Ss

sabka, *n* – [GEOLOGY] a supratidal ENVIRONMENT of SEDIMENTATION, formed under arid to semiarid conditions on restricted COASTAL PLAINS just above normal high-tide level. It is gradational between the LAND SURFACE and the intertidal environment. Sabkhas are characterized by evaporite-salt, tidal-flood, and eolian deposits, and are found on many modern coastlines. *Also see dolomite and evaporite.*

sacrificial anode, *n* – [UNDERGROUND STORAGE TANK TECHNOLOGY] an easily corroded material deliberately installed in a pipe or intake to give it up (sacrifice it) to corrosion while the rest of the water supply facility remains relatively corrosion-free. Can be part of a cathodic protection system for an UNDERGROUND STORAGE TANK.

saddle, *n* – [GEOLOGY] *1*. a low point or COL on a ridge connecting two summits. *2*. a structural feature associated with a sag in the crest of an ANTICLINE[7].

safe, *n* – [TOXICOLOGY] condition of exposure under which there is a practical certainty that no harm will result to exposed individuals.

Safe Drinking Water Act, *n* – [ENVIRONMENTAL REGULATION] an amendment to the Public Health Service Act which established primary and secondary quality standards for drinking water. The SDWA was passed in 1976 to protect public health by establishing uniform drinking water standards for the nation. In 1986 SDWA Amendments were passed that mandated the U.S. Environmental Protection Agency (EPA) to establish standards for 83 drinking water contaminants by 1992 and identify an additional 25 contaminants for regulation every 3 years thereafter.

safe yield, *n* – [HYDROGEOLOGY] the amount of naturally occurring GROUND WATER that can be economically and legally with drawn from an AQUIFER on a sustained basis without impairing the native groundwater quality or creating an undesirable effect such as environmental damage. It cannot exceed the increase in recharge or leakage from adjacent STRATA plus the reduction in discharge, which is due to the decline in head caused by pumping.

salcrete, *n* – [GEOLOGY] a surface crust, mainly of sodium chloride, which cements a sand surface on a beach by the evaporation of seaspray[7]. *Also see calcrete and silcrete.*

Salic horizon, *n* – [AGRONOMY] a subsurface soil that is at least 15 centimeters thick and salt enriched (2 to 3 %).

salient, *n* – [GEOGRAPHY] a projecting spur or headland which protrudes from a line of hills or a coastline[7].

salina, *n* – [GEOLOGY] *from Portuguese and Spanish,* a place where CRYSTALLINE SALT DEPOSITS are formed or found, such as a salt flat or pan, a salada, or a salt lick, especially, a salt-encrusted PLAYA or a wet playa. *Also known as a salt flat. Also see playa and salt.*

saline *adj* – [CHEMISTRY] impregnated or containing salt or salts.

salinity, *n* — [CHEMISTRY] the CONCENTRATION OF DISSOLVED MATTER found in WATER after bromide and iodide have been replaced by an equivalent quantity of CHLORIDE, all carbonate converted to oxide, and all ORGANIC MATTER destroyed.

> DISCUSSION -- the average salinity of the oceans is about 35 parts per thousand or about 3.5%. Salinity values can differ in areas where there is a large inflow of fresh water, areas of heavy precipitation, such as the tropics, or areas of heavy ice formations.
> Fresh = <1,000 mg/l
> Slightly saline = 1,000-3,000 mg/l
> Moderately saline = 3,000-10,000 mg/l
> Highly saline = 10,000-35,000 mg/l

salt, *n* – [CHEMISTRY] *1*. the MINERAL sodium chloride. *2*. COMPOUNDS that are produced as the result of a METAL ATOM replacing a HYDROGEN atom in an ACID.

salt flat, *n – Also see salina.*

salt pan, *n* – [HYDROLOGY] a very shallow, enclosed basin of salty water, usually fed from the sea.

salt water—*See sea water.*

salt-water intrusion, *n* – [HYDROGEOLOGY] the invasion of FRESH SURFACE or GROUND WATER by *salt* water. If it comes from the OCEAN it may be called SEA WATER INTRUSION.

saltation, *n* – [GEOLOGY] movement of soil and mineral particles by intermittent leaps from the ground when the particles are being moved by water or wind.

saltpanne, *n* -- [HYDROLOGY] salty low flat area. Salts left behind after tidewater evaporates. Also spelled Salt Pans (which are also pans used for making salt by evaporating seawater).

sample, *n* — [ENVIRONMENTAL INVESTIGATION] *1*. a portion of material taken from a larger quantity for the purpose of estimating properties or composition of the larger quantity. *2*. one or more items or portions collected from a lot or population. *3*. a portion of material which is collected for testing or for record purposes.

> DISCUSSION — Sample is a term with numerous meanings. The project team member collecting physical samples (for example, from a landfill, drum or waste pipe) or analyzing samples considers a sample to be that unit of the

population collected and placed in a container. In statistics, a sample is considered to be a subset of the population and this subset may consist of one or more physical samples. To minimize confusion, the term "physical sample" is a reference to the sample held in a sample container or that portion of the population that is subjected to measurement.

sample contacting equipment, *n* — [ENVIRONMENTAL INVESTIGATION] equipment that comes in direct contact with the SAMPLE or portion of sample that will undergo CHEMICAL ANALYSES or PHYSICAL testing (for example, ground water well bailer, split-spoon sampler, soil gas sampling probe).

sampling, *v* — [ENVIRONMENTAL INVESTIGATION] obtaining a representative portion of the material concerned.

sampling design, *n* — [ENVIRONMENTAL INVESTIGATION] *1.* the sampling schemes specifying the point(s) for sample collection; *2.* the sampling schemes and associated components for implementation of a sampling event.

DISCUSSION — Both of the above definitions are commonly used within the environmental community. Therefore, both are used within this document.

sampling error, *n* — [STATISTICS] the systematic and random deviations of the sample value from that of the population. The systematic error is the SAMPLING BIAS. The random error is the SAMPLING VARIANCE.

DISCUSSION — Before the physical samples are taken, potential sampling variance comes from the inherent population heterogeneity (sometimes called the "fundamental error," see *heterogeneity*). In the physical sampling stage, additional contributors to sampling variance include random errors in collecting the samples. After the samples are collected, another contributor is the random error in the measurement process. In each of these stages, systematic errors can occur as well, but they are the sources of bias, not sampling variance.

sampling interval, *n* – [ENVIRONMENTAL INVESTIGATION] the depth and location of soil or sediment samples.

sampling process, *n* — [ENVIRONMENTAL INVESTIGATION] the method and procedure of collecting PHYSICAL SAMPLES from a defined POPULATION.

sand, *n* — [GEOLOGY] particles of rock that will pass the No. 4 (4.75-mm) sieve and be retained on the No. 200 (75-µm) U.S. standard sieve.

sandspit—*See spit.*

sandstone, *n* – [GEOLOGY] a CLASTIC ROCK composed of particles that range in diameter from 1/16 millimeter to 2 millimeters in diameter. Sandstones make up about 25% of all SEDIMENTARY ROCKS.

sandur/sandar, *n* – [GEOLOGY] a sheet, or gently sloping fan of outwash sands and gravel. *Also see outwash plain*.

Sangamon Interglacial Stage, *n* – [GEOLOGY] an interglacial time period, between advances of the North American ice sheet, from about 380,000 years BP to about 180,000 BP

sanitary sewer, *n* – [WASTE DISPOSAL] a system of underground PIPES that carry off only domestic or industrial waste, not storm water, normally to a treatment facility.

sap, *n* – [DENDROLOGY] the fluid part of a plant, a watery solution that circulates through a plant's vascular system[12].

sapping, *n* – [GEOLOGY] the breaking down and undermining of part of a hillslope such that small slips occur.

saprolite, *n* – [GEOLOGY] soft, CLAY-rich, thoroughly DECOMPOSED ROCK formed in place by CHEMICAL WEATHERING of IGNEOUS or METAMORPHIC rock.

sapwood, *n* – [DENDROLOGY] the outer layers of XYLEM which, in the growing tree, contain living cells with stored food reserves[12].

sapwood-hardwood boundary (SHB), *n* – [DENDROLOGY] the interface between the SAPWOOD, or the wood which transports water and nutrients from the roots and through the tree to the leaves, and the heartwood, usually of a darker color which develops in the center of the trunk and larger branches.

saturate, *v* – [HYDROLOGY] to fill with moisture or liquid, soak thoroughly.

saturates, *n* – [PETROLEUM CHEMISTRY] ALKANES. HYDROCARBON compounds that do not contain double or triple BONDS.

savanna, **savannah**, *n* – [GEOGRAPHY] a TROPICAL or sub-tropical plant community characterized by TREES and shrubs scattered among a cover of grasses, herbs and forbs. The climate of a savanna is tropical with a dry season occurring in the low sun period of the year. *Also known as campo and llano.*

scabland, *n* — [GEOGRAPHY] an elevated area of barren, rocky land with little or no soil cover, often crossed by dry stream channels.

scale, *n* – [PHYSICS] a specific relative or proportional size or extent of a phenomena as measured through space and/or time.

scarification, *n* – [GEOLOGY] decreasing the smoothness of the land surface[66].

scarp, *n* – [GEOGRAPHY] a steep slope.

scarpfoot spring, *n* – [HYDROGEOLOGY] a SPRING at the foot of a SCARP, often where permeable rocks are underlain by impermeable rocks.

scarp slope, *n* – [GEOGRAPHY] a steep slope - the steeper ridge of an escarpment. The other side is gentler and called a dip slope.

scavenger, *n* – [PETROLEUM CHEMISTRY] halogenated compounds present in a leaded gasoline to prevent lead compounds such as lead oxides or lead sulfates from building up in a combustion chamber. Common scavengers formerly used in gasoline include ETHYLENE DICHLORIDE (EDC) and ETHYLENE DIBROMIDE (EDB).

schist, *n* – [Geology] a coarse-grained, strongly FOLIATED METAMORPHIC rock that develops from phyllite and splits easily into flat, parallel slabs.

schistosity, *n* – [GEOLOGY] the variety of FOLIATION that occurs in the coarser grained METAMORPHIC ROCKS and is generally the result of the parallel arrangement of platy and ellipsoidal mineral grains within the rock substance.

Schmidt Method, *n* -- [AGE DATING] a method used to estimate the age of gasoline releases. Because of the requirement to reformulate gasoline, known as "RFG," the concentration of toluene in regular and mid-grade gasoline since the 1970s has increased, while the composition of paraffins, in particular, the *n*-C_8 alkane (*n*-octane) has decreased. To determine if regular or mid-grade gasoline is present, the octane index (OI) must be calculated where OI = (Iso-octane + toluene)/(*n*-C_7 + *n*-C_8). Accordingly, the ratio of these two compounds can be used to estimate the age of gasoline.

science, *n* – a method of acquiring knowledge. To do science, one must follow a specific universal METHODOLOGY. The central theme in this methodology is the testing of HYPOTHESES and the ability to make PREDICTIONS. The overall goal of science is to better understand nature and our Universe.

scientific law, *n* – [LOGIC] *1*. a natural phenomenon that has been proven to occur invariably whenever certain conditions are met. *2*. a formal statement describing such a phenomenon and the conditions under which it occurs.

scientific method, *n* – [LOGIC] techniques that involve gathering all available data on a subject, forming a hypothesis to explain the data, conducting experiments to test the HYPOTHESIS, and modifying or confirming the hypothesis as necessary to account for the experimental results.

scientist, *n* -- a person learned in science and especially natural science, scientific investigator.

scissor fault—*See pivot fault.*

scoria, *n* – [GEOLOGY] LAVA or TEPHRA fragments containing numerous cavities produced by expanding gases during cooling.

scour, *v* – [HYDROLOGY] to abrade or wear; used to describe the wearing away of TERRACES, CHANNELS or STREAM BEDS.

scree, *n* – [GEOLOGY] an accumulation of WEATHERED ROCK FRAGMENTS at the base of a steep rock slope or cliff.

screen, *n* – *See well screen.*

scroll, *n* – [HYDROLOGY] a low, narrow ridge running parallel with a MEANDER and formed in times of FLOOD.

scrub, *n* – [DENDROLOGY] low or stunted trees and shrubs, found in such adverse conditions as exposed hillsides, semi-deserts and areas of poor soil.

sea, *n* – [HYDROLOGY] *1*. a body of SALINE WATER found on the Earth's continental surface. 2. A portion of an ocean that is in close proximity to a continent. *Also see ocean.*

sea level, *n* – [GEOGRAPHY] in the United States, the National Geodetic Vertical Datum of 1929 – a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

sea water, *n* – [HYDROLOGY] water originating in or from the sea.

sea water intrusion-- *See salt-water intrusion.*

secondary containment or diversion system, *n* – [ENVIRONMENTAL REGULATION] any structures, devices or combinations thereof supplementary to the ordinary containers employed in the normal course of storage, transfer, processing or use, designed and operated to prevent leaks of hazardous substances from becoming discharges.

secondary drinking water standards, *n* – [ENVIRONMENTAL REGULATION] non-enforceable federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water.

secondary filter pack, *n* — [HYDROGEOLOGY] a clean, uniformly graded sand that is placed in the ANNULUS between the primary filter pack and the over-lying seal, or between the seal and overlying grout backfill, or both, to prevent movement of seal or grout, of both, into the primary filter pack.

secondary clarifier, *n* – [TREATMENT TECHNOLOGY] in a waste-treatment plant, a basin or tank that receives liquid from a trickling filter or an activated sludge tank; here settleable solids are removed by sedimentation[63].

secondary porosity, *n* – [HYDROGEOLOGY] the porosity that has been caused by fractures or the weathering of a rock or sediment after it was formed. *Also see effective porosity and porosity.*

secondary soil, *n* – [AGRONOMY] a soil transported from its place of formation.

secondary wastewater treatment, *n* – [TREATMENT TECHNOLOGY] wastewater treatment using biological methods (bacterial action) in addition to primary treatment by screening, sedimentation and flotation. In secondary treatment, bacteria are used to destroy organic wastes as the water trickles over coarse-grained sand. This process removes up to 90 percent of the dissolved pollutants, but leaves many other pollutants untouched[63]. *Also see primary wastewater treatment and tertiary wastewater treatment.*

second law of thermodynamics, *n* – [PHYSICS] the second law states that every spontaneous process causes a net increase in the entropy of the universe. Heat can never pass spontaneously from a body at a lower temperature to a body at a higher temperature. *Also see the first, third and zeroth laws of thermodynamics.*

secretion, *n* – [BIOLOGY] a secondary structure formed of material deposited from solution within a cavity in a rock, such as a vein or a geode[4].

sedentary, *adj* – [PHYSICS] fixed, not moving.

sedentary soil, *n* – [AGRONOMY] a soil formed from the parent rock which it still overlies.

sediment, *n* -- [GEOLOGY] an assemblage of individual mineral grains that were deposited by some geologic agent such as water, wind, ice or gravity. From the Latin word *sedimentum*, meaning "settling". *Also see sedimentology and stratigraphy.*

sedimentary basin, *n* – [GEOLOGY] TERRAIN consisting of SEDIMENTARY ROCK deposited over the course of many *eras*.

sedimentary rock, *n* – [GEOLOGY] a ROCK made from the consolidation of solid fragments, as of other rocks or organic remains, or by precipitation of minerals from solution. *Also see sediment, sedimentology and stratigraphy.*

sedimentation, *n* – [TREATMENT TECHNOLOGY] an early stage in the purification of raw polluted water whereby suspended particles in the water are allowed to settle[63].

sedimentation tank—*See clarifier*.

sediment dating, *n* – [AGE DATING] the act or process of estimating the time frame when sediment was deposited. Laboratory analysis for isotopes such as ^{210}Pb, ^{137}Cs and ^{90}Sr can be used to estimate these time frames. *Also see lead-210 dating*.

sedimentology, *n* – [GEOLOGY] the scientific study of SEDIMENTARY ROCKS and of the processes by which they were formed; the description, classification, origin, and interpretation of sediments. *Also see sediment, Stoke's Law and stratigraphy.*

seem, *n – Also see bed, layer and strata.*

seep, *n* — [GEOLOGY] a small area where water or petroleum oozes from the soil or rock.

seepage, *n* — [HYDROGEOLOGY] *1*. the INFILTRATION or PERCOLATION of water through rock or soil to or from the surface. *2*. the slow movement of gravitational water through the SOIL or ROCK.

seepage force, *n* — [HYDROGEOLOGY] *1*. the frictional drag of water flowing through VOIDS or INTERSTICES in rock, causing an increase in the intergranular pressure, that is, the hydraulic force per unit volume of rock or soil which results from the flow of water and which acts in the direction of flow. *2*. the force transmitted to the soil or rock grains by SEEPAGE.

seepage pit, *n* – [WASTE DISPOSAL] an underground reservoir normally for industrial, liquid waste without treatment. *also see cesspool, dry well, leachfield and septic tank.*

seepage velocity, *n,* — [HYDROGEOLOGY] the RATE of DISCHARGE of seepage water through a porous medium per unit area of void space perpendicular to the direction of flow.

seiche, *n* – [HYDROLOGY] a short-term oscillation in the surface of a lake or land-locked sea which may be caused by a persistent strong wind or a change in atmospheric pressure[63].

selecting ion monitoring (SIM), *n* – [CHEMISTRY] mass spectrometric monitoring of a specific mass/charge (M/Z) ratio. The SIM mode offers better sensitivity than can be obtained using the full scan mode[51]. The SIM mode can be used to detect many of the biomarkers present in petroleum for fingerprinting purposes.

semi-volatile organic compounds, *n* – [CHEMISTRY] compounds amenable to analysis by extraction of the sample with an organic solvent. *Also referred to as base/neutral extractable compounds (B/Ns).*

senescent lake, *n* – [HYDROLOGY] a lake nearing extinction, especially through the accumulation of the remains of aquatic vegetation[63].

senior judge, *n* – [LAW] a federal judge who, after attaining the requisite age and length of judicial experience, takes senior status, thus creating a vacancy among a court's active judges. A senior judge retains the judicial office and may cut back his or her workload by as much as 75 percent, but many opt to keep a larger caseload.

sensitivity analysis, *n* – [MATHEMATICS] a procedure based on systematic variation of model input values *1.* to identify those model input elements that cause the most significant variations in model output; and *2.* to quantitatively evaluate the impact of uncertainty

in model input on the degree of calibration and on the model's predictive capability.

sentinel well, *n* – [HYDROGEOLOGY] a MONITORING WELL placed DOWNGRADIENT of a contaminated SITE as a safeguard to an on-coming PLUME. *Also see monitoring well, observation well and piezometer*.

separate phase, *n* – [PHYSICS] a distinct phase as opposed to an aqueous phase, where the distinct phase is differentiated by density, viscosity, surface tension and chemical composition.

separation processes, *n* – [PETROLEUM TECHNOLOGY] process used in petroleum refining to separate the feed stock into two or more components based on some physical property, usually boiling point. These processes do not otherwise change the feedstock. The most common separation process in the refinery is DISTILLATION.

separate sewer, *n* – [TREATMENT TECHNOLOGY] a SEWER that carries waste water but excludes storm and surface waters[63].

septage, *n* — [WASTE DISPOSAL] SEPTIC TANK SLUDGE that is a combination of raw primary sludge and an anaerobically produced raw sludge.

septic tank, *n* – [WASTE DISPOSAL] an UNDERGROUND STORAGE TANK for wastes from homes not connected to a sewer line. Waste goes directly from the home to the tank. *Also see cesspool, dry well, leachfield, seepage pit and septic system.*

septic system, *n* – [WASTE DISPOSAL] an on-site system designed to treat and dispose of domestic sewage. A typical septic system consists of tank that receives waste from a residence or business and a system of tile lines or a pit for disposal of the liquid effluent (sludge) that remains after decomposition of the solids by bacteria in the tank and must be pumped out periodically. *Also see cesspool, dry well, leachfield, seepage pit and septic tank.*

sequestration, *n* – [CHEMISTRY] the inhibition or prevention of normal ion behaviour by combination with added materials, especially the prevention of metallic ion precipitation from solution by formation of a coordination compound with a phosphate.

sesquioxide, *n* – [CHEMISTRY] CHEMICAL COMPOUNDS which are common in many SOILS resulting from the WEATHERING process. They are oxides containing three atoms of oxygen with two atoms (or RADICALS) of some other substance; thus, alumina, Al_2O_3 is a sesquioxide.

sesquiterpanes, *n* – [FINGERPRINTING] a class of saturated biomarkers constructed of three isoprene units $(\sim C_{15})$[34].

sesterterpanes, *n* – [FINGERPRINTING] a class of saturated biomarkers constructed of five isoprene units $(\sim C_{25})$[34].

settleable solids, *n* – [TREATMENT TECHNOLOGY] bits of debris and fine matter heavy enough to settle out.

settlement, *n* – [LAW] parties to a LAWSUIT resolve their difference without having a TRIAL. Settlements often involve the payment of compensation by one party in satisfaction of the other party's claims.

settlement agreement, *n* – [LAW] in a CIVIL LAWSUIT, the document that spells out the terms of an out-of-court compromise.

settling tank, *n* – [TREATMENT TECHNOLOGY] a tank (basin) in which SETTLEABLE SOLIDS are removed by gravity[63].

sewage, *n* – [WASTE DISPOSAL] the WASTE and WASTEWATER produced by residential and commercial sources and discharged into SEWERS. *Also see sewer and sewerage.*

sewage lagoon, *n* – [TREATMENT TECHNOLOGY] a shallow pond, three to five feet deep, where natural biological processes purify wastewater to a degree comparable to that accomplished through SECONDARY WASTEWATER TREATMENT[63].

sewage sludge, *n* – [WASTE DISPOSAL] the dried or semi-liquid residue of a sewage treatment process.

sewage treatment plant, *n* – [WASTE DISPOSAL] a facility designed to receive the WASTEWATER from domestic sources and to remove materials that damage water quality and threaten public health and safety when discharged into receiving streams or bodies of water. The substances removed are classified into four basic areas: *1*. greases and fats; *2*. solids from human waste and other sources; *3*. dissolved pollutants from human waste and decomposition products; and *4*. dangerous microorganisms. Most facilities employ a combination of mechanical removal steps and bacterial decomposition to achieve the desired results. Chlorine is often added to discharges from the plants to reduce the danger of spreading disease by the release of pathogenic bacteria.

sewage works, *n* – [TREATMENT TECHNOLOGY] wastewater installations, including both the sewer systems and wastewater treatment plant[63].

sewer, *n* – [HYDROLOGY] a CHANNEL or CONDUIT that carries WASTEWATER and STORM-WATER RUNOFF from the source to a treatment plant or receiving stream. "Sanitary" sewers carry household, industrial, and commercial waste. "Storm" sewers carry runoff from rain or snow. "Combined" sewers handle both. *Also see collecting sewer, combined sewer, intercepting*

sewer, outfall sewer, separate sewer, sewage, sewerage and trunk sewer.

sewerage, *n* – [HYDROLOGY] the entire system of sewage collection, treatment, and disposal. *Also see sewage and sewer system.*

sextant, *n* – [GEOGRAPHY] an instrument for measuring angular distances used especially in navigation to observe altitudes of celestial bodies (as in ascertaining latitude and longitude). *Also see compass.*

shale, *n* – [GEOLOGY] a SEDIMENTARY ROCK composed of detrital SEDIMENT particles less than 0.004 millimeter in diameter and characterized by a FISSILE nature. Shales tend to be red, brown, black, or gray, and usually originate in relatively still waters. *Also see argillite, clay and claystone.*

shatter belt, *n* – [GEOLOGY] a zone of fragmented ROCK caused by movement along a FAULT.

shearing, *n* – [PHYSICS] a type of internal motion, or DEFORMATION, in which thin layers of MOLECULES glide over one another.

shear zone, *n* – [GEOLOGY] a tabular zone of rock that has been crushed and brecciated by many parallel fractures due to shear strain. Such an area is often mineralized by ore-forming solutions.

sheen, *n* – [PHYSICS] *1*. a gloss or luster on a SURFACE. *2*. the impact of DISSOLVED PETROLEUM in WATER producing a change of the reflective properties of a water surface.

> DISCUSSION – A petroleum sheen should not be confused with an iron sheen. A petroleum sheen produces a rainbow-like color and swirled when it moves. A iron sheen breaks into pieces when it is touched.

Also see film, free product and NAPL.

sheet flow, *n* — [HYDROLOGY] an OVERLAND FLOW or downslope movement of WATER taking the form of a thin, continuous film over relatively smooth SOIL or ROCK surfaces and not concentrated into CHANNELS larger than RILLS.

sheetpiling, *n* – [CONSTRUCTION] a pile with a generally flat cross section, made to interlock with adjoining sections to form a thin diaphragm wall or bulkhead; used to resist the lateral force of retained earth or water when part of temporary and permanent structures.

shelby tube, *n* – [ENVIRONMENTAL INVESTIGATION] a hollow, metal device used to insert into BOREHOLES for the collection of SOIL SAMPLES to be analyzed for geotechnical parameters.

shelves, *n* – [HYDROLOGY] streambank features extending nearly horizontally from the FLOOD PLAIN to the lower limit of persistent woody vegetation[47].

shield, *n* – [GEOLOGY] the very old, rigid core of relatively stable ROCKS within a CONTINENT. *Also see craton.*

shingle beach, *n* – [GEOLOGY] BEACH composed of well-rounded COBBLES[6]. *Also see beach.*

shoal, *n* – [HYDROLOGY] a shallow place in a body of WATER. *Also see bank or levee.*

shore, *n* – [GEOGRAPHY] *1*. the land area bordering a relatively large water body like a LAKE or OCEAN. 2. a bank of coastal sediment that rises almost to the surface of the sea, thereby creating a navigation hazard[6].

short-lived daughters, *n* – [CHEMISTRY] radioactive isotope progeny of radioactive isotopes that have half-lives on the order of a few hours or less[64].

shott, *n* – [HYDROLOGY] *from Arabic,* a shallow and sometimes SALINE LAKE or watercourse which may dry out at certain seasons[6]. *Also known as chott and schott*.

shrinking plume, *n* – [HYDROGEOLOGY] configuration where the SOLUTE PLUME margin is receding back toward the source area over TIME and the CONCENTRATIONS at points within the plume are decreasing over time. *Also known as a contracting plume.*

sial, *n* – [GEOLOGY] the CONTINENTAL CRUST dominated by MINERALS rich in SILICA and ALUMINIUM (hence 'SIAL' from SIlica and ALuminum). *Also see sima.*

sidegradient, *adj* – [HYDROGEOLOGY] PERPENDICULAR to the SLOPE. Normally used when describing locations in relation to the GROUND-WATER FLOW DIRECTION. *Also see downgradient, ground-water flow direction and upgradient*.

sierra, *n* – [GEOLOGY] *from Spanish,* a range of mountains especially with a serrated or irregular outline. *Also see mountain range.*

sieve analysis, *n* — [GEOLOGY] determination of the proportions of PARTICLES lying within certain size ranges in a GRANULAR MATERIAL by separation on sieves of different size openings.

signal, *n* – [PHYSICS] in general, an event or phenomenon that conveys information from one place to another[6].

signature, *n* -- [FINGERPRINTING] something (as a tune, style, or logo) that serves to identify an object, a characteristic mark.

significant, *adj* — [STATISTICS] a term applied to differences, correlations, cause-and-effect relationships, etc., to indicate that they are probably not due to chance alone. Significant ordinarily indicates a probability of not less than 95 percent,

while highly significant indicates a probability of not less than 99 percent.

silcrete, *n* – [GEOLOGY] a very tough SANDSTONE that has been silicified, perhaps when it formed part of a DURICRUST[6].

silica, *n* – [GEOLOGY] the chemically resistant dioxide of silicon, SiO_2; occurs naturally as five crystalline polymorphs: trigonal and hexagonal quartz, orthorhombic and hexagonal tridymite, tetragonal and isometric cristobalite, monoclinic coesite, and tetragonal stishovite. Also occurs as cryptocrystalline chalcedony, hydrated opal, the glass lechatelierite, skeletal material in diatoms and other living organisms, and fossil skeletal material in diatomite and other siliceous accumulations. Also occurs with other chemical elements in silicate minerals.

silicon (Si), *n* – [CHEMISTRY] a nonmetallic ELEMENT that is the second most abundant on Earth, being exceeded only by OXYGEN. Silicon is not found free in nature, but occurs as the oxide and silicate. Sand, QUARTZ, rock crystal, amethyst, agate, flint, jasper, and opal are some of the forms in which the oxide appears.

sill, *n* – [GEOLOGY] a concordant PLUTON that is substantially wider than it is thick. Sills form within a few kilometers of the Earth's surface. *Also see dike*.

silt (inorganic silt) (rock flour), *n* — [GEOLOGY] material passing the No. 200 (75 μm) U.S. standard sieve that is nonplastic or very slightly plastic and that exhibits little or no strength when air-dried.

siltation, *n* – the accumulation of fine-grained sediments in a body of water, which generally leads to it becoming choked up[6].

silt size, *n* — [GEOLOGY] that portion of the *soil finer* than 0.02 mm and *coarser* than 0.002 mm (0.05 mm and 0.005 mm in some cases).

siltstone, *n* – [GEOLOGY] FINE-GRAINED SEDIMENTARY ROCK composed of LITHIFIED SILT PARTICLES.

Silurian Period, *n* – [GEOLOGY] a period of the PALEOZOIC, thought to have covered the span of time between 510 and 439 million years ago; also, the corresponding system of rocks. The Silurian follows the ORDOVICIAN and precedes the DEVONIAN; in the older literature, it was sometimes considered to include the Ordovician. It is named after the Silures, a Celtic tribe.

sima, *n* – [GEOLOGY] the lower part of the continental crust and the oceanic crust, dominated by SILICA and MAGNESIUM (hence SIMA from SIlica and MAgnesium). *Also see sial.*

single-cased well, *n* — [HYDROGEOLOGY] a MONITORING WELL constructed with a RISER but without an exterior CASING. *Also see monitoring well.*

sinkhole, *n* – [GEOLOGY] a circular, often funnel-shaped DEPRESSION in the GROUND that forms when soluble rocks dissolve. *Also see calcite, dolomite, karst and limestone.*

sinter, *n* – [GEOLOGY] a deposit of MINERAL, notably of SILICA and sulphates, precipitated in layered deposits from the gases released in an area of VOLCANIC activity.

sinuosity, *n* — [HYDROLOGY] 1. the nature of a meandering and winding stream system. 2. the ratio of the THALWEG length (such as the line connecting the deepest points along a stream) to valley length, for a specific reach of a river or stream system. This is, in essence, a ratio of the stream's actual "running" length to its down-gradient length.

site, *n* -- the place, scene, or point of something.

site conceptual model, *n* – [HYDROGEOLOGY] the integrated representation of the physical and environmental context, the complete and potentially complete exposure pathways and the potential fate and transport of chemical(s) of concern at a site. The site conceptual model should include both the current understanding of the site and the understanding of the potential future conditions and uses for the site. It provides a method to conduct the exposure pathway evaluation, inventory the exposure pathways evaluated, and determine the status of the exposure pathways as incomplete, potentially complete or complete.

site inspection (SI), *n* — [ENVIRONMENTAL INVESTIGATION] an on-site INVESTIGATION to determine whether a release or potential release exists and the nature of the associated threats. The purpose is to augment the data collected in the preliminary assessment and to generate, if necessary, sampling and other field data to determine whether further action or investigation is appropriate.

site investigation, *n* – [ENVIRONMENTAL INVESTIGATION] the collection and evaluation of DATA adequate to determine whether or not discharged CONTAMINANTS exist at a SITE or have migrated or are migrating from the site at levels in excess of the applicable remediation standards. A site investigation shall be developed based upon the information collected pursuant to the PRELIMINARY ASSESSMENT. *Also see preliminary assessment and phase 1 environmental site assessment.*

site remediation, *n* — [REMEDIATION TECHNOLOGY] those actions taken in the event of a RELEASE or threatened release of a HAZARDOUS SUBSTANCE in to the ENVIRONMENT, to prevent or minimize the impact of the release, or to mitigate a substantial hazard to

present or future environmental conditions. This early action may or may not lead to ultimate restoration of the site.

site specific, *adj* – [ENVIRONMENTAL INVESTIGATION] activities, information and data unique to a particular site.

SI units, *n* – [PHYSICS] system of coherent metic units proposed for international acceptance in 1960. SI stands for *Système International d'Unités*.

skerry, *n* – [GEOGRAPHY] a small ISLAND.

skewed result, *n* – [STATISTICS] a frequency distribution in which the number of findings is not balanced around the mean figure.

skin effect, *n* – [HYDROGEOLOGY] the effect of the zone of reduced PERMEABILITY immediately around the BOREHOLE on transient flow phenomena in pumping tests.

slag, *n* – [WASTE DISPOSAL] vitreous REFUSE left over after ore has been smelted.

slam bar, *n* -- [ENVIRONMENTAL INVESTIGATION] a hand-held weight used to pound direct push rods into the ground. Originally designed for steel fence posts.

slate, *n* – [GEOLOGY] a fine-grained, FOLIATED METAMORPHIC ROCK that develops from SHALE and tends to break into thin, flat sheets.

sleet, *n* – [METEOROLOGY] type of PRECIPITATION, transparent or translucent bits of frozen water with a diameter less than 5 millimeters. To form, these pellets require an environment where raindrops develop in an atmosphere with a temperature above freezing and then fall into a lower layer of air with temperatures below freezing. In the lower layer of cold air the raindrops freeze into small ice pellets. Normally, to provide temperatures above freezing in the atmosphere above a colder atmospheric layer, an upper air temperature inversion, is required.

slick, *n* – [PETROLEUM CHEMISTRY] if an oil tanker runs aground or sinks, an environmental disaster known as an "oil slick" will probably occur. An oil slick is a layer of oil floating on water, this can be devastating to marine life and very costly to clean up. Estimates suggest 2 million barrels are lost every year in this way.

slickensides, *n* — [GEOLOGY] a smooth striated polished surface produced on rock by movement along a fault.

slope, *n* – [GEOGRAPHY] the inclination of the LAND SURFACE from the HORIZONTAL. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

slough, *n* – [GEOLOGY] *1*. soil or rock that has fallen down a borehole and can be mistaken native material within a certain depth interval. *2*. a place of deep mud or mire; a wet or marshy place as a swamp or marshland creek. Also a side channel or inlet as from a river; ordinarily found on or at the edge of the flood plain or a river; a *Bayou*[4].

sludge, *n* — [HYDROLOGY] *1*. any mixture of SOLIDS that settles out of SOLUTION. Sludges contain LIQUIDS that are not apparent as free LIQUIDS. *2*. a WATER charged SEDIMENTARY DEPOSIT.

> DISCUSSION — the water-formed sedimentary deposit may include all suspended solids carried by the water and trace elements that were in solution in the water. Sludge usually does not cohere sufficiently to retain its physical shape when mechanical means are used to remove it from the surface on which it deposits, but it may be baked in place and be adherent.

sludge, *n* – [TREATMENT TECHNOLOGY] the solid matter removed from wastewater; a concentration of solids thick enough to give its fluid carrier a paste-like consistency. Sludge includes both organic matter, which can be burned, and other matter which cannot[63]. *Also see activated sludge*.

sludge-digestion tank—*See digester.*

sludge-drying bed, *n* – [TREATMENT TECHNOLOGY] a bed on which humus-like residue from the DIGESTER is dried; after being dried, the SLUDGE may be burned or dumped[63].

slug, *n* — [HYDROGEOLOGY] a VOLUME of WATER or solid object used to induce a sudden change of HEAD in a WELL.

sluice, *n* — [HYDROLOGY] *1a*. an artificial CHANNEL for conducting water, with a valve or gate to regulate the flow; *1b*. a valve or gate used in such a channel; a floodgate or sluice gate. *2*. a body of water impounded behind a floodgate. *3*. a sluiceway.

slump, *n* – [GEOLOGY] a form of LANDSLIDE in which a single, large block of bedrock moves downward with backward rotation upon an upwardly concave FRACTURE surface.

slurry, *n* – [CHEMISTRY] a watery mixture of insoluble matter resulting from some pollution control techniques.

slurry wall, *n* – [REMEDIATION TECHNOLOGY] a vertical barrier constructed by excavating a vertical slot under a BENTONITE slurry and backfilling it with materials of low PERMEABILITY for the purpose of the containment of the lateral flow of water and other fluids.

small-quantity generator, *n* – [ENVIRONMENTAL REGULATION] persons or enterprises that produce 220 to 2,200 pounds per month of HAZARDOUS WASTE; they

are required to keep more records than conditionally exempt generators. The largest category of hazardous waste generators, SQGs, include automotive shops, dry cleaners, photographic developers, and many other small businesses. *Also see large-quantity generator.*

smear zone, *n* – [HYDROGEOLOGY] SOILS between the top and bottom of the WATER TABLE that becomes saturated by the GROUND WATER part of the year due to water table fluctuations. This area may become contaminated if contamination is floating on the top of the groundwater or if soil contamination extends into the smear zone.

smelter, *n* -- [INDUSTRIAL TECHNOLOGY] a facility that melts or fuses ore, often with an accompanying chemical change, to separate its metal content. Emissions cause pollution. "Smelting" is the process involved.

smog, *n* – [METEOROLOGY] a FOG containing impurities, mainly nitrogen oxides and VOLATILE ORGANIC COMPOUNDS from domestic fires, industrial furnaces, certain power stations and internal combustion engines.

snow, *n* – [METEOROLOGY] type of PRECIPITATION that forms in air with TEMPERATURES below freezing. Snow forms when water vapor deposits directly as a solid on a deposition nuclei, by passing the liquid state. A snowflake forms first as a very tiny crystal developing on a six-sided hexagonal deposition nuclei. The ice crystal then grows fastest at the six points as these area are more directly exposed to the atmosphere's water vapor. Snow is most common in winter just north of the center of mid-latitude cyclones. As the warm moist air travels around the center of lowest pressure, it overrides colder air located north of the low and is cooled to its saturation temperature, producing rainfall and snow. Snow generally occurs with east winds, since the winds at locations north of a mid-latitude cyclone are from the east. *Also see fog, hail and rain.*

soda ash, *n* – [CHEMISTRY] commercial term for sodium carbonate, Na_2CO_3.

sodium (Na), *n* – [CHEMISTRY] a soft, bright, silvery METALLIC ELEMENT, one of the ALKALI METALS. It is a very reactive element and is never found free in nature. The most common compound is sodium chloride. Sodium compounds are important to the paper, glass, soap, textile, petroleum, chemical, and metal industries.

softwood, *n* – [DENDROLOGY] a conventional term for both timber and TREES belonging to the botanical group GYMNOSPERMS and, in practice, almost restricted to CONIFERS.

soil (earth), *n* — [GEOLOGY] sediments or other unconsolidated accumulations of solid particles produced by the physical and chemical disintegration of rocks, and which may or may not contain organic matter.

soil-cleanup criteria (*pl.*), criterion (*s.*), *n* [ENVIRONMENTAL REGULATION] -- contaminant concentrations in soil that must be met to obtain case closure from a regulatory agency. *Also known as cleanup standards.*

soil depletion, *n* – [AGRONOMY] decrease in soil quality over time. Causes include loss of NUTRIENTS caused by overfarming, EROSION by wind, and chemical imbalances caused by acid rain.

soil-forming factors, *n* — [AGRONOMY] factors, such as PARENT MATERIAL, CLIMATE, VEGETATION, TOPOGRAPHY, ORGANISMS, and TIME involved in the transformation of an original geologic deposit into a soil profile.

soil gas, *n* — [AGRONOMY] *1*. vadose zone atmosphere. *2*. gaseous elements and compounds in the small spaces between particles of the earth and soil. Such gases can be moved or driven out under pressure and samples collected.

soil horizon — *See horizon*.

soil map, *n* – [AGRONOMY] a map designed to show the distribution of soil types or other soil mapping units in relation to other prominent physical and cultural features on the earth's surface. The Soil Conservation Service (SCS), a division of the U. S. Department of Agriculture, produces soil maps for most counties within the USA.

soil mechanics, *n* — [AGRONOMY] the application of the LAWS and PRINCIPLES of MECHANICS and HYDRAULICS to engineering problems dealing with soil as an engineering material.

soil physics, *n* — [AGRONOMY] the organized body of knowledge concerned with the physical characteristics of soil and with the methods employed in their determinations.

soil profile (profile), *n* — [AGRONOMY] vertical section of a soil, showing the nature and sequence of the various layers, as developed by deposition or weathering, or both.

soil stabilization, *n* – [AGRONOMY] treatment of soil to improve its properties; includes the mixing of additives and other means of alterations such as COMPACTION or DRAINAGE.

soil-vapor extraction, *n* – [REMEDIATION TECHNOLOGY] a technology where a vacuum is applied to a well or multiple wells with screened intervals open to the soil which contains contaminants.

soil washing, *n* – [REMEDIATION TECHNOLOGY] a technology that uses water or other liquids to remove contaminants from soils. The process works by either dissolving or suspending contaminants in the wash solution. It is often used in conjunction with other physical separation techniques such as pump-and-treat.

soil-water pressure, *n* — [AGRONOMY] the PRESSURE on the water in a soil-water system, as measured by a PIEZOMETER for a water saturated soil, or by a TENSIOMETER for an unsaturated soil.

sole-source aquifer, *n* – [HYDROGEOLOGY] an AQUIFER that supplies 50-percent or more of the drinking water of an area.

solidification and stabilization, *n* – [TREATMENT TECHNOLOGY] a technology used to prevent the migration of hazardous substances from a site. Generally, contaminated soils are excavated and mixed with concrete or other agents to form solid blocks that are then usually buried at the site. Alternatively, a slurry of binding agents can be injected directly into the ground, where the material fills all available spaces and hardens into a solid mass.

solid phase, *n* – [PHYSICS] a relatively dense, rigid state of MATTER, with a definite VOLUME and shape. MOLECULES in solids are often packed close together in regularly repeating PATTERNS, and vibrate around fixed positions. *Also known as solid state.*

solid waste, *n* – [WASTE DISPOSAL] non-liquid, non-soluble materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes, and mining residues. Technically, solid waste also refers to liquids and gases in containers. *Also see garbage,refuse, rubbish and trash.*

solid waste disposal site, *n* — [WASTE DISPOSAL] a place, location, tract of land, area, or premises used for the disposal of solid wastes as defined by state solid waste regulations. The term is synonymous with the term LANDFILL and is also known as a garbage dump, trash dump, or similar term.

solonchak, *n* – [AGRONOMY] an intrazonal SALINE SOIL found in hot, arid climates.

solonetz, *n* – [AGRONOMY] an intrazonal, formerly SALINE, SOIL.

solstice, *n* – [GEOGRAPHY] the time (21 June or 22 December) at which the overhead sun is furthest from the EQUATOR and appears to stand still before returning towards the equator.

solubility, *n* – [CHEMISTRY] the amount of MASS of a COMPOUND that will dissolve in a unit VOLUME of SOLUTION. Aqueous Solubility is the maximum concentration of a chemical that will dissolve in pure water at a reference TEMPERATURE.

solubility product (K_{sp}), *n* – [CHEMISTRY] the EQUILIBRIUM CONSTANT that describes a SOLUTION of a slightly soluble SALT in WATER[33].

solum, *n* – [AGRONOMY] part of the soil that is capable of supporting life.

solute phase, *n* — [CHEMISTRY] a condition of CONTAMINANT residence in which contaminants are dissolved in ground water in either the saturated or the vadose zone.

solute transport, *n* -- [HYDROGEOLOGY] the movement of dissolved CONSTITUENTS in GROUND WATER.

solute transport model, *n* – [HYDROGEOLOGY] application of a model to represent the movement of chemical species dissolved in GROUND WATER.

solution, *n* – [CHEMISTRY] *1*. an act or the PROCESS by which a SOLID, LIQUID, or GASEOUS SUBSTANCE is HOMOGENEOUSLY mixed with a liquid or sometimes a gas or solid. *2*. a homogeneous mixture formed by this process, especially, a single-phase liquid system. *3*. the condition of being dissolved.

solution channel, *n* – [HYDROGEOLOGY] openings in rock masses formed by moving water carrying away soluble materials.

solvent, *n* — [CHEMISTRY] a CHEMICAL COMPOUND that is capable of dissolving another SUBSTANCE and, potentially, a HAZARDOUS substance, used in a number of manufacturing/industrial processes including but not limited to the manufacture of paints and coatings for industrial and household purposes, equipment clean-up, and surface degreasing in metal fabricating industries.

solvent extraction, *n* – [INDUSTRIAL TECHNOLOGY] an innovative treatment technology that uses a solvent to separate or remove hazardous organic contaminants from oily-type wastes, soils, sludges, and sediments. The technology does not destroy contaminants, but concentrates them so they can be recycled or destroyed more easily by another technology. Solvent extraction has been shown to be effective in treating sediments, sludges, and soils that contain primarily organic contaminants, such as PCBs, VOCs, halogenated organic compounds, and petroleum wastes. Such contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes. Solvent extraction is a transportable technology that can be brought to the site.

solvent mileage, *n* – [DRY CLEANING TECHNOLOGY] the WEIGHT of clothes cleaned per gallon of DRY-CLEANING FLUID used in pounds per gallon.

solvolysis, *n* [CHEMISTRY] generally, a REACTION with a solvent, involving the rupture of one or more BONDS in the reacting SOLUTE. More specifically, the term is used for substitution, elimination, or fragmentation reactions in which a solvent species is the nucleophile (HYDROLYSIS, if the solvent is water or alcoholysis if the solvent is alcohol)[62].

sonic log, *n* – [GEOPHYSICS] measure the acoustic velocity of a rock formation. Sonic log provides a formation's internal transit time. The speed of sound in rock is related to lithology, rock texture, notably porosity. Sonic logs are very useful in integrating seismic data with well log data. As we learned in the last week, the vertical scale of seismic sections is in "two way travel time". Sonic log can be used to change the time scale into depth scale. *Also see electric log, gamma log, gamma-gamma log, induction log, neutron log, resistivity log, sonic log and spontaneous potential log.*

sorbate, *n* — [CHEMISTRY] chemical species sorbed by a SORBENT.

sorbed phase, *n* — [CHEMISTRY] a condition of contaminant residence in which contaminants are adsorbed into the surface of soil particles or absorbed by soil organic matter.

sorbent, *n* — [CHEMISTRY] a substance that sorbs the solute from solution (for example, soil, sediment, till, etc.).

sorption, *n* — [CHEMISTRY] depletion of an amount of solute initially present in solution by a sorbent.

sorting, *n* – [GEOLOGY] *1*. the process by which a given transport medium separates out certain particles, as on the basis of size, shape, or density.

sound, *n* – [GEOGRAPHY] *1*. a long broad inlet of the OCEAN generally PARALLEL to the COAST. *2*. a long passage of WATER connecting two larger bodies (as a SEA with the ocean) or separating a mainland and an ISLAND. *Also see bay and gulf.*

source, *n* — [HYDROGEOLOGY] the location at which contamination has entered the natural environment.

source reduction, *n* – [REMEDIATION TECHNOLOGY] any activity that eliminates or decreases wastes by avoiding their creation, typically by materials substitution, process design, or product redesign.

source water, *n* – [HYDROLOGY] the supply source of water (for example, private wells, public water supply) to a discharger, where the source water becomes part of a discharge.

sour crude, *n* – [PETROLEUM CHEMISTRY] high-sulphur-containing CRUDE OIL. *Also see sweet crude.*

space, *n* – [PHYSICS] *1*. a distance, area, or volume. *2*. an infinite three-dimensional area in which objects have relative coordinates to each other. *3*. the region beyond the outer limits of the Earth's atmosphere.

sphagnum, *n* – [BIOLOGY] a grayish moss growing in dense layers in BOGS, that eventually forms PEAT.

speciation, *n* – [BIOLOGY] the evolutionary formation of a new biological SPECIES, usually the division of a single, existing species into two or more genetically distinct ones.

speciation, *n* – [CHEMISTRY] the distribution of a chemical SPECIES amongst defined chemical species in a system,

species, *n* – [BIOLOGY] *1*. a reproductively isolated aggregate of interbreeding ORGANISMS having common ATTRIBUTES and usually designated by a common name. *2*. an organism belonging to belonging to such a category.

species, *n* – [CHEMISTRY] ATOMS, MOLECULES or molecular fragments, which are entities being subjected to chemical processes or to a measurement.

specific activity, *n* – [CHEMISTRY] the number of radioactive decays that take place per unit mass. In general, this means that a low specific-activity material releases a relatively small amount of radiation[64].

specific capacity, *n* — [HYDROGEOLOGY] [L^2T^{-1}]the RATE of DISCHARGE from a WELL divided by the DRAWDOWN of the water level within the well at a specific TIME since PUMPING started.

specific conductance, *n* – [CHEMISTRY] a measure of the capacity of a water to conduct an electrical current, expressed in microsiemens per centimeter at 25^{o} C.

specific discharge, *n* — [HYDROGEOLOGY] [LT^{-1}] the rate of flow of water through a porous medium per unit area measured at a right angle to the direction of flow.

specific gravity, *n* – [PHYSICS]

- ***specific gravity of solids*** — ratio of: (*1*) the weight in air of a given volume of solids at a stated temperature to (*2*) the weight in air of an equal volume of distilled water at a stated temperature.
- ***apparent specific gravity*** — ratio of: (*1*) the weight in air of a given volume of the impermeable portion of a permeable material (that is, the solid matter including its impermeable pores or voids) at a stated

temperature to (*2*) the weight in air of an equal volume of distilled water at a stated temperature.

- ***bulk specific gravity (specific mass gravity)*** — ratio of: (*1*) the weight in air of a given volume of a permeable material (including both permeable and impermeable voids normal to the material) at a stated temperature to (*2*) the weight in air of an equal volume of distilled water at a stated temperature.

specific heat capacity, *n* – [PHYSICS] the heat capacity of a substance per unit mass.

specific retention, *n* – [HYDROGEOLOGY] the ratio of the volume of water a rock can retain (in spite of gravity) to the total volume of rock. *Also see field capacity.*

specific storage, *n* — [HYDROGEOLOGY] the volume of water released from or taken into storage per unit volume of the porous medium per unit change in head.

specific surface, *n* — [HYDROGEOLOGY] the surface area per unit of volume of soil particles.

specific yield, *n* — [HYDROGEOLOGY] the ratio of the volume of water that the saturated rock or soil will yield by gravity to the volume of the rock or soil. In the field, specific yield is generally determined by tests of unconfined aquifers and represents the change that occurs in the volume of water in storage per unit area of unconfined aquifer as the result of a unit change in head. Such a change in storage is produced by the draining or filling of pore space and is, therefore, mainly dependent on particle size, rate of change of the water table, and time of drainage.

specimen, *n* — [ENVIRONMENTAL INVESTIGATION] pieces or quantity taken or prepared from a sample for testing. *Also see sample.*

spectra (*pl.*), spectrum (*s.*), *n* – [PHYSICS] *1.* a sequence of colors produced by passing light through a prism or diffraction grating. *2.* a range of wavelengths of electromagnetic radiation. *3.* a plot that shows how some intensity-related property of a beam of radiation or particles depends on another property that is related to dispersal of the beam by a prism, a magnet, or some other device. For example, a plot of light absorbance versus wavelength is an absorption spectrum; a plot of ion abundance versus mass is a mass spectrum.

speed of light, *n* – [PHYSICS] VELOCITY of LIGHT in a VACUUM. This velocity is APPROXIMATELY 3 x 10^8 meters per second. It takes light from the sun 8 minutes and 20 seconds to reach the Earth.

speleothem, *n* – [GEOLOGY] a mineral deposit of calcium carbonate that precipitates from SOLUTION in a CAVE.

spent fuel, *n* – [CHEMISTRY] fuel assemblies taken out of a nuclear reactor after a period of useful energy production[64]. *Also referred to as irradiated fuel or used fuel.*

spill bucket, *n* – [UNDERGROUND STORAGE TANK TECHNOLOGY] a device installed at the *fill pipe* and at the *dispenser* to contain the drips and spills of fuel that can occur when the delivery hose is uncoupled from the fill pipe after delivery.

spit, *n* – [GEOLOGY] a narrow, fingerlike ridge of sand that extends from land into open water. *Also known as a sandspit.*

split spoon, *n* – [ENVIRONMENTAL INVESTIGATION] a hollow, metal tube which is inserted into boreholes to collect SOIL SAMPLES. The device splits in two so that the sample can be retrieved.

spoils, *n* – [MINING] waste materials removed from a mining facility that is not considered a useful product[66]. *Also known as spoil material.*

spoliation, *n* – [LAW] destruction of a thing or evidence by the act of a stranger; as, the erasure or alteration of a writing by the act of a stranger, is called spoliation. This has not the effect to destroy its character or legal effect.

spontaneous potential log, *n* – [GEOPHYSICS] one of the oldest logging techniques. It employs very simple equipment to produce a log whose interpretation may be quite complex, particularly in freshwater aquifers. This complexity has led to misuse and misinterpretation of spontaneous potential (SP) logs for groundwater applications. The spontaneous potential log (incorrectly called self potential) is a record of potentials or voltages that develop at the contacts between shale or clay beds and a sand aquifer, where they are penetrated by a drill hole. *Also see electric log, gamma log, gamma-gamma log, induction log, neutron log, resistivity log and sonic log.*

spring, *n* – [HYDROGEOLOGY] GROUND WATER seeping out of the earth where the water table intersects the ground surface.

spring, artesian, *n* – [HYDROGEOLOGY] water flowing under ARTESIAN PRESSURE with the POTENTIOMETRIC SURFACE above the land surface.

spring, barrier, *n* – [HYDROGEOLOGY] a subsurface barrier forcing water to rise to ground surface and discharge as a spring.

spring overturn, *n* – [HYDROLOGY] a physical phenomenon that may take place in a body of water during the early spring. The sequence of events leading to spring overturn include: *1.* melting of ice cover; *2.* warming of surface water; *3.* density

changes in surface waters producing convection currents; *4*. circulation of the total water volume by wind action, and *5*. vertical temperature homogenization. The overturn mixes the water mass and results in a lake that is physically and chemically more uniform.

spring tide, *n* – [HYDROLOGY] TIDE with large amplitude at the times of full moon and new moon.

square number, *n* – [MATHEMATICS] a number of the form n^2; a number multiplied by itself.

square root, *n* – [MATHEMATICS] the number *x* is said to be a square root of *y* if $x^2 = y$.

stability, *n* – [PHYSICS] the quality or act of being firmly fixed or established, not easily adjusted, destroyed or altered.

stabilization, *n* – [TREATMENT TECHNOLOGY] a process for treating a WASTE to minimize an undesirable attribute of that waste; the treating of solids from wet scrubbing or other air POLLUTION control processes; FLY ASH is often used as a reagent or filler.

stable, *adj* -- [Chemistry] expresses a thermodynamic property, which is quantitatively measured by relative molar standard Gibbs energies. A chemical species A is more stable than its isomer B if $\Delta rGo > 0$ for the (real or hypothetical) reaction A → B, under standard conditions[62].

stable isotope, *n* – [ISOTOPES] an ISOTOPE that does not emit RADIATION such as ^{13}C or ^{18}O. *Also see radioisotope.*

stable carbon isotope ratio, *n* -- [ISOTOPES] relative amount of ^{13}C versus ^{12}C in organic matter. This ratio can be used to fingerprint different types of contaminant releases, for example, gasoline discharges. A bulk value can be obtained for a product, such as gasoline, or a compound-specific value can be determined for specific constituents in the product.

stable plume, *n* – [HYDROGEOLOGY] configuration where the solute plume margin is stationary over time and concentrations at points within the plume are relatively uniform over time or may decrease over time.

stablization pond—*See sewage lagoon.*

stage, *n* – [HYDROLOGY] the elevation of the WATER surface in a STREAM CHANNEL.

stagnation point, *n* – [HYDROGEOLOGY] the foremost point on a streamline dividing an area of pumping depression from a zone of influence in a tilted AQUIFER being pumped by a well.

staining, *n* – [PHYSICS] discoloration by the action of LIQUID sinking in or some foreign matter.

stand, *n* – [DENDROLOGY] a group of growing plants.

standard deviation (σ), *n* – [STATISTICS] a STATISTICAL measure of the spread of the DATA where,

$$\sigma = \sqrt{[\Sigma(x_i - x)^2/n]}$$

n is the number of items in the data set, x is the mean value and x_i is the value of each item.

standard error, *n* – [STATISTICS] the potential difference between the MEAN value calculated from a sample of a DATA set, and the mean value of the total POPULATION of the data set.

standard of proof, *n* – [LAW] the amount of evidence which a plaintiff (or prosecuting attorney, in a criminal case) must present in a trial in order to win is called the standard of proof. Different cases require different standards of proof depending on what is at stake. The common standards are:

> ***beyond a reasonable doubt (criminal cases)--***for a criminal defendant to be convicted of a crime, the prosecutor must prove her case to the point that the jurors have no reasonable doubts in their minds that the defendant did whatever he is charged with having done.
>
> ***clear and convincing evidence (civil cases involving the potential loss of important interests) --*** for a party to prove a case under this standard, he or she must show something more than it is more likely than not, but not as much as beyond a reasonable doubt. No legal scholar has ever been able to define clear and convincing evidence more precisely than that.
>
> ***preponderance of the evidence (most civil cases)--***preponderance of the evidence generally means that a party will win if he or she can show that it is more likely than not that her contention is true.

standard sea level pressure, *n* -- [METEOROLOGY] average height of the MERCURY column in a mercurial barometer: 76 centimeters, 29.92 inches or 1,013.2 millibars.

state, *n* – [LAW] *1*. a self-sufficient body of persons united together in one community for the defence of their rights, and to do right and justice to foreigners. In this sense, the state means the whole people united into one body politic; and the state, and the people of the state, are equivalent expressions. *2*. an organized, political community under one GOVERNMENT, a commonwealth, a nation.

state, *n – 1*. a condition or stage in the physical being of something.

statement, *n* – [LAW] an expression in WORDS; a declaration.

state of the art technology, *n* -- up-to-date TECHNOLOGY reflected in equipment or procedures that, when applied at a major facility, will result in a significant reduction in the probability of a contaminant discharges. For example, the concept of state-of-the-art technology would represent an advancement in reduction of leaks or discharges and could be demonstrated at a similar facility to be reliable in commercial operation or in a pilot operation on a scale large enough to be translated into commercial operation. The technology shall be in the public domain at reasonable cost commensurate with the reduction in probability of leaks or discharges achieved, or otherwise available at reasonable cost commensurate with the reduction in probability of leaks or discharges achieved.

static pressure, *n* – [HYDROGEOLOGY] [$ML^{-1}T^{-2}$] the pressure exerted by a fluid. It is the mean normal compressive stress on the surface of a small sphere around a given point[65].

static water level, *n* — [HYDROGEOLOGY] the ELEVATION of the top of a column of WATER in a MONITORING WELL or PIEZOMETER that is not influenced by PUMPING or conditions related to well installation, HYDROLOGIC TESTING, or nearby pumpage.

static, *adj* – [PHYSICS] of FORCE acting by WEIGHT without MOTION, as opposed to DYNAMIC. *Also see dynamic.*

statics, *n* – [PHYSICS] SCIENCE of bodies at rest or of forces in EQUILIBRIUM.

statistics, *n* – [MATHEMATICS] branch of MATHEMATICS dealing with the collection, ANALYSIS, interpretation, and presentation of masses of numerical DATA.

> DISCUSSION – Churchill once said that there are three types of lies: lies, damned lies and statistics.

Also see algebra, calculus, geometry, geostatistics and mathematics.

statute, *n* – [LAW] a formal written enactment of a legislative body, whether federal, state, city or county; an act of the legislature declaring, commanding or prohibiting something.

statute of limitations, *n* – [LAW] LAWS setting deadlines for filing lawsuits within a certain time after events occur that are the source of a claim. These deadlines vary depending on the state, the type of issue and the circumstances of the case. A lawsuit filed after the deadline will be thrown out of court.

steady-state, *adj* – [PHYSICS] a type of EQUILIBRIUM where the average condition of the system remains unchanged over time.

steady state flow, *n* – [HYDROGEOLOGY] a characteristic of a GROUND WATER or VADOSE ZONE flow system where the magnitude and direction of specific discharge at any point in space are constant in time. *Also known as steady flow. Also see uniform flow and unsteady-state flow.*

steady state model, *n* – [HYDROGEOLOGY] a numerical model in which model stresses do not vary over time. A steady state model is run until the modeled basin is in equilibrium and no more changes in potentiometric head are calculated.

steam, *n* – [PHYSICS] a vapor arising from a heated substance; the invisible vapor into which water is converted when heated to the boiling point; the mist formed by the condensation on cooling of water vapor.

steam cracker, *n* – [PETROLEUM CHEMISTRY] a PETROCHEMICAL plant, often associated with a refinery, that produces OLEFINS, particularly ethylene, and, in some cases, AROMATICS.

stem, *n* – [BIOLOGY] in a plant, the aboveground conducting portion, with a specific anatomic structure.

step-drawdown test, *n* — [HYDROGEOLOGY] a test in which a control well is pumped at constant rates in "steps" of increasing discharge. Each step is approximately equal in duration, although the last step may be prolonged. A step-drawdown test is often conducted immediately before a long-term pumping test to determine the sustainable yield of the aquifer and consequently choose a pumping rate for the test.

step faults, *n* – [GEOLOGY] a series of PARALLEL FAULTS each having movement in the same direction but with an increasing THROW from the top to bottom.

steppe, *n* – [GEOGRAPHY] Russian term for mid-LATITUDE grasslands.

steranes, *n* – [FINGERPRINTING] BIOMARKERS found in CRUDE OIL derived from the sterols of cell membranes of eukaryotes, mainly algae and higher plants. Composed of saturated biomarkers constructed of six isoprene units ($\sim C_{30}$)[34]. These biomarkers are often used to fingerprint spilled crude oils and heavier refined petroleum products.

stereochemistry, *n* – [CHEMISTRY] the three-dimensional relationship of atoms within a molecule[34].

stereoisomers, *n* – [CHEMISTRY] COMPOUNDS that have the same MOLECULAR FORMULA and the same linkage between ATOMS but different spatial arrangements of the atoms, typically around an asymmetric carbon atom. Stereoisomers include ENANTIOMERS (mirror-

image structures) and diasteromers (epimers), which differ at certain asymmetric centers but are identical at others[34]. *Also see enantiomers*.

stereoscope, *n* – [REMOTE SENSING] a type of binocular used to create a three-dimensional image from two photographs, usually AERIAL PHOTOGRAPHS, taken at different angles but of the same area.

sterile, *adj* — [BIOLOGY] free from any viable ORGANISM, either active or dormant.

Stiff Diagram, *n* – [CHEMISTRY] a visual METHOD to compare the relative proportions of IONS in water. Ion CONCENTRATIONS in milligrams per liter (mg/l) are converted to millequivalents per liter (meq/l). CATIONS (positively charged ions) are plotted on the left side of the DIAGRAM, with ANIONS (negatively charged ions) plotted on the right. The length of the diagram vertices are proportional to ionic content. Different ion combinations can be plotted in Stiff diagrams depending on AQUEOUS GEOCHEMISTRY, and on what the author wants to demonstrate.

stigma, *n* – [INSURANCE] the residual loss in value above and beyond the actual cost to cure or control the environmental condition of concern if such extraordinary loss is evident in the marketplace. Stigma generally is a result of uncertainty as to the cost, effectiveness or permanency of the methodology of cure/control, or uncertainty concerning the environmental regulatory agencies' endorsement of such methodology or results. Stigma is a time-dependent phenomena and as such may be only temporary in effect.

still gas, *n* -- [PETROLEUM CHEMISTRY] any form or mixture of gases produced in refineries by DISTILLATION, CRACKING, REFORMING, and other processes. Principal constituents are METHANE, ETHANE, ethylene, normal butane, butylene, PROPANE, propylene, etc. Used as a refinery fuel and as a PETROCHEMICAL FEEDSTOCK.

stochastic, *adj* – [STATISTICS] governed by the laws of *probability*. *Also see probability and statistics.*

stochastic hydrology, *n* – [HYDROLOGY] HYDROLOGICAL PROCESSES and PHENOMENA which are described and analysed by the METHODS of PROBABILITY THEORY.

stochastic model, *n* – [STATISTICS] a MODEL which shows probability changes through time.

stock, *n* – [GEOLOGY] a small PLUTON, with a surface exposure area of less than 40 square miles (or about 100 square kilometers).

Stoddard solvent, *n* – [PETROLEUM CHEMISTRY] a colorless, flammable liquid that smells and tastes like kerosene. It will turn into a vapor at temperatures of 150° to 200 °C. It is a petroleum mixture that is also known as dry cleaning safety solvent, petroleum solvent, and varnoline; its registered trade names are Texsolve S® and Varsol 1®. It is a chemical mixture that is similar to white spirits. Stoddard solvent is used as a paint thinner; in some types of photocopier toners, printing inks, and adhesives; as a dry cleaning solvent; and as a general cleaner and degreaser.

stoichiometry, *n* – [CHEMISTRY] *1.* ratios of ATOMS in a COMPOUND. *2.* ratios of MOLES of compounds in a reaction. *3.* a branch of CHEMISTRY that quantitatively relates amounts of ELEMENTS and compounds involved in CHEMICAL REACTIONS, based on the law of conservation of mass and the law of definite proportions.

Stoke's Law, *n* – [HYDROLOGY] a FORMULA expressing the rates of settling of spherical particles in a fluid. Gives the rate of fall of a small sphere in a viscous fluid. When a small sphere falls under the action of gravity through a viscous medium, it ultimately acquires a constant velocity, V, where,

$$V = 2g\alpha^2 (d_1 - d_2)/9\varepsilon$$

and g is gravitational acceleration, a is the radius of the sphere, d_1 and d_2 are the densities of the sphere and of the medium, respectively, and ε is the coefficient of viscosity. V will be in centimeters per second if g is in centimeters per second per second; *a* will be in centimeters; d_1 and d_2 will be in grams per cubic centimeter; and ε will be in dynes second per square. *Also see sedimentology.*

stone, *n* — [GEOLOGY] crushed or naturally angular particles of ROCK.

storage coefficient, *n* — [HYDROGEOLOGY] the volume of water an AQUIFER releases from or takes into storage per unit surface area of the aquifer per unit change in head. For a confined aquifer, the storage coefficient is equal to the product of the specific storage and aquifer thickness. For an unconfined aquifer, the storage coefficient is approximately equal to the specific yield.

storativity — *See storage coefficient*

storm sewer, *n* – [HYDROLOGY] a system of pipes (separate from SANITARY SEWERS) that carries water runoff from buildings and land surfaces.

storm water, *n* – [HYDROLOGY] water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt. The water seeps into the ground or can drain into storm sewers. These are drains along street corners or at low points on the sides of streets. Collectively, the draining water is called storm water runoff and is

a concern in commercial and industrial sites as well as residential neighborhood because of the pollutants it carries. When it rains, oil, antifreeze, detergents, pesticides and other pollutants get washed from driveways, backyards, parking lots, and streets into storm drains and then directly to surface-water bodies. *Also see runoff and storm sewer.*

stoss and lee topography, *n* – [GEOLOGY] a glaciated LANDSCAPE where the LANDFORMS facing up-glacier show erosion while their lee sides show a degree of protection from GLACIAL EROSION.

straight-run gasoline, *n* – [PETROLEUM CHEMISTRY] GASOLINE produced by the primary DISTILLATION of CRUDE OIL. It contains no cracked, polymerized, alkylated, reformed, or visbroken stock.

straight-run refinery products, *n* – [PETROLEUM CHEMISTRY] distillation cuts from crude oil feedstock that include gasoline (C_5 – C_{10}), kerosene (C_{11}-C_{13}), diesel (C_{14}-C_{18}), heavy gas oil (C_{19}-C_{25}), lubricating (C_{26}-C_{40}) and residuum (>C_{40}). The carbon number ranges are approximate and differ depending on specific distillation columns[34].

strain, *n* – [PHYSICS] general term for the DEFORMATION of a solid by bending or volume change when stress is applied. *Also see stress.*

strait, *n* – [GEOGRAPHY] a comparatively narrow passageway connecting two large bodies of water. *Also see channel and narrows.*

strandline, *n* – [GEOLOGY] a relict feature where there used to be a BEACH when large glacial lake(s) occupied the lowlands during glaciations. These lines are now visible as wave-cut terraces where the former beach waves eroded and deposited a steep terrace riser and a flat terrace tread.

strang , *n* – [GEOLOGY] a low PEAT RIDGE.

strata (*pl.*), stratus (*s.*), *n* – [GEOLOGY] the LAYERS or beds found in SEDIMENTARY ROCK. *Also see bed, layer and seem.*

strath, *n* – [GEOGRAPHY] a broad VALLEY.

stratified drift, *n* – [GEOLOGY] SEDIMENTS deposited by glacial meltwater that are sorted and layered; a major subdivision of glacial drift that includes river, lake, and marine deposits

stratified sampling, *n* – [ENVIRONMENTAL INVESTIGATION] samples are selected according to some known background characteristic in the statistical population.

stratigraphic column, *n* – [GEOLOGY] a chronologic succession of sedimentary rocks from older below to younger above, essentially without interruption; such as a sequence of bedded rocks of interregional scope, bounded by unconformities.

stratigraphy, *n* – [GEOLOGY] study of the formation, composition, and sequence of sediments, whether consolidated or not.

streak, *n* – [MINERALOGY] the color of a MINERAL in its powder form and is obtained by rubbing the mineral across a plate of unglazed porcelain.

stream, *n* – [HYDROLOGY] a body of water found on the Earth's surface and confined to a narrow topographic depression, down which it flows and transports rock particles, sediment, and dissolved particles. Rivers, creeks, brooks, and runs are all streams. *Also see brook, creek, river and run***.**

> ***annular stream* –** streams forming a pattern of of incomplete concentric circles.
>
> ***consequent stream*** – stream that takes its course down the slope of an initial landform, such as a newly emerged coastal plain or volcano.
>
> ***graded stream*** – stream with its gradient adjusted to achieve a balanced state in which the average bed load transport rate is matched to the average bed load input rate.
>
> ***radial stream*** – streams flowing radially outward from a central peak or highland such as a sedimentary dome or volcano.
>
> ***subsequent stream*** – stream that develops its course by stream erosion along a band or belt of less resistant rock.

stream capture, *n* – [HYDROLOGY] a process of EROSION where one stream erodes headward, diverting some of another stream's drainage into its own channel. *Also called stream piracy.*

stream depletion, *n* – [HYDROLOGY] a decrease in river gains or an increase in river losses resulting from a change in the WATER TABLE.

stream gage, *n* – [HYDROLOGY] a station established to measure FLOW in a RIVER or STREAM.

stream order, *n* – [HYDROLOGY] the numbering of STREAMS in a network.

streamside management zone (SMZ), *n* – [ENVIRONMENTAL REGULATION] an area of varying width adjacent to a watercourse in which special management precautions are necessary to protect natural resources.

stress, *n* – [PHYSICS] *1*. pressure or tension exerted on a material object. *2*. a demand on physical or mental energy. *Also see strain.*

stressors, *n* – [ECOLOGY] PHYSICAL, CHEMICAL, or BIOLOGICAL entities that can induce adverse effects on ecosystems or human health.

striation, *n* – [GEOLOGY] a long scratch on a ROCK surface often caused by GLACIAL SCOUR.

strict liability, *n* – [ENVIRONMENTAL REGULATION] a concept under CERCLA that empowers the Federal government to hold PRPs liable without proving that the PRPs were at fault and without regard to a PRP's motive. PRPs can be found liable even if the problems caused by the release of a hazardous substance were unforeseeable, the PRPs acted in good faith, and state-of-the-art hazardous waste management practices were used at the time the materials were disposed of. *Also see potential responsible party.*

strike, *n* — [GEOLOGY] the direction or AZIMUTH of a horizontal line in the plane of an inclined STRATUM, joint, fault, cleavage plane, or other planar feature within a rock mass. *Also see dip.*

strike fault, *n* – [GEOLOGY] a FAULT with a strike parallel to the strike of the strata involved. *Also see strike-slip fault.*

strike-slip fault, *n* – [GEOLOGY] a FAULT in which two sections of rock have moved horizontally in opposite directions, parallel to the line of the FRACTURE that divided them. Strike-slip faults are caused by shearing stress. *Also see normal fault, reverse fault,strike fault, thrust fault and transform fault.*

strike valley, *n* – [GEOLOGY] a VALLEY aligned with the STRIKE of the rocks in which it lies.

string bog, *n* – [HYDROLOGY] a marshy area containing ridges of PEAT in a PERIGLACIAL area. *Also see bog, fen, marsh and swamp.*

strip mining, *n* – [MINING] the process of removing mineral deposits that are found close enough to the surface so that the construction of tunnels (underground mining) is not necessary. The soil and strata that cover the deposit are removed to gain access to the mineral deposit. The primary environmental concerns related to this technique are the disposition of spoils removed to gain access to the deposit and the scoring of the landscape that remains following the complete removal of the mineral deposit. Water pollution is also a concern because runoff from the mining area is frequently rich in sediments and minerals.

structural fill, *n* — [CONSTRUCTION] man-made deposits of solid materials. Examples include backfills, landfills, embankments, earth dams, linings and blankets, foundations, canals, road base, footings, and trenches.

structural geology, *n* – [GEOLOGY] the branch of geology that deals with the form, arrangement, and internal structure of the rocks, and esp. with the description, representation, and analysis of structures, chiefly on a moderate to small scale. The subject is similar to tectonics, but the latter is generally used for the broader regional or historical phases.

structural isomers, *n* – [CHEMISTRY] MOLECULES that have the same molecular formula but different linkages between atoms, such as *n*-butane and isobutene. STEREOISOMERS are a special form of structural isomers[34].

structure, *n* — [GEOLOGY] one of the larger features of a rock mass, like BEDDING, FOLIATION, JOINTING, CLEAVAGE, or brecciation; also the sum total of such features as contrasted with TEXTURE. Also, in a broader sense, it refers to the structural features of an area such as ANTICLINES or SYNCLINES. *Also see structural geology.*

structure, *n* — [AGRONOMY] the arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are; PLATY (laminated), PRISMATIC (vertical axis of aggregates longer than horizontal), COLUMNAR (prisms with rounded tops), BLOCKY (angular or subangular), and GRANULAR. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Student's T-Test, *n* – [STATISTICS] a statistical test of the NULL HYPOTHESIS that the means of two normally distributed POPULATIONS are equal. All such tests are usually referred to as Student's *t*-tests, though strictly speaking that name should only be used if the variances of the two populations are also assumed to be equal; the form of the test used when this assumption is dropped is sometimes called Welch's t-test. *Also see statistics.*

subaerial, *adj* – [GEOLOGY] occurring on LAND at the earth's surface, as opposed to under water or underground.

subbase, *n* — [CONSTRUCTION] a layer used in a pavement system between the subgrade and base coarse, or between the subgrade and portland cement concrete pavement.

subcontinent, *n* – [GEOGRAPHY] a large landmass smaller than a CONTINENT, especially, a major subdivision of a continent such as the Indian subcontinent.

subdrain, *n* – [HYDROLOGY] a pervious backfilled trench containing a pipe or stone for the purpose of intercepting ground water or seepage[66].

subgrade, *n* — [CONSTRUCTION] the soil prepared and compacted to support a structure or a pavement system.

subgrade surface, *n* — [CONSTRUCTION] the SURFACE of the EARTH or ROCK prepared to support a structure or a pavement system.

subjective, *adj* – [LOGIC] depending on personal TASTE or reviews, not objective. *Also see bias and objective.*

sublimation, *n* – [PHYSICS] *1*. the TRANSFORMATION of a SOLID to the GASEOUS PHASE without passing through the normally intermediate LIQUID phase. *2*. the change of a solid to a VAPOR (or the reverse) without the appearance of a liquid state, as in the changing of SNOW directly into water vapor without MELTING.

submersible pump – *See centrifugal pump.*

subpoena, *n* – [LAW] an order directed to an individual commanding him or her to appear in court on a certain day to testify or produce documents in a pending LAWSUIT.

subpoena duces tecum, *n* – [LAW] a command to a witness to produce documents.

subrogation, *n* – [INSURANCE] the legal process by which an insurance company, after paying a loss, seeks to recover the amount of the loss from another party who is legally liable for it.

subsidence, *n* – [GEOLOGY] the lowering of the EARTH'S SURFACE, caused by such factors as COMPACTION, a decrease in GROUND WATER, or the PUMPING of OIL.

sub-slab ventilation system, *n* – [REMEDIATION TECHNOLOGY] an engineering control used to capture vapors emanating from subsurface contamination before those vapors enter a building. Perforated pipes are installed beneath a building foundation (or "slab") to capture and funnel harmful vapors that arise from volatile contaminants beneath a building. In a passive system, the vapors simply follow the pipes to the outside air. In an active system, a fan or blower is attached to the pipes to speed the removal of the vapors.

subsoil, *n* — [AGRONOMY] *1*. soil below a subgrade of fill. *2*. that part of a soil profile occurring below the "A" horizon.

substance, *n* – [CHEMISTRY] *1*. PHYSICAL MATERIAL from which something is made or which has discrete existence. *2*. matter of particular or definite CHEMICAL constitution.

substrate, *n* – [AGRONOMY] the layer of material beneath the surface soil.

substrate, *n* – [BIOLOGY] *1*. the SUBSTANCES used for food by MICROORGANISMS in LIQUID SUSPENSION, as in wastewater treatment. *2*. the physical surface upon which an ORGANISM lives; *3*. the surface, natural or artificial, upon which an organism grows or to which it is attached. *4*. a compound that microorganisms can use in the CHEMICAL REACTIONS catalyzed by their enzymes.

subsurface barrier wall, *n* – [REMEDIATION TECHNOLOGY] an engineering control used to block the flow of contaminated GROUND WATER. Generally, solid metal sheets are driven into the ground to block the groundwater. Alternatively, a liquid substance can be injected into the ground, where it fills all available spaces and hardens into an impermeable barrier.

subterranean, *adj* – [GEOLOGY] existing, occurring or done beneath the EARTH'S surface.

subterranean estuary, *n* – [HYDROLOGY] the location where terrestrially-derived, fresh ground water and sea water interact in coastal aquifers[60].

suction, *n* – [PHYSICS] the act or process of drawing in a certain direction by placing a VACUUM or partial vacuum.

suffosion, *n* – [HYDROLOGY] undermining through removal of sediment by mechanical and corrosional action of underground water.

sulfate reducer, *n* – [BIOLOGY] a MICROORGANISM that exists in ANAEROBIC ENVIRONMENTS and reduces sulphate to hydrogen sulphide.

sulphur (S), *n* – [CHEMISTRY] ELEMENT number 32, pale-yellow, non-metallic element which burns with a blue flame and a suffocating odor. Spelled *sulfur* in the UK. *Also see low-sulphur distillate fuel oil, low-sulphur no. 2 diesel fuel, high-sulphur distillate fuel oil, high-sulphur no. 2 diesel fuel and ultra-low-sulphur distillate fuel oil.*

sulphur hexafluoride (SF_6), *n* – [AGE DATING] an industrial CHEMICAL that is present in the atmosphere generally at low concentrations, but is highly resistant to degradation and can be used as a useful TRACER for tropospheric, stratospheric, oceanic, and ground-water studies. Also known as an "anthropogenic tracer". In particular, it can be used to estimate the age of GROUND-WATER RECHARGE. A very powerful greenhouse gas used primarily in electrical transmission and distribution systems and as a dielectric in electronics. *Also see chlorofluorocarbons (CFCs), krypton-85 and tritium.*

sulphur bacteria, *n* – [MICROBIOLOGY] bacteria that oxidize sulphur compounds,precipitating sulphur or producing noxious sulphur gases such as hydrogen sulphide.

sumidero , *n* – [GEOLOGY] *from Spanish, 1*. a swallow hole. *2*. in Latin America, any closed depression caused by solution.

summary judgment, *n* – [LAW] a DECISION made on the basis of STATEMENTS and EVIDENCE presented for the record without a TRIAL. It is used when there is no

dispute as to the facts of the case, and one party is entitled to judgment as a matter of law.

summit, *n* – [GEOGRAPHY] the flattish top of an erosional fan remnant, hill, mountain, etc. The term is used for both a landform element and a slope component.

summons, *n* – [LAW] a legal document that notifies a party that a lawsuit has been initiated and states when and where the party must appear to answer the charges. A notice to the defendant requiring him to serve an answer to the complaint.

sump, *n* — [HYDROLOGY] a PIT, CISTERN, CESSPOOL, or similar receptacle where liquids drain, collect, or are stored.

Superfund, *n* – [ENVIRONMENTAL REGULATION] the program operated under the legislative authority of CERCLA and SARA that funds and carries out EPA solid waste emergency and long-term removal and remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority, and conducting and/or supervising cleanup and other remedial actions. *Also see CERCLA and SARA.*

superimposed stream, *n* — [HYDROLOGY] a STREAM whose present course was established on young rocks burying an old surface. With uplift, this course was maintained as the stream cut down through the young rocks to and into the old surface.

superimposed valley, *n* – [GEOLOGY] a VALLEY established on the land surface with a pattern that is independent of the underlying rock structure.

supernatant, *n* – [WASTE DISPOSAL] the clear fluid that is removed or drains from the top of SEPTIC TANKS or PONDS used to allow solids to settle from suspension.

supersaturate, *v* — [CHEMISTRY] *1*. to cause (a chemical solution) to be more highly concentrated than is normally possible under given conditions of temperature and pressure. *2* to cause (a vapor) to exceed the normal saturation vapor pressure at a given temperature.

suppressed trees, *n* – [DENDROLOGY] older, slow growing smaller trees in the FOREST UNDERSTORY whose growth are slowed by the larger trees around them.

Supreme Court, *n* – [LAW] the highest JUDICIAL COURT in a NATION.

surface, *n* – [PHYSICS] the exterior or upper BOUNDARY of an object or body. *Also see interface.*

surface impoundment, *n* – [WASTE DISPOSAL] TREATMENT, storage, or disposal of LIQUID HAZARDOUS WASTES in artificial PONDS. *Also see impoundment and pond.*

surface mining, *n* – [MINING] the process of removing mineral deposits that are found close enough to the surface so that the construction of tunnels (underground mining) is not necessary. The soil and strata that cover the deposit are removed to gain access to the mineral deposit. The primary environmental concerns related to this technique are the disposition of spoils removed to gain access to the deposit and the scoring of the landscape that remains following the complete removal of the mineral deposit.

surface tension, *n* — [PHYSICS] a PROPERTY arising from the MOLECULAR forces of the SURFACE FILM of all liquids tend to alter the contained VOLUME of which LIQUID into a form of minimum superficial area, expressed as work in newtons per millimeter. *Also see interfacial tension.*

surface water, *n* – [HYDROLOGY] *1*. an open body of WATER such as a STREAM, LAKE, or RESERVOIR. *2*. water that remains on the earth's surface; all waters whose surface is naturally exposed to the ATMOSPHERE, for example, RIVERS, lakes, reservoirs, PONDS, streams, IMPOUNDMENTS, SEAS, ESTUARIES, etc., and all SPRINGS, WELLS, or other collectors directly influenced by surface water. *3*. a source of drinking water that originates in rivers, lakes and run-off from melting snow. It is either drawn directly from a river or captured behind DAMS and stored in reservoirs. (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.)

surfactant, *n* – [CHEMISTRY] a detergent COMPOUND that promotes lathering. Can be used in remedial efforts to help remove CONTAMINANTS from within SOILS.

surrogate, *n* — [CHEMISTRY] a SUBSTANCE with PROPERTIES that mimic the performance of the ANALYTE of interest in the MEASUREMENT SYSTEM, but which is not normally found in the SAMPLE of concern and is added for QUALITY CONTROL purposes.

surrogate recovery, *n* – [CHEMISTRY] SURROGATES are often added to BLANKS, SAMPLES, MATRIX SPIKES, matrix spike duplicates, and STANDARDS to evaluate the performance of the ANALYTICAL SYSTEM. The amount detected in comparison to the amount introduced is the percent recovery.

suspension, *n* – [CHEMISTRY] the act of sustaining solid particles or a body in a fluid medium somewhere between top and bottom.

sustainability, *n* – [ECOLOGY] management practices that do not take more from an ecosystem than it can provide. Theoretically, sustainable management

practices can continue in perpetuity, since they do not lead to exhaustion of natural resources.

sustained yield, *n* – [HYDROGEOLOGY] the rate at which water can be withdrawn from an AQUIFER without depleting the supply.

swale, *n* – [GEOGRAPHY] *1*. a slight DEPRESSION, sometimes swampy, in the midst of generally level land. *2*. a shallow depression in an undulating GROUND MORAINE due to uneven glacial deposition. 3. a long, narrow, generally shallow, troughlike depression between two beach ridges, and aligned roughly parallel to the coastline. *4*. a piece of MEADOW, often a slight depression or VALLEY, as in a PLAIN or MOOR, marshy and rank with vegetation. Swales usually carry flows only during or immediately after rainfall or snowmelt events. Swales vary in size from small conveyances providing drainage along roadways and behind or between buildings to larger waterways.

swallow hole, *n* – [HYDROLOGY] the point at which a surface stream disappears in LIMESTONE TERRAIN prior to commencing its journey underground[6]. *Also known as a water sink. Also see abîme, gouffre and pothole.*

swamp, *n* — [HYDROLOGY] a FORESTED or shrub covered WETLAND where standing or gently flowing water persists for long periods on the surface. *Also see bog, fen, marsh and wetland*.

swash, *n* – [HYDROLOGY] *1*. a narrow CHANNEL through which TIDES flow. *2*. a BAR over which waves wash freely.

swathe, *n* – [REMOTE SENSING] a strip of the earth's surface scanned by an orbiting sensor.

sweet crude, *n* – [PETROLEUM CHEMISTRY] low-SULPHUR-containing CRUDE OIL. *Also see sour crude.*

sweetening processes, *n* – [PETROLEUM TECHNOLOGY] the removal of a particular class of SULPHUR-containing compounds called MERCAPTANS during PETROLEUM REFINING. Mercaptans are undesirable because they are corrosive and also because of their offensive odor. Several processes have been developed to remove mercaptans by converting them to disulfides. These disulfides are not corrosive and their odors are not as strong as the mercaptans they replace.

syenite, *n* – [GEOLOGY] a group of PLUTONIC ROCKS containing alkali feldspar (usually orthoclase, microcline, or perthite), a small amount of plagioclase (less than in "monzonite"), one or more mafic minerals (esp. hornblende), and quartz, if present, only as an accessory; also, any rock in that group; the intrusive equivalent of "trachyte." With an increase in the quartz content, syenite grades into "granite."

symbol, *n* – [SCIENTIFIC METHOD] *1*. a thing conventionally regarded as typifying, representing or recalling something, especially an idea or quality. *2*. a mark or character taken as the conventional sign of some object, idea, function or process.

symmetrical fold, *n* – [GEOLOGY] where both limbs of a FOLD dip away from the axis at the same angle.

synclinal valley, *n* – [GEOLOGY] a VALLEY formed by a down FOLD of the underlying rocks.

syncline, *n* – [GEOLOGY] a CONCAVE FOLD, the central part of which contains the youngest section of *rock*. *Also see anticline*.

synecology, *n* – [ECOLOGY] the study of many ORGANISMS and their surrounding ENVIRONMENT. *Also see autecology.*

synergism, *n* – [CHEMISTRY] an interaction of two or more CHEMICALS that results in an effect greater than the sum of their separate EFFECTS.

synergistic pollution, *n* – [ENVIRONMENTAL SCIENCE] the combined effect of two or more toxic substances acting together that is more adverse than their sum would be if each were acting separately or independently[63].

synoptic studies, *n* – [ENVIRONMENTAL INVESTIGATION] short-term INVESTIGATIONS of specific water-quality conditions during selected seasonal or HYDROLOGIC periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

syntax, *n* – [GRAMMAR] the way in which linguistic elements (as words) are put together to form constituents (as phrases or clauses).

synthesis, *n* -- [SCIENTIFIC METHOD] the PROCESS or RESULT of building up separate elements, especially ideas into a connected whole., especially into a THEORY or SYSTEM.

synthetic, *adj* – [CHEMISTRY] of, relating to, or produced by CHEMICAL or BIOCHEMICAL SYNTHESIS, especially, produced ARTIFICIALLY. *Also see man-made and natural.*

synthetic fuels, *n* – [PETROLEUM CHEMISTRY] COMBUSTIBLE FLUIDS made from COAL or other HYDROCARBON-containing SUBSTANCES[34].

synthetic organic chemicals (SOCs), *n* – [CHEMISTRY] man-made (ANTHROPOGENIC) ORGANIC CHEMICALS. Some SOCs are VOLATILE; others tend to stay dissolved in WATER instead of evaporating.

system, *n* – [SCIENTIFIC METHOD] a set of interrelated COMPONENTS working together towards some kind of PROCESS.