. Also referred to as Time Domain Electromagnetics (TDEM). Acronym: TEM
Variable-density log Definition: Also called 3-dimensional log; a log of the acoustic wave train that is recorded photographically, so that variations in darkness are related to the relative amplitude of the waves. Acronym: VDL
Velocity panels Definition: A set of stacked test sections with a progression of assumed normal-moveout velocities applied. A powerful method for determining velocities if distinct reflection events are present, as the reflections will be coherent where the velocities are correct and be degraded in appearance at higher or lower NMO velocities.
Volume of investigation
Well log Definition: A record describing geologic formations and well testing or development techniques used during well construction. Often refers to a geophysical well log in which the physical properties of the formations are measured by geophysical tools, E-logs, neutron logs, etc.
Z/A effect

Term
Definition: Ratio of the atomic number (Z) to the atomic weight (A), which affects the relation between the response of gamma-gamma logs and bulk density.