

APPENDIX C

GLOSSARY

Many of the terms included in this manual have specific regulatory definitions within existing state or federal laws or rules, or may be used as common terms in the environmental field. Manual users should review the definitions presented below prior to reviewing the remainder of the guidance.

access by general public restricted	site is not accessible to the general public due to some form of full-time permanent barrier (e.g., a locking gate and fence).
absorption adjustment factor (AAF)	factor which adjusts the dose estimate in consideration of the absorption efficiencies of the study which is the basis of the toxicity information and the absorption efficiency of the route of exposure of concern. It is not itself an absorption efficiency.
accessible contamination	soil contamination generally located less than four (4) feet below the surface where the surface is not completely covered by an impervious (e.g., pavement) or permanent structure. For buildings having earthen floors, the floor shall be considered accessible. Note: Site specific conditions may influence contamination accessibility determinations.
active remedy/active remediation	engineered remedy that requires energy to be spent; for example, pump and treat, soil vapor extraction, air sparging, excavation.
acute exposure	one dose or multiple doses occurring within a short period of time (typically 24 hours or less)
ADC	average daily concentration (mg/m ³ or mg/m ³) during the exposure period.
ADD	average daily dose (mg/kg-day) during the exposure period.
ADE	average daily exposure (mg/kg-day) during the exposure period.
additivity	see <i>mixture evaluation</i> .
adherence factor (AF)	fraction of soil adhered to the skin.
adsorption	intrinsic potential of a molecule to bind to either the organic or mineral fraction of soil. One of the dominant factors in predicting the rate of contaminant migration through the subsurface.
advective transport	contaminant migration that occurs due to the motion of flowing ground water.
affidavit	see <i>real property notification/affidavit, restrictive covenant</i> .

agricultural property use	use of property for farming. Specific uses could include: cultivation of soil; growing and harvesting of any agricultural, horticultural, or floricultural commodity; dairying; raising of livestock, bees, fish, fur-bearing animals, or poultry; and turf and tree farming. Agricultural land use does not include property used for commercial storage, processing, distribution, marketing, or shipping operations.
air diffusivity	constant used to describe diffusion of a chemical in air.
air stripping	treatment system that removes volatile organic compounds (VOCs) from contaminated ground water or surface water by forcing an airstream through the water and causing the compounds to volatilize.
air-filled porosity	fraction of soil porosity filled by air.
air-filled soil porosity (θ_a)	a ration describing the volume of soil pore space filled with air to that of the total soil volume (L_{air}/L_{soil}).
area-weighted average	result of applying data collected at specific point locations to an area under investigation. The value at a given data point is assumed to be representative of an area. The area of influence of a data point extends from that point to halfway between that point and adjacent points.
aquifer	water-bearing rock or sediment that will yield water in a usable quantity to a well or spring.
ASTM RBCA	American Society for Testing and Materials Risk-Based Corrective Action. A standard guidance document used in underground storage tank investigations that utilizes a <i>tier evaluation</i> process to assess risk. ASTM ES-38, <u>Guide to Risk-Based Corrective Action at Petroleum Sites</u> .
background	environmental contaminant conditions representative of an area which has not been impacted by contamination from the site, and which represent natural, ambient conditions.
balancing criteria	once <i>threshold criteria</i> are met, a remedial option is chosen through consideration of balancing criteria: long-term effectiveness, implementability, short term risk; cost-effectiveness, and community acceptance. The <i>threshold criteria</i> of the National Contingency Plan (NCP) in addition to the above items, specifically included reduction in toxicity, mobility, or volume through treatment, which are now covered under long-term effectiveness.
bioavailability	degree to which a material in environmental media is metabolized by an organism.
bioconcentration	process by which there is a net accumulation of a chemical directly from an exposure medium into an organism.

biodegradation	biological degradation, or transformation of a chemical through biological processes. Depending upon the contaminant and the environment, biological degradation may reduce the contaminant completely to carbon dioxide, water, and salts (mineralization), or may result in the formation of numerous metabolites or “daughter products”, some of which are themselves contaminants.
biodegradation rate	rate at which a compound is biologically transformed into metabolites, usually expressed in terms of a biodegradation rate constant. Thus, a biodegradation rate constant of 0.1-1 yr indicates that one-tenth of the initial mass of the contaminant originally present will have biologically degraded over a one year period.
BTEX	abbreviation for the monoaromatic compounds benzene, toluene, ethylbenzene, and xylene.
bulk density	ratio of the dried mass of the soil/sediment sample to its field volume.
capacity	measure of an aquifer’s ability to transmit ground water to a well.
carcinogen	agent capable of inducing a cancer response
cation exchange	process through which the adsorbed cation constituents on colloidal sized particles are interchanged with other cations from the aqueous phase.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act; 42 U.S.C. §§ 9601 <i>et seq.</i> , the federal Superfund law.
chlorinated aliphatic hydrocarbons	non-aromatic chlorinated compounds including tetrachloroethene, trichloroethene, dichloroethene, trichloroethane, and vinyl chloride.
chronic exposure	multiple exposures occurring over an extended period of time or a significant fraction of an individual’s lifetime.
cis-DCE	cis isomer of dichloroethene that may be produced through the enzymatic biological degradation of trichloroethene.
clean zone	informal term for the interval between the lower boundary of a zone of contamination and the water table or the first saturated zone. Also referred to as “Zone 2” in the soil leaching guidance.
cleanup goal	level of control or conditions of contamination or environmental impact at a site such that the impact does not/will not, pose an unacceptable risk to human health, public welfare, or the environment, during any foreseeable period of time. A cleanup goal is developed from decisions made to ensure <i>cleanup levels</i> are met for specific media or to eliminate completed exposure pathways. <i>Cleanup goals</i> , <i>cleanup level</i> and <i>risk target levels</i> are related terms.
cleanup level	media concentration of a contaminant derived, when possible, from a risk-based <i>criteria</i> indicated by a tier evaluation or required by statute. This level is used as a partial measure of successful implementation of the <i>cleanup goal</i> provided in a response action plan or record of decision. The terms <i>cleanup level</i> , <i>criteria</i> , and <i>standard</i> are related but not synonymous. See also: <i>cleanup goal</i> , <i>target risk level</i> .

CLP	EPA Contract Laboratory Program. Laboratories that are under contract with EPA to perform specific analyses, using specific methods, with specific QA/QC procedures.
commercial property use	property use which is characterized by extremely varied and broad commercial use, encompassing everything from day care centers and schools to gas stations and warehouses. The physical setting of commercial properties and the activities which workers and the general public engage in at these sites are also extremely variable. This land use designation has been divided into unrestricted and restricted subcategories based on exposure potential.
complexation	process of metal species reacting with other dissolved chemical to form new chemicals.
compliance point	specific monitoring points (usually monitoring wells) at which the remedial standards are to be applied.
confinement	physical containment of the contamination that prevents, minimizes or controls the release and the associated potential for exposure. Considered an acceptable action when implemented as part of a remedy.
conservative tracer	chemical employed in the study of ground water movement that is recalcitrant to biological degradation and chemical transformation.
containment	1) remedy that reduces exposure by controlling ground water flow . Typically selected when other options not feasible, and is usually regarded as a long term activity. 2) confinement.
contaminant	see <i>pollutant</i> .
contaminant of potential concern (COPC)	material detected at a hazardous waste site which has the potential to adversely affect receptors due to its concentration, distribution, and/or mode of toxicity. Alternatively, referred to as chemical of potential concern.
contaminant redistribution factor (CRF)	a dimensionless factor that may be used to estimate contaminant attenuation due to storage and/or loss of chemicals from a contaminated soil layer (Zone 1 of thickness d_1) to an underlying, presently nonimpacted layer (Zone 2 with thickness d_2) in the Tier 2 SLV equation. It is calculated by use of the following equation: $CRF = \frac{d_1 + d_2}{d_1}$
criteria	a numerical value on which a judgement or decision can be based. In certain instances the term criteria is defined more narrowly to distinguish a value from promulgated standards (e.g., surface water criteria vs. surface water standards).
cross media transfer	transfer of contaminant mass from one medium to another (e.g., surface water or air) as a result of remedial activity.

cumulative receptor cancer risk	sum of the estimated excess lifetime cancer risks resulting from exposure to all contaminants at or from a site, at all exposure points, for a given receptor.
cumulative receptor non-cancer risk	calculation of the possibility of non-cancer health effects associated with exposure to all contaminants at or from a site at all exposure points identified for a given receptor. The HI is a measure of the Cumulative Receptor Non-cancer Risk.
data quality objectives (DQO)	a set of qualitative, and sometimes quantitative, statements which specify the quality of data required for supporting decisions at a site. DQO's are determined an iterative process that takes many factors into account.
daughter product	compounds such as pesticides or chlorinated aliphatic compounds frequently are biologically degraded incompletely, yielding other compounds that may be more or less toxic than the initial ("parent") chemical, <i>metabolite</i> . For example, the biodegradation of trichloroethylene (the parent compound) yields the daughter compound cis-dichloroethylene. See <i>biodegradation</i> .
deed notification	see <i>real property notification/affidavit</i>
depth of mixing (dm)	vertical extent of the aquifer from which in-situ ground water is assumed to be well mixed with leachate from the unsaturated zone under typical hydrologic conditions.
depth-weighted average concentration (DWC)	A vertical average of soil contamination that may given certain conditions be applied as an average concentration that may be compared to Tier 2 or Tier 3 SLVs.
diffusion	net flux of solutes from a zone of higher concentration to a zone of lower concentration.
dilution attenuation factor (DAF)	term that is used to predict the degree of mixing of the contaminant that is present in the soil leachate over a given distance in the ground water. It is defined as <div style="text-align: center; margin: 10px 0;"> $DAF = 1 + (Kd_m) / IL$ </div> <p>where K is the hydraulic conductivity of the aquifer, i is the hydraulic gradient, d_m is the depth of mixing of contaminant in ground water, I is the rate of infiltration of water through the soil to ground water, and L is the length of the area over which mixing is being calculated.</p>
direct-push equipment	generic term for drilling equipment used to advance a sampling device, such as a split-spoon, with little or no rotary movement. This equipment facilitates the collection of both soil and ground water samples during the same event. A retractable well screen or temporary well casing and screen can be used to collect water samples. Also called "push-probe".
dispersion, hydrodynamic	extent to which a substance introduced into a ground-water flow system spreads as it moves, due to mechanical mixing and molecular diffusion. Results in reduced contaminant concentrations down-gradient.
dispersion	spreading of solutes due to aquifer heterogeneities at pore-grain scale (mechanical dispersion) or at field scale (macroscopic dispersion).

dispersivity	term that describes the mechanical mixing of a contaminant in ground water.
distribution coefficient (K_d)	see <i>soil-water partition coefficient</i> .
DNAPL	see <i>NAPL</i> .
dose-response relationship	relationship between the amount of an agent (either administered or absorbed) and changes in certain aspects of the biological system (usually toxic effects), apparently in response to that agent.
drinking water aquifer	aquifer pumped within the review area to supply drinking water.
easement	an agreement giving the right to enter and/or use a property or a portion of a property owned by another, which is binding on current and future owners. An easement may include the right to locate, maintain, and operate remedial equipment or structures on the property. An easement is generally obtained by agreement of the property owner and may require consent of other parties with an interest in the property. The MPCA is authorized to acquire an interest in real property, including easements, by Minn. Stat. § 115B.17, subd. 15; and to enter into agreements granting MPCA interests in property related to partial response action plans under Minn. Stat. § 115B.175, subd. 2. An easement may also be acquired from an unwilling owner by MPCA through use of eminent domain authority (condemnation). Also <i>institutional controls</i> .
effective porosity	volume of the void spaces through which water and other fluids can travel divided by the total volume.
Eh	measurement of oxidation/reduction status of a system. See <i>oxidation/reduction potential</i> . Eh measurements are obtained through the use of platinum electrodes designed for this purpose.
electron acceptor	relative to natural attenuation, the compound that is used by a microorganism essential for growth and metabolic activity. Aerobic microbes, for example, use oxygen as an electron acceptor, producing water as a result of their metabolism. Other microbes use sulfate, iron III, manganese, or carbon dioxide as electron acceptors. PCE or TCE can serve as an electron acceptor for some microbes.
engineering controls	physical actions, structures or improvements (e.g., caps, vaults, fences, ground water gradient, methane gas capture/venting systems) that reduce, control, or interrupt exposure and/or migration of contamination.

environmental restrictive covenant	type of restrictive covenant that is filed with the property records by the county recorder or registrar of titles in the county where the property is located. The document describes the restriction(s) or condition(s) placed on the use of property, binding on current and future owners; acquired from the property owner as a condition for MPCA action (e.g., remedy approval, site delisting, etc.). It may require consent of other parties with an interest in the property. The MPCA is authorized to acquire interest in real property by Minn. Stat. § 115B.17, subd. 15; and by Minn. Stat. § 115B.175, subd. 2 for partial response action plan agreements. An <i>institutional control</i> .
equilibrium partitioning equation	an equation that describes the predicted concentrations of chemicals between different phases (i.e. water, pure liquid, and gas). The Tier 1 and Tier 2 SLCs are based upon a linear partitioning equation between the absorbed contaminant concentration (Cs) and the dissolved concentration in water (Cw), $Cs/Cw = Kd$, where Kd is the soil-water partitioning coefficient.
evapotranspiration	process by which water passes from the liquid to the vapor state under given climatic and soil-moisture conditions.
excess lifetime cancer risk (ECR)	product of exposure and carcinogenic potency. The resulting risk estimate is an upper-bound probability that an individual's exposure during a lifetime to a contaminant could result in cancer.
exposure pathway	course a contaminant takes from source to receptor. If the exposure point differs from the source, transport/exposure media (i.e., air, water) are also included.
exposure point	location of potential contact between a human or environmental receptor and a release of contaminants. An <i>exposure point</i> may describe an area or zone of potential exposure, as well as a single discrete point.
exposure point concentration	concentration of contaminants in a specific medium which a human or environmental receptor may contact at an exposure point.
exposure route	mechanism by which a contaminant comes into contact with a receptor, including, but not limited to, ingestion, inhalation, dermal absorption, and transpiration.
facility	facility as defined in Minn. Stat. § 115B.02, subd. 5, and includes any site or area where a hazardous substance, or a pollutant or contaminant, has been deposited, stored, disposed of, or placed, or otherwise came to be located.
false negative	conclusion that an event is false when in fact it is true.
false positive	conclusion that an event is true when in fact it is false.
feasibility study (FS)	analysis of the practicability of a proposal; e.g., a description and analysis of potential cleanup alternatives for a site such as one on the National Priorities List. The feasibility study usually recommends selection of a cost effective alternative. It usually starts as soon as the remedial investigation is underway; together, they are commonly referred to as the "RI/FS"

first order decay	the natural log of the reduction in contaminant concentration plotted against time, which yields a straight line. This behavior is typically dominant over zero- or second-order decay rates.
focused feasibility study (FFS)	small-scale investigation of a problem to ascertain whether a proposed research approach is likely to provide useful data.
fraction of organic carbon (f_{oc})	fraction of organic carbon to the total weight of the soil sample, expressed as a decimal. See <i>soil-organic carbon partition coefficient (K_{oc})</i> , <i>total organic carbon</i> ..
Freundlich relationship	empirical equation that describes the amount of chemical adsorbed onto a soil surface.
Global Positioning System (GPS)	system of multiple satellites that may be used to locate position of a GPS transmitter.
ground water	ground water consists of all waters below the surface of the earth, including, but not limited to, aquifers.
half life	time required for the concentration of a given chemical to become half its initial concentration through either biotic or abiotic processes.
hazard index (HI)	calculation of the possibility of non-cancer health effects as the result of exposure to contaminants. The calculation consists of summing the hazard quotients (HQs) for multiple substances with the same or similar toxic endpoints. See also: <i>target risk level</i> . The $HI = HQ_1 + HQ_2 + \dots + HQ_n$
hazard quotient (HQ)	ratio of a single substance exposure level (actual dose) to a reference dose for that substance derived from a similar exposure period (e.g., D_1/RfD_1 , where D is the daily intake/dose (or air concentration) for a particular contaminant, and the RfD is the reference dose (or air reference concentration, RfC)). See also: <i>target risk level</i> .
hazardous substance	any hazardous substance as defined in Minn. Stat. § 115B.02, subd. 8, which includes but is not limited to hazardous waste.
hazardous waste	hazardous waste as defined in Minn. Stat. § 115B.02, subd. 9 and Minn. Rules ch. 7045.
health advisories (HAs)	describe concentrations of drinking water contaminants at which adverse non-carcinogenic health effects would not be expected to occur over a specific exposure duration. HAs are developed for 1-day, 10-day, longer term (generally up to 2 years), and lifetime exposures based only on data describing non-carcinogenic endpoints of toxicity. For those substances which are known or probable human carcinogens, HAs for lifetime exposure are not derived. The documentation for each HA should be consulted before proceeding with any calculations. Documentation for HAs is available through the Education Research Information Clearinghouse (ERIC), (614) 292-6717.

Health Risk Limits (HRL's)	concentrations of a ground water contaminant developed by the Minnesota Department of Health (MDH) as directed by the 1989 Minnesota Groundwater Protection Act. A HRL is a concentration of a single contaminant, or a mixture of contaminants, that can be safely consumed daily in drinking water for a lifetime. HRLs are expressed as a concentration (ug/L) or calculated as a "hazard index" when multiple contaminants are present. HRLs only incorporate factors related to the protection of human health. Economic and technological factors, the protection of the environment, and the health of non-human species are not addressed. The MDH utilizes the HRLs for several public health purposes: 1) advice on private drinking water wells; 2) in instances where public water supplies contain contaminants for which there are no Maximum Contaminant Levels (MCL's); and 3) as criteria in the course of reviewing environmental projects.
Health Based Values (HBV's)	are developed by the MDH for substances or chemicals that have been detected in ground water and have adequate toxicological data but were not included in the HRL rule. HBVs are developed by the same methodology and have the same meaning as HRLs; however, HBVs are not promulgated under rule and have not undergone external peer review. A HBV is a concentration of a contaminant, or mixture of contaminants, that can be safely consumed daily in drinking water for a lifetime. A HBV is expressed as a concentration (ug/L) or calculated as a "hazard index" when multiple contaminants are present. HBVs are developed by the MDH upon request on a site-specific basis.
HEAST	U.S. EPA's Health Effects Assessment Summary Tables.
Henry's law constant (H)	coefficient that represents the equilibrium partitioning factor between water and vapor phase. Typical units for H are meters ³ -atm/ mole; the dimensionless equivalent value, H', is approximately equal to H*41.
hot spot	discrete area of a hazardous waste site characterized by contaminant levels substantially higher than those of the surrounding area of the site.
hydraulic conductivity (K)	coefficient that describes the capacity of a permeable medium to transmit fluid.
hydraulic gradient (i)	the change in head per unit distance along the direction of steepest change.
hydrolysis	abiotic or biotic breakdown of chemicals under the influence of H ⁺ and OH ⁻ ions in water.
in-situ remedies	remedies that are implemented at the site without removal of the contaminated media. For example, bioremediation technologies which inject oxygen and/or bacteria into the contaminated media.

industrial property use	use of property for industrial purposes. MPCA may consider property use to be considered “industrial” for risk characterization where property use will not allow public access to areas where residual contamination may be present in soil. In risk evaluation scenarios, potential occupational exposure assumptions are used in the calculation of cleanup levels. Industrial property uses generally include, but are not limited to, the following: public utility services, rail and freight services, raw storage facilities, refined material storage facilities, and manufacturing facilities engaged in the mechanical or chemical transformation of materials or substances into new products.
infiltration rate	term that describes the flow rate by which water migrates downward from the soil surface into and through the unsaturated zone.
infiltration scaling factor (ISF)	an adjustment factor that is used to estimate the average annual soil infiltration rate for a particular site in Minnesota. It is based upon a comparison of the published range in average annual precipitation rates in Minnesota with that of precipitation and infiltration rates calculated using SESOIL for three soil types.
institutional controls	as defined in Minn. Stat. § 115B.02, subd. 9a. Legally enforceable restrictions, conditions, or controls on the use of real property, ground water, or surface water located at or adjacent to a facility where response actions are taken that are reasonably required to assure that the response actions are protective of public health or welfare or the environment; includes <i>real property notification/affidavit</i> . Examples include zoning restrictions and well advisories.
interim response action (IRA)	early remedial actions taken to control immediate hazard during completion of the remedial investigation, alternatives analysis, detailed analysis, and remedial design.
intrinsic biodegradation	natural biological degradation of a chemical in situ.
ionizable organic compounds	organic chemicals with functional groups that can dissociate under subsurface pH conditions. For example, R-COOH compounds yielding R-COO ⁻ +H ⁺
IRIS	US EPA’s Integrated Risk Information System. One of the primary risk characterization databases.
irreducible water content	water content at which capillary pressure increases rapidly with negligible decrease in water content of porous medium.
J	analytical laboratory report qualifier indicating the identity of a chemical is certain, but the concentration is only an estimate. This data is to be used in the same way as positive data, but the uncertainty should be noted so that appropriate precautionary notes accompany the chemical evaluation.
K	<i>hydraulic conductivity</i> .
K_d	<i>soil-water partition coefficient</i> . Also: distribution coefficient, partition coefficient.
K_{oc}	<i>soil-organic carbon partition coefficient</i> .

K_{ow}	<i>octanol-water partition coefficient.</i>
LADC	lifetime average daily concentration (mg/m ³ or mg/m ³).
LADD	average daily dose (mg/kg-day).
leachate	liquid containing dissolved chemicals that is created by water passing through a contaminated soil or waste.
LNAPL	see <i>NAPL</i> .
lowest observed adverse effect level (LOAEL)	lowest exposure level at which there are statistically or biologically significant increases in frequency or severity of adverse effects between the exposed population and its appropriate control group.
lowest observed effect concentration (LOEC)	lowest concentration of a chemical in a toxicity test that causes an effect that is statistically significantly different from the controls.
matrix spike (MS)	1) spiked samples are samples that have specific concentrations of analytes of interest added. They are used to measure the performance of the complete analytical system including chemical matrix interference from a sample matrix. 2) an aliquot of sample spiked with a known concentration of target analyte(s). The spike occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix. (EPA SW 846, Rev.1, July 1992)
matrix spike duplicate (MSD)	intralaboratory split samples spiked with identical concentrations of target analyte(s). The spiking occurs prior to sample preparation and analysis. They are used to document the precision and bias of a method in a given sample matrix. (EPA SW 846, Rev.1, July 1992)
maximum contaminant level (MCL)	EPA administered maximum permissible level of a contaminant in water which is delivered to any user of a public water system. MCLs are enforceable standards that are set as close to MCLGs as feasible. MCLs consider factors such as treatment technology and cost and, therefore, are not strictly health based,. Thus, the basis for an MCL must be carefully examined before an MCL is used in a risk based decision, or, for example, to derive a reference dose. Generally, an MCL is not used to derive a reference dose.
maximum contaminant level goal (MCLG)	non-enforceable concentration of a drinking water contaminant that is protective against adverse human health effects and allows an extra margin of safety. MCLGs for substances considered to be carcinogenic are set at zero because EPA assumes that any level of exposure is associated with some level of risk. MCLGs for substances not treated as known or probable human carcinogens are based upon chronic toxicity or other health data and applied uncertainty data.
media	natural materials that may be contaminated by a release: soil, sediment, ground water, surface water, or air.
MERLA	Minnesota Environmental Response and Liability Act, Minn. Stat. §§ 115B.01-.24, the Minnesota state Superfund law.

metabolite	<i>daughter product.</i>
method detection limit (MDL)	minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, and is determined from the analysis of a sample in a given matrix type containing the analyte. (40 CFR Part 136 App. B)
microcosm study	laboratory studies designed to determine the rate of biodegradation or the fate of particular contaminants. Microcosm studies are carried out in laboratory flasks where variables such as pH, temperature, or oxygen can be carefully controlled. Normally, field samples of soil or ground water are used to set up replicate microcosm studies. Replicates may vary in contaminant concentration or incubating conditions in order to assess the effect of changing single parameters on the fate of a contaminant.
MINTEQ2	computer program for calculating geochemical equilibria. It was originally developed by Battelle Pacific Northwest Laboratory for the EPA. Its modeling capabilities include ion speciation, redox equilibrium, ion exchange, adsorption, and mass transfer. This model was used by USEPA to develop K _d values for metals as a function of soil pH.
mixture evaluation	when two or more contaminants have the same toxic endpoint, the cumulative risk must be determined. For non-carcinogens with the same toxic endpoint, a hazard index, i.e., a cumulative receptor non-cancer risk, must be determined. For carcinogens, a cumulative receptor cancer risk must be determined.
modifying factor (MF)	uncertainty factor which is greater than zero and less than or equal to ten; the magnitude of the MF depends upon the professional assessment of scientific uncertainties of the study and database not explicitly treated with the standard uncertainty factors (e.g., the completeness of the overall database and the number of species tested); the default value for the MF is 1.
NAPL	non-aqueous phase liquid. The free product, or non-dissolved, portion of the contaminants. A dense non-aqueous phase liquid (<i>DNAPL</i>) is denser than water and tends to sink through saturated porous media. A light, non-aqueous phase liquid (<i>LNAPL</i>) is less dense than water and tends to float at the water table.
natural attenuation	intrinsic capacity of soil and ground water to reduce concentrations of original contaminants, resulting in daughter products that may or may not be toxic. Natural attenuation processes are biodegradation, dilution, adsorption, and abiotic degradation.
natural resource damage assessment	study and compilation of damages to natural resources caused by site contamination. (43 CFR, Part 11)
net infiltration	the amount of infiltration from precipitation which reaches water table and is equivalent to ground water recharge. This is a required term in the dilution attenuation factor. The term infiltration rate and net infiltration and ground water recharge are equivalent as used in the soil leaching guidance.

no observed adverse effect level (NOAEL)	the exposure level at which there are not statistically or biologically significant increases in frequency or severity of adverse effects between the exposed population and its appropriate control group.
no observed effect concentration (NOEC)	highest concentration of a chemical in a toxicity test that causes effects that are not statistically significantly different from the controls.
non-point source	a land management or land use activity that contributes or may contribute to ground and surface water pollution as a result of runoff, seepage, or percolation and that is not defined as a point source under Minn. Stat. § 115.01, subd. 11.
octanol-water partition coefficient (K_{ow})	represents the degree to which an organic substance will preferentially dissolve in water vs. an organic solvent.
organic carbon content	see <i>fraction of organic carbon (F_{oc})</i>
outstanding resource value water (ORVW)	<u>class 2A surface water</u> - trout streams and lakes, protected as drinking water. <u>class 2B/2C/2D surface water</u> - warm and cool water streams, lakes and wetlands not protected as drinking water. <u>class 2Bd surface water</u> - warm and cool water streams and lakes, protected as drinking water
owner of real property	person, as defined by Minn. Stat. § 115B.02, subd. 11, and subject to the provisions set forth therein, who is in possession of, has the right of control, or controls the use of real property, including without limitation a person who may be a fee owner, lessee, renter, tenant, lessor, contract for deed vendee, licensor, licensee, or occupant.
oxidation/reduction potential	oxidation/reduction reaction is a chemical reaction where electrons are transferred from one chemical species (which is oxidized) to another (which is reduced). Formally defined, the oxidation/reduction potential is a measurement of the electromotive force generated in the coupling of two chemical half-reactions, normally expressed in volts. For purposes of this document, the oxidation/reduction potential is basically the measurement of how “electron rich” is the ground water or soil environment. Normally this is expressed numerically as pE or Eh. The fate of contaminants is closely linked to the redox status of the soil or ground water. For example, the large redox potential between an oxidized chlorinated solvent such as PCE and a methanogenic ground water environment favors the dechlorination of PCE to TCE, DCE and vinyl chloride.
P & T vial	purge and trap vial. Type of sample container used for the collection, storage and delivery of a water sample for VOC analysis. Most common example is 40 ml glass container with single teflon septum inside the screw cap.
passive remedy/passive remediation	remedy requiring no energy expenditure, other than monitoring. Synonymous with natural attenuation.

permanence	implemented remedy is considered permanent when it allows for the unrestricted use of all land and natural resources impacted by contaminants and, except for the purpose of treatment, does not involve removal of the contaminants to another site, and minimizes exchanges of the contaminant with other media.
permanent solution	measure or combination of measures which will, when completed, attain a level of each identified substance of concern at a disposal site or in the surrounding environment such that no substance of concern will present a significant risk to public health, safety, public welfare, or the environment.
permanent structure	a structure that is fixed in place and intended to last indefinitely. A multi-level concrete parking ramp is considered a permanent structure; as opposed to a slab-on-grade bituminous parking lot.
physical alteration	dredging, filling, draining, or permanent inundation of a wetlands. Restoring a degraded wetland by reestablishing its hydrology is not a physical alteration.
planned use of property	<p>current use of the property, if that use (or reuse) will be continued for a foreseeable period of time, or a new use involving activities that will continue for the foreseeable future. In most cases the term “planned use of the property” implies a long-term commitment or expectation about how the property will be used as determined by current or future owners or actions of local units of government, government agencies, or other organizations representing the community where the property is located, such as property use or economic development plans or zoning ordinances. A foreseeable period of time means the period of time during which requirements to maintain the necessary institutional controls, engineering controls as part of the remedy and/or other requirements such as compliance monitoring are necessary to protect public health and the environment. In some cases, the term planned future use may also encompass short-term development or redevelopment activities such as demolition, excavation, and construction.</p> <p>The concept of planned use generally refers to human use of the property, except where the use is specifically for ecological or environmental purposes, such as a nature preserve or a wildlife management area. Where habitat exists, exposures to ecological receptors are likely to be similar regardless of use (i.e., there is no residential or industrial exposure scenario for ecological receptors). Property use will influence ecological exposure primarily by affecting the presence or amount of habitat on a site. Therefore, ecological risk or protectiveness of remedies for the environment must be evaluated on a site-specific basis, independent of human property use scenarios.</p>
plume boundary	fringe of contaminated water in plan or cross sectional view. Determined by mapping contaminant concentrations.
point-of-use treatment	treatment of contaminated drinking water just upstream of human exposure. For example, point of use treatment of a residential drinking water well might consist of carbon treatment at the wellhead.

pollutant	pollutant or contaminant, as defined in Minn. Stat. § 115B.02, subd. 13, any element, substance, compound, mixture, or agent, other than a hazardous substance, which after release from a facility and upon exposure of, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in the organisms or their offspring. Pollutant does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel, or mixtures of such synthetic gas and natural gas.
porosity	ratio of the volume of void spaces in a soil to the total volume of the sample.
potential drinking water aquifer	(relative to a ground water risk evaluation review area) an aquifer that is not currently pumped to supply drinking water within the review area. This aquifer, outside the review area, could be used for drinking water.
potentially accessible contamination	contamination that is generally located at a depth of four to twelve (4 to 12) feet below the ground surface, or contamination located less than four (4) feet from the ground surface in an area completely covered by an impervious, nonpermanent structure (e.g., pavement). Whenever and wherever reasonable doubt exists over the characterization of accessibility, the more accessible category should be selected. Note: Site specific conditions may influence contamination accessibility determinations.
practical quantitation limit (PQL)	smallest concentration of an analyte for which quantitative results may be obtained with a specified degree of confidence. Considered the lowest level achievable among labs within specified limits during routine laboratory operations. Also called reporting limit (RL).
presumptive remedy	a remedy proven effective at previous sites with similar conditions. Used to streamline site characterization and accelerate the selection process.
property	real property, land, buildings and fixtures, and improvements attached to land and buildings and associated legal rights.
QA/QC	<i>quality assurance/quality control.</i>
quality assurance (QA)	system of activities whose purpose is to provide to the producer or user of a product or a service so that it meets defined standards of quality with a stated level of confidence.
quality control (QC)	overall system of activities whose purpose is to control the quality of a product or service so that it meets the needs of users. The aim is to provide quality that is satisfactory, adequate, dependable, and economic.

real property notification/affidavit	affidavit filed with the property records, maintained by the county recorder or registrar of titles in the county where the property is located, which constitutes notice to any party interested in the property that contamination, as described in the document, exists and states that if there are any questions concerning the contamination, interested parties should contact the MPCA for further details. In some cases, it is required by statute or rule; see Minn. Stat. § 115B.16, subd. 2 (property used as hazardous waste disposal site or site with extensive contamination); Minn. Rules pt. 7045.0496 (closed hazardous waste disposal units). This document is used only as a mechanism to notify interested parties (e.g., buyers, sellers, lending institutions, etc.) and does not require the owner of the property to take any actions with regards to the contamination. However, an owner with notice of contamination may become responsible for cleanup by conduct that associates the owner with or contributes to the release of contamination disclosed in the notice.
reasonable maximum exposure (RME)	maximum exposure that is reasonably expected to occur. An element of the <i>risk characterization</i> procedure.
receptor	1) human or non-human organism (or population, community, or ecosystem) that has or has the potential to experience adverse effects from direct or indirect exposure to contaminated media. 2) location of media point of exposure for a given receptor, as in “drinking water well” or “ground water receptor”.
recreational property use	use of property for recreational purposes which is characterized by unrestricted access by the public. In <i>site risk characterizations</i> , an exposure frequency lower than the residential setting and potential recreational exposure assumptions are used in the calculation of cleanup levels. Recreational property uses generally include, but are not limited to, the following: parks, playing fields, beaches, green spaces, open areas, wildlife management areas, and nature preserves.
reduced iron	Fe ²⁺ . Certain microorganisms generate Fe ²⁺ by using Fe ³⁺ as a terminal electron acceptor.
reduced manganese	Mn ²⁺ . Reduced manganese is produced by microorganisms that use Mn ⁴⁺ as an electron acceptor.
reducing conditions	ground water or sediments characterized by a low Eh reading or high hydrogen concentrations. In an environment that is strongly reducing (sulfate reducing or methanogenic conditions), microorganisms are able to donate electrons to the relatively oxidized chlorinated aliphatic compounds such as PCE, resulting in their dehalogenation.
reference concentration (RfC)	estimate (with uncertainty of perhaps an order of magnitude or greater) of a continuous inhalation exposure to a human population that is likely to be without an appreciable risk of deleterious noncancer effects.
reference dose (RfD)	estimate (with uncertainty of perhaps an order of magnitude or greater) of a daily inhalation exposure level for the human population, that is likely not to result in appreciable risk of deleterious effects during a lifetime. Chronic RfDs are specifically developed to be protective for long-term exposure to a compound.

relative permeability	in isotropic porous media, the ratio of effective permeability to the corresponding permeability at saturation.
release	release, as defined in Minn. Stat. § 115B.02, subd. 15, and subject to the exceptions set forth therein, and includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment which occurred at a point in time or which continues to occur.
remedial standard, level, requirement, or goal	risk or technology-based standard against which contaminant levels are compared to make a determination that 1) risk to public health and welfare and environment are reduced to an acceptable level, or 2) cleanup goals have been met. Similar or synonymous terms include cleanup levels, cleanup goals, thresholds, and threshold criteria.
remedy or remedial action	as defined in Minn. Stat. § 115B.02, subd. 16, and subject to the inclusions and exclusions set forth therein, and includes those actions consistent with permanent remedy taken instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance, or a pollutant or contaminant, into the environment. Conducted to prevent, minimize or eliminate the release in order to protect the public health or welfare or the environment. See <i>response action</i> .
remotely accessible contamination	1) soil contamination located at a depth greater than twelve (12) feet below the ground surface; or 2) soil contamination completely covered by an existing building or other permanent structure which does not have earthen floors, regardless of depth. Whenever and wherever reasonable doubt exists over the characterization of accessibility, the more accessible category shall be selected. Note: Site specific conditions may influence soil accessibility determinations.
remove or removal	as defined in Minn. Stat. § 115B.02, subd. 17. Generally includes short-term actions to remove or control a release in order to reduce risk to public health or environment of a hazardous substance, or pollutant or contaminant, from the environment.
residential property use	use of property as homes or residences. As used relative to <i>risk characterization</i> , this property use scenario generally assumes potential residential exposure in the calculation of cleanup levels. Residential property use can be characterized by single-family and/or multiple-family dwellings.
residual contamination	contamination remaining on-site after implementation of a remedial action has been completed.
response action	includes removal action and remedial action. (See Minn. Stat. § 115B.02, subd. 18).
responsible party	person(s) responsible for a release or threatened release of a hazardous substance, or a pollutant, or contaminant, as defined in Minn. Stat. § 115B.03. A responsible party who enters a site in the Voluntary Investigation and Cleanup (VIC) Program is also a voluntary party.

restricted commercial property use use of property for commercial purposes where access or occupancy by non-employees is less frequent or is restricted. This property use can range from no public access for both outdoor and indoor activities (e.g., large-scale warehouse operations), to limited public access and indoor office worker activities (e.g., banks, dentist office). In general, restricted commercial property use excludes the kinds of facilities specifically listed under unrestricted commercial use.

retardation/retardation coefficient term that refers to the effect that soil and sediments have on the movement of chemicals. For some chemicals, the solute front will travel more slowly than the rate of the advecting ground water, while others are more mobile. The mathematical expression for estimating the retardation of contaminants in ground water is:

$$R = 1 + [(K_{oc})(f_{oc})(\rho_b)]/n$$

where K_{oc} is the organic carbon partitioning coefficient, f_{oc} is the organic carbon fraction in the sediment, ρ_b is the soil bulk density.

review area relative to ground water pathways *risk evaluation*, the area surrounding the site within which aquifer type, present aquifer use, and future use are evaluated and classified as a measure of actual or potential human exposure.

risk assessment procedure a process to identify potential adverse effects to humans or ecosystems resulting from exposure to environmental hazards. May include qualitative and quantitative analyses. Elements of a risk assessment procedure include hazard identification (including chemicals of potential concern); toxicity (dose-response) assessment (the toxicity potential of the contaminant); exposure assessment (exposure routes, exposed populations, frequency, duration and extent of exposure); risk characterization (type and magnitude of risks to exposed populations using information from previous three elements); and the uncertainty analysis (nature and magnitude of uncertainty and variability inherent in, or assumptions and limitations of, the characterization of risks)

risk based corrective action (RBCA) tiered approach to remedial action supported by the American Society for Testing of Materials (ASTM). Remedial goals for sites with minimal data are conservatively low; as the amount of site specific investigative data increases, remedial goals can be tailored specifically for the site conditions, which in some cases requires less costly or involved cleanup actions.

risk characterization an element of conventional risk assessment procedure. A systematic, scientific assessment of potential adverse health effects resulting from exposure to hazardous agents or situations which uses information from the site characterization.

risk-based approach approach to decision-making in investigation and remedial action. Based primarily on evaluations of risks posed to human health and the environment. Other aspects considered in this approach include planned property use, a preference for detoxification and treatment, and minimization of cross-media transfer of contaminants.

risk-based site evaluation RBSE, a process of applying a tiered evaluation scheme based on site specific characteristics and property or surface water use. It extends beyond risk characterization to include statutory, engineering, economic, social and political factors in making site decisions.

risk management a decision-making process whereby policies or regulations related to political, social, historical, and economic factors are integrated with risk assessment.

RPD relative percent difference. A statistical quantity, derived from the following formula:

$$RPD = \frac{|A - B|}{\left(\frac{A + B}{2}\right)} * 100$$

where A and B are analytical results for duplicate samples.

saturation concentration maximum amount of nonaqueous liquid phase that porous medium can hold under given conditions.

Secondary Maximum Contaminant Level (SMCL's) non-enforceable guidelines regarding cosmetic effects (such as skin or tooth discoloration) and aesthetic effects (such as taste, odor, or color) of drinking water.

SESOIL acronym for "A Seasonal Soil Compartment Mode", developed for the EPA. It was designed for long-term environmental hydrologic, sediment, and pollutant fate simulations. In the hydrologic cycle rainfall, infiltration, surface runoff, evapotranspiration, and ground-water recharge are considered. In the pollutant fate cycle advection, diffusion, volatilization, adsorption and desorption, chemical degradation or decay, and other processes are taken into account. It can also model to a limited degree effects of biological degradation on the leaching process.

short-term hazard hazard which would pose a significant risk of harm to health or safety if it were present for even a short period of time.

site 1) physical property where a release has occurred or the source is located, as well as where remediation may be needed, 2) property or portion of property evaluated for potential environmental impact relative to technical assistance or liability assurance. See *facility* and *release*.

site characterization a systematic process involving documentation of a qualitative and quantitative site investigation, including data collection results, identification of exposure pathways, and forming conclusions and recommendations. The results of a site characterization and a tier evaluation inform each other as part of an iterative process which leads to remedial action decisions.

slope factor	slope of the cancer dose-response curve in the low-dose region. The units of the slope factor are usually expressed as 1/(mg/kg-day). The slope factor represents a plausible upper-bound estimate of the probability of an adverse health-related response per unit intake of a chemical over a lifetime.
soil bulk density	the ratio of the dried mass of the soil/sediment sample to its field volume.
soil-organic carbon partition coefficient (K_{oc})	K_{oc} predicts the degree to which a chemical will bind to the organic carbon fraction in the soil (L/kg). The K_{oc} may be thought of as soil-water partition coefficient normalized for organic carbon. For organic compounds, the K_d may be estimated by $K_d = K_{oc} * f_{oc}$. Also <i>distribution coefficient, partition coefficient</i> .
soil leachate concentration (SLC)	concentration of a contaminant in the soil leachate that represents the dissolved form of that contaminant in the aqueous phase. It is calculated based on the total contaminant concentration in the soil, the capacity of the contaminant to bind to the soil matrix, and the physico-chemical characteristics of the contaminant.
soil leaching value (SLV)	estimated concentration of a contaminant in soil that will not likely, through typical leaching processes, contaminate underlying ground water given certain physical conditions predominating at the site. Calculation of the SLV considers the capacity of the contaminant to bind to the soil matrix, as reflected in the soil leachate concentration (SLC), the dilution attenuation factor (DAF) in the ground water, and/or the potential for the contaminant to biologically degrade.
soil-water partition coefficient (K_d)	K_d is an experimentally derived physical constant that expresses the ratio of the amount of chemical adsorbed to the soil solids to the amount dissolved in the water (L/kg). K_d is a valid predictor of the partitioning between liquid and solids only if the reactions that cause the partitioning are assumed to be fast and reversible. The reversibility of partitioning equilibria is thought to decrease significantly with older spills.
soil saturation concentration (C_{sat})	concentration of a contaminant in soil at which the absorptive limits of the soil particles, the solubility limits of the soil pore water, and the saturation of soil pore air have been reached.
soil venting	treatment system that removes volatile organic compounds (VOC's) from contaminated soil by forcing air through the soil matrix, volatilizing compounds which are then vented and/or treated.
soil-to-groundwater leaching pathway	route for migration of contaminants from the soil matrix to the underlying ground water.
solubility	physical property of a compound, normally expressed in milligrams per liter, that determines how much of a solute (the contaminant) that the solvent (water) can carry in dissolved form per unit volume.
source area boundary	lateral and vertical extent of <i>source area</i> .
source length (L)	length of a contaminated source area along the direction of groundwater flow.

source area	area of soil or ground water from which contamination originates. May include waste material or contaminated soil or ground water, including a secondary contaminant plume.
specific capacity	expression of well productivity, the yield of a well per unit of drawdown.
SRV	average daily exposure (mg/kg-day) during the exposure period.
stable plume	stable ground-water contaminant plume occurs when there is no net advance of the plume front, and no significant change over time in contaminant concentrations measured in network and compliance wells or other compliance points. The rate of contamination advance is equal to that of natural attenuation, creating a stationary plume front.
standard	standards are regulatory media concentrations promulgated by local, state or federal government. In Minnesota they include ground water Health Risk Limits, and refer to Surface Water Standards, though not all are based on aquatic life. Maximum Contaminant Levels (MCL's) are a Federal standard.
storativity (S)	volume of water released from or taken into aquifer storage per unit surface area of aquifer per unit change in head. Storativity is equal to the product of the specific storage and the aquifer thickness. Also known as storage coefficient.
subchronic exposure	multiple exposures occurring over a small fraction of an individual's lifetime (e.g., a period of several months to several years)
surface waters	waters of the state excluding ground water as defined in Minn. Stat., section 115.01, subd.6.
surface water standards	standards applied by the MPCA Division of Water Quality for the protection of surface water bodies. See MN Rule 7050.
target risk level	values, such as <i>hazard quotient</i> and <i>hazard index</i> , that represent levels of acceptable risk protective of human health, public welfare and the environment. For example, the ratio 0.2, the <i>hazard quotient</i> for an individual compound associated with a non-cancer chronic endpoint, is a <i>target risk level</i> . The <i>Cleanup goal</i> and <i>cleanup level</i> are derived, in part, from the <i>target risk level</i> .
Tier evaluation	quantitative, phased approach to site risk assessment requiring increasing amounts of site specific data collection and analysis to evaluate risk and to determine the need for additional site investigation or remedial action.
Tier 1 evaluation	early site evaluation, sometimes considered a screening level evaluation. Tier 1 includes the initial quantitative risk evaluation and will determine if site conditions warrant further investigation. This evaluation requires the least amount of site specific information and consists of comparing site contaminant data to non-site specific Tier 1 criteria to determine if individual contaminants or mixtures of contaminants pose a potential risk exceeding <i>target risk levels</i> . Sites presenting conditions that are not addressed by the generic Tier 1 assumptions about exposure pathways must undergo a more site-specific evaluation.

Tier 2 evaluation	site evaluation which typically relies on a limited amount of site-specific information including land or surface water use determinations. The site contaminant concentrations are compared against Tier 2 criteria which are generated using more site-specific information to determine if individual contaminants or mixtures of contaminants pose a potential risk exceeding the target risk levels.
Tier 3 evaluation	site-specific evaluation based on more complex modeling using site-specific data. Tier 3 evaluation is necessary in cases where remediation to Tier 2 target risk levels is not feasible or when site conditions require a unique approach to site investigation and setting remediation goals.
TCLP	Toxicity Characteristic Leaching Procedure. A laboratory procedure for soil, sediment, or waste samples, that simulates conditions in a landfill by leaching the sample with an acidic solution. The leachate is then analyzed for specific inorganic and/or organic species. There are separate regulatory standards for TCLP analytes which define whether or not a sample is hazardous.
total organic carbon (TOC)	carbon fraction of the total organic matter of sediments or groundwater. It is the portion of the sample that comes from biologically derived compounds composed primarily of nitrogen, carbon, oxygen, and phosphorous. It may be estimated by multiplying the organic matter concentration by 0.6. See <i>fraction of organic carbon, (F_{oc})</i> .
total porosity	ratio of the volume of void spaces in a soil or sediment to the total volume of the sample.
toxic endpoint	endpoint of cancer for carcinogens or the organ or physiological system(s) affected by exposure to noncarcinogens.
toxicity threshold	dose or exposure below which a significant adverse effect is not expected. Carcinogens are thought to be non-threshold chemicals, to which no exposure can be presumed to be without some risk of adverse effect.
transmissivity (T)	rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient. Transmissivity is a function of the properties of the liquid and porous medium, and the thickness of the porous medium.
uncertainty factor (UF)	one of several, generally 10-fold factors, used in operationally deriving the Reference Dose (RfD) from experimental data. UFs are intended to account for: (1) variation in sensitivity among the members of the human population; (2) the uncertainty in extrapolating animal data to humans; (3) the uncertainty in extrapolating from data obtained in a study that is of less-than-lifetime exposure; and (4) the uncertainty in using LOAEL data rather than NOAEL data.
unit risk	upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 mg/L in water or 1 mg/m ³ in air.

unrestricted commercial property use	use of property for any commercial use including to house, educate, or provide care for children, the elderly, the infirm, or other sensitive subpopulations. Relative to risk evaluation, an unrestricted commercial use exposure scenario allows for a higher exposure potential which approximates a residential setting. This subcategory of commercial property use is usually, but not always, located in or near residential areas and, therefore, may be used by other populations for purposes other than the intended commercial use (e.g., recreational). Specific uses could include, but are not limited to: day care centers; any form of educational facility; churches; social centers; hospitals; elder care facilities; and nursing homes.
vadose (unsaturated) zone	as used in this document, the vadose zone is defined as the zone between the land surface and the water table. It includes the root zone, intermediate zone, and capillary fringe. The pore spaces contain water at less than atmospheric pressure, as well as air and other gases.
VIC Program	the Voluntary Investigation and Cleanup program of the MPCA
volatile organic compound (VOC)	generally, an organic compound with a Henry's Law constant greater than 10^{-5} (atm-m ³ /mol), a boiling point less than 180°C, and a molecular weight less than 200 g/mole .
volatility	physical property of any compound that indicates its tendency to change to a gas state. It is expressed as vapor pressure (mm Hg) for pure compounds. Henry's Law is used to determine volatility of dissolved compounds.
volatilization	conversion of all or part of a liquid or solid to a vapor or gas.
volumetric moisture content	volume of water divided by the total volume in a sample of aquifer.
volumetric water content	ratio of the volume of water contained in a given sample of soil/sediment to to the bulk volume of the entire field soil/sediment sample.
voluntary party (VP)	person who has entered into the MPCA Voluntary Investigation and Cleanup Program. A voluntary party may be either a responsible person or a non-responsible person.
water diffusivity	constant used to describe diffusion of a chemical in water.
well advisory	action by the Minnesota Department of Health to limit or prohibit consumption of water from a drinking water well or aquifer, due to contamination.
wellhead protection area	capture zone of a municipal well corresponding to a given travel time to the well (typically 5, 10 or 20 years). A rule administered by MDH requires a land use plan promoting best management practices within a wellhead protection area.

wetlands

areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Constructed wetlands designed for wastewater treatment are not waters of the state. Wetlands must have the following attributes: 1) a predominance of hydric soils; 2) inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in a saturated soil condition; and 3) under normal circumstances support a prevalence of such vegetation..

X-ray fluorescence (XRF)

1) the property of a sample, usually soil or sediment, that permits the analysis of inorganic (usually metal) species. 2) an XRF spectrophotometer is a portable instrument that can be used for running these types of analyses in the field. The instrument uses a radioactive source to bombard the sample with x-rays, and the resultant emissions (fluorescence) are analyzed to yield a concentration of the target analyte(s) in the sample.