Water Treatment
NOTES

Cornell Cooperative Extension, College of Human Ecology

Terminology for onsite sewage treatment systems

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This fact sheet briefly defines some of the terms associated with onsite sewage treatment. *Italicized* terms are defined in this list. Further information can be obtained from the references listed at the end of the fact sheet.

absorption area: an area to which *effluent* emerging from a *septic tank, aerobic unit, or sand filter* is distributed for *infiltration* into the soil; only certain soil types and geologic conditions are appropriate for absorption areas. Synonym: absorption bed, absorption field, leach field, drain field, soil absorption area

absorption area resting: removing an *absorption area* from active use for 6-12 months to increase aeration, allow bacteria to break down accumulated waste and allow *effluent* to drain; recommended for a *failing system* that has been overloaded with waste; an alternate absorption area is required. Synonym: drain field resting, leach field resting, absorption field resting

absorption bed: see *absorption area*

absorption chamber: perforated concrete or plastic chamber laid on top of raked native soil; *effluent* from *the septic tank* goes into the chamber, then seeps into the soil below; does not usually require *aggregate backfill*. Synonym: graveness absorption chamber, leaching chamber, infiltration chamber, infiltration galley, trigalley, galley, drainage chamber

absorption trench: see *trench*

access port: see *inspection port*

aerate: to supply with air; in *sewage* treatment, to mix air with sewage to promote biological *decomposition or* treatment of the sewage.

aerobic: living in the presence of oxygen; refers to *sew*age-degrading bacteria (usually in the soil) that must have oxygen to survive. Synonym: aerobe, oxic

aerobic unit: a *sewage* treatment device that mixes air with sewage (see *aerate)* to facilitate biological decomposition. Synonym: aerobic package plant, package plant

aggregate: washed gravel or stone with a diameter of approximately ¾ - 1 ½ inches used as an *effluent* storage and distribution medium in the *absorption area.*

air-assisted toilet: a water *conservation device* that uses air to transport waste to the *sewage* system; uses 0.5 gallons of water per flush as opposed to conventional toilets that use 1.6 - 5.0 gallons of water per flush.

anaerobic: not requiring oxygen to live; refers to certain species of *sewage-degrading microorganisms* in a *septic* tank. Synonym: anoxic

anoxic: see *anaerobic*

application rate: the rate at which the *effluent* from a *septic tank or aerobic unit* is applied to the *absorption area;* usually expressed in gallons/day/square foot (gpd/sq.ft.).

auger: a tool used to bore holes

available soil: see *usable soil*

B **backfill:** to replace the soil that was removed from an *absorption area* or around a *septic tank* or *other wastewater* treatment device. Synonym: fill

back flush: usually refers to removing contaminants from a water softener and sending the brine discharge (containing high concentrations of sodium, calcium, and magnesium) to the *sewage* treatment unit; in some areas this is not allowed if the sewage treatment unit is a traditional *septic system.* Synonym: backwash

baffle: a device installed in a *septic tank or distribution box* to slow the velocity of liquids and increase settling of solids; limits movement of solids to the *absorption area,* Synonym: deflector

bedrock. the rock that underlies soil; can limit movement of chemicals to *groundwater* if not fractured or weathered.

berm: a raised area of soil that diverts precipitation or runoff away from an *absorption area;* also, an earthen structure to support the sides of a sewage system that is above grade or on a slope.

biomat: see *organic mat*

black water: liquid waste from toilets (as opposed to *gray water,* the liquid waste from sinks, washing machine, water treatment devices, showers, tubs, etc.)

C **cesspool:** perforated concrete tank that receives household *sewage* directly and does not follow a *septic tank or aerobic unit;* not considered by most health departments to be appropriate for sewage treatment; often mistakenly confused with a *dry well or seepage pit.*

cistern: a collection system for precipitation that, if untreated, is not an appropriate drinking water source but can divert excess water from the *septic tank or absorption area,* although ditches and *curtain drains* are the best way to divert excess water.

cleanout: see *inspection port*

Clivus Multrum: a manufacturer of a *composting toilet.*

community system: a network of pipes from households in a given area that connect to a common *sewage* treatment plant. Synonym: cluster system

compacted soil- see *smeared soil*

composing toilet: toilet in which wastes are not mixed with water but collected and biologically *decomposed into* humus. Synonym: *Clivus Multrum,* waterless toilet

conservation device: any device that limits the amount of water used in a given activity, such as low-flow shower heads, water-saving toilets, water-saving faucets, composting toilets, toilet dams. Synonym: water conservation device, flow-restrictor

conveyance fines: the network of pipes connecting the various parts of a *sewage* treatment system.

curtain drain: a drain installed below the soil surface to limit the flow of *groundwater* into a *sewage* treatment system. Synonym: vertical drain, under drain

cut-and-fill system: an absorption trench system in an area where *impermeable* soil is found above *permeable* soil; impermeable layer is replaced with permeable soil.

D **decay-resistant**: see *inert solids*

decomposition: rotting; in *sewage* treatment, reduction of volume and type of wastes due to action of *microorganisms.* Synonym: digestion

deep hole test: an examination of the soil profile prior to installation of a *sewage* treatment system; evaluates the suitability of the soil for sewage treatment, determines depth to *bedrock,* depth to *water table,* and occurrence of *impermeable* soil. Synonym: soil cut inspection

digestion: see *decomposition*

distribution box: a concrete, fiberglass, or plastic box that is situated between the *septic tank and absorption area* to evenly distribute *effluent* by gravity flow from the *septic tank* to the *absorption area.* Synonym: distribution device, D-box

distribution line: see *perforated pipe*

dosing: using a pump or siphon to move effluent from the *septic tank* to the pipe network of an *absorption area;* movement through the pipe network is by gravity; dosing assists in even distribution of the *wastewater* into the absorption area; not the same as *pressure distribution,* which uses a pump to move effluent through the pipe network.

drainage chamber: see *absorption chamber*

drain field: see *absorption area*

dry well: an improper term for *seepage pit;* it has nothing to do with wells.

dual-chamber tank: see *multi-compartment tank*

dye test: a test to determine leaks/failure in the *onsite sewage treatment system;* a fluorescent dye, such as Rhodamine-B, is added to the toilet tank, and the sewage treatment system is examined for evidence of dye appearance. Synonym: fluorescent dye test, Rhodamine-B dye test

E

effluent: the liquid that is released to or from a *septic tank or aerobic unit;* raw effluent is that which has not been treated in any way; treated effluent is that which has gone through a septic tank, aerobic unit, or *absorption area.*

enzymes: in *sewage* treatment, a substance produced by living cells that is marketed as an additive for *septic tanks* to speed *decomposition* of solids; enzyme addition is usually not necessary in a septic tank due to the large number of *microorganisms* present in human waste that are able to decompose the solids in the tank.

evaporation-transpiration systems (El): movement of *effluent* upward through the soil and overlying vegetation and into the atmosphere, rather than downward movement into the soil; usually used when more traditional *sewage* treatment systems are not suitable; very specific design criteria must be met for system to be approved.

F

failed system: a *sewage* treatment system that no IF, longer effectively treats household waste; generally has a visible surface discharge, or may be indicated by plumbing system back ups.

flow restrictor: see *conservation device*

fluorescent dye test: see *dye test*

French drain: see *curtain drain*

G

gas-deflector: venting provisions in your *septic tank* that direct gases safely away.

gas-vent: vent for the accumulated gases that form in the *septic tank* during *decomposition*, mostly located on the roof of the house.

geotextile: *permeable* material used to cover ag*gregate in trenches* to prevent soil from mixing with the aggregate following *backfilling* operations but allowing air and moisture to move through the soil and aggregate; aggregate may also be covered with *untreated building paper* or clean hay.

gravel: filling material for trenches in which the distribution lines lie. It is used for eased discharge of waste water to the soil.

gravelless absorption system: see *absorption* chamber

gray water: *effluent* from household sinks, shower/bathtub, clothes washer, water treatment units, etc., that does not contain toilet waste.

grit: see *inert solids*

groundwater: subsurface water that originates as rain or snow melt; groundwater seeps through the soil profile until reaching a depth where all soil/rock pores are filled; the top of this saturated zone is called the *water table.*

H

holding tank: a watertight tank, similar to a *septic tank,* that collects waste and holds it until it can be pumped and transported to a *sewage* treatment system; used on small lots with no suitable *absorption area* or in a location too isolated for a *community system;* use is frequently restricted by health department regulations.

household hazardous waste: any of a number of products found in the kitchen, bathroom, garage, or garden shed that by their chemical nature can poison, corrode, explode, or burst into flame when handled improperly.

hydraulic load. the amount of *effluent* applied to the *absorption area;* can be decreased by using water con*servation devices;* hydraulic overloading occurs when the absorption area receives more effluent than it can effectively treat; this can result in *ponding*.

I

impermeable: see *permeable*

inert solids: the solid portion of household waste that cannot be *decomposed by microorganisms* such as sanitary napkins, grease and other solids. Synonyms: *grit*, and *decay resistant materials*

infiltration galleys: see *absorption* chamber

infiltration rate: the amount of time necessary for *effluent* to flow from the *absorption area* into the soil; varies with soil type and other environmental factors, and is usually expressed in gallons/day/square foot (gpd/sq. ft.) measured by a *percolation test* .

inlet pipe: the pipe conveying *wastewater* into a vessel *(septic tank, distribution box,* etc.).

inspection port: an access hole in the *septic tank* to allow inspection of the tank or its contents; tank should always be pumped through central access manhole. Synonym: manhole, access port, clean-out

L **leach field:** see *absorption area*

leaching chamber: see *absorption chamber*

leaching pit: see *seepage pit*

limiting layer.- *impermeable soil, bedrock,* or other physical impediment that limits the downward movement *of effluent* from the *absorption area.*

liquid layer.- *wastewater* in a *septic tank* that is between the overlying layer *(scum)* and the underlying layer *(sludge);* after exiting the septic tank, the liquid layer becomes *effluent* that flows to the *absorption area.*

M **manhole:** see *inspection port*

mastic: putty-like materials that are used to coat or cement various parts of a *septic system* to seal it or make it watertight.

microgram: any living creature, including bacteria, viruses, and protozoa's, of microscopic or submicroscopic size.

mound. a type of soil *absorption area* that is raised above the natural soil surface using an appropriate fill material; smaller than a *raised bed* system; used when the depth of *permeable* soil is less than the required 4 feet or in areas of high water table.

multi-compartment: a *septic tank* with more than one chamber to increase removal/separation of solids *(primary treatment).* Synonym: dual-chamber tank

N **National Sanitation Foundation (NSF):** a nonprofit organization that certifies the construction of components and materials in *wastewater treatment* systems.

O **onsite sewage treatment:** a general term refer ring to any of the various systems for treating waste emanating from a household plumbing fixture or water treatment unit.

organic mat: the *microorganisms and organic matter* that build up around a *soil absorption area* at the media soil interface; can be especially prevalent with *sand filters.*

organic matter: any material derived from living things.

outhouse: a small, shed-like structure, away from the main dwelling that houses a toilet. Synonym: privy.

outlet pipe: the pipe conveying wastewater out of a vessel (septic tank, distribution box, etc.).

overflow pipe: a flow-relief pipe to convey excess *wastewater* from a vessel (drop *manhole, dosing* siphon, etc.).

P **package plant:** see *aerobic unit*

pathogen: any *microorganism* that is hazardous to human health.

percolation or **perc test:** a method of determining the suitability of the soil for an *absorption area;* a test hole is dug, water added to the hole, and the rate of *infiltration* of water into the soil is determined.

percolation rate: see infiltration rate

perforated pipe/tile: the pipe in an *absorption area* that contains regularly spaced holes to release *effluent* into the media such as sand or *aggregate* and then into the soil.

permeable: allowing liquid to pass through; used when describing soil absorption systems and their suitability for *sewage* treatment. Antonym: impermeable.

ponding: if the *hydraulic load* is too high for the *drain field,* the water can come up to the surface and form small ponds of untreated wastewater.

pressure distribution: using d pump to distribute *septic tank or aerobic unit effluent* through the pipe network of *a soil absorption area* resulting in a more even distribution of effluent over the soil than does gravity distribution.

primary treatment: the treatment of household *sewage* that takes place in a *septic tank;* separates floating and settleable solids from raw wastewater.

R **raised system:** an *absorption trench* system constructed in appropriate fill material placed above the natural soil surface; larger than a mound system.

remediation: methods to correct problems that caused a failing *septic system*

Rhodamine-B dye test: see *dye test*

sand filter: a *sewage* treatment system, the *septic tank or aerobic unit effluent* is distributed through a bed of sand (either at ground level or buried); pipes beneath the sand filter collect the treated effluent, which may then be discharged to an *absorption mound*.

S

sanitary tee: see *baffle*

saturated soil- soil that has all spaces between soil particles filled with liquid.

scum: the *wastewater* in a *septic tank* that is less dense than the *liquid layer* and floats on top of the liquid layer. Synonym: scum cake.

seasonal high water table: the top of the *saturated soil* layer at critical times of the year; *groundwater that* occasionally rises above its normal level in the soil and can interfere with the *onsite sewage treatment system.*

secondary treatment: soil processes that treat *effluent* from a *septic tank; primary treatment* occurs in the septic tank.

seepage pit: a covered pit with a perforated lining that accepts *effluent* from a *septic tank* and allows it to *infiltrate* the surrounding soil; may replace the soil *absorption area* and often incorrectly called a *cesspool.* Synonym: leaching pit.

septage: the contents *(sludge, liquid layer, and scum)* extracted from a *septic tank.*

septic tank: a watertight concrete, fiberglass, polyethylene, or steel tank that is buried in the ground and accepts *sewage* from a household.

septic tank additives: any of a number of products that are marketed to *decompose* waste in a *septic tank;* most are not necessary and some are actually harmful to the *microorganism* population in the tank. See *enzymes*

septic tank pumping: the process by which the contents of the *septic tank (septage)* are removed and hauled to a *sewage* treatment plant for further treatment or to a land-spreading operation.

sewage: the human and household waste discharged through the home plumbing system. Synonym: wastewater

sewage treatment plant: a facility that treats *sewage* from a community; usually primary *and secondary* treatment are included. Synonym: wastewater treatment plant

sewer district: a political and geographic designation of homes/businesses/community that share a common *sewage* disposal system.

siting: finding a good place for your *septic system* on your property while adhering to the local laws about distances and the results of your *perc test*.

sludge: the accumulated solids that settle to the bottom of a *septic tank.* Synonym: solids layer.

smeared soil: soil that has been compacted in the process of installing an *absorption area; infiltration of effluent* is restricted in smeared soil. Synonym: compacted soil

snake: a tool used to clear clogged *sewage lines.*

soil absorption area: see *absorption area*

soil cut inspection: see *deep bole test*

soil pores: the spaces between soil particles**.**

solids layer: see *sludge*

subsurface disposal system: any *sewage* treatment system that is buried beneath the soil surface.

suspended solids: solid material that is suspended in the *liquid layer.*

T

trench: an excavated area of soil in the *absorption T area* into which *aggregate and* perforated *pipe are* laid for the purpose of distributing *septic tank or aerobic unit effluent.* Synonym: absorption trench

U

under drain: see *curtain drain*

untreated building paper: a *permeable* material often used to cover *aggregate in trenches* to prevent soil mixing with aggregate following *backfilling* operations while allowing air and moisture to move through soil and aggregate; aggregate may also be covered with *geotextile* or clean hay.

usable soil. the depth of soil available in an *absorption area* that is suitable for *secondary treatment.* Synonym: available soil

V

vent: an outlet for gases from the *sewage* treatment system.

vertical drain: see *curtain drain*

W wastewater: see *sewage*

wastewater treatment plant: see *sewage* treatment plant

water table: the top of the area in soil where all soil/rock pores are filled with liquid.

References

Starred (*) references are especially helpful for further information.

*Canter, L.W., and R.C. Knox. Septic Tank System Effects on Ground Water Quality. Chelsea, MI: Lewis Publ. 1986.

Guidelines for Septage Handling and Disposal. New England Interstate Water Pollution Control Commission. TGM-1. August 1976.

*It's Your Choice: A Guidebook for Local Officials on Small Community Wastewater Management Options. EPA 430/9-87-006. September 1987.

*Lomax, K.M. Home Septic Systems: Proper Care & Management. Univ. of Delaware Coop. Ext. Svc. Ext. Bull. 126.

*Lukin, John. Understanding Septic Systems. Northeast Rural Community Assistance Program. July 1988.

*Makuch, J.R., W.E. Sharpe, and A.R. Jarred. Two Remedies for Failing Septic Systems. Pennsylvania State Univ. Coop. Ext. Circ. 302.

*Onsite Domestic Sewage Disposal Handbook. Midwest Planning Service. August 1982.

Septic Systems - How They Work and How to Keep Them Working in Vermont. Agency of Environ. Cons., State of Vermont. 1978.

Wastewater Treatment Standards - Individual Household Systems. N.Y.S. Dept. of Health. Appendix 75A. 1990.

*Maintaining Your Septic System – A guide for Homeowners, Pipeline. Vol.15 No. 4 FALL 2004 a NESC publication, available at: http://www.nesc.wvu.edu/nsfc/pdf/pipline/PL_fall04.pdf

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