

Handbook for the Collection, Transportation, Disposal and Land Application of Residential Septage in Pennsylvania



Introduction

Approximately 605 million gallons of residential septage (septage) are generated by Pennsylvanians each year. Homes and businesses located in rural areas where no public or community wastewater collection and treatment systems are present must either treat their wastewater using an onlot sewage treatment system or by containing the wastewater in a holding tank.

Septage must be handled, processed and disposed of properly in order to protect public health and the environment.

The processing and disposal of residential septage is a growing issue in Pennsylvania. There are two options for the processing and disposal of septage.

The first option is to transport the septage to a municipal or private wastewater treatment facility or a septage treatment facility where it can be properly treated prior to final disposal. This option is not always feasible due to the location of facilities that will accept septage for treatment.

The second option is to beneficially use the septage by land application at an agricultural or reclamation site.

Defining Residential Septage



The Department of Environmental Protection (DEP) defines **residential septage** as liquid or solid material removed from a septic tank, cesspool or similar

treatment works that receives only waste or wastewater from humans or household operations. The term includes processed residential septage from a residential septage treatment facility. The term does *not* include liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

To further clarify this definition, a **commercial establishment** is defined as an establishment engaged in a nonmanufacturing or nonprocessing business, including, but not limited to, stores, markets, office buildings, restaurants, shopping centers and theaters and an **industrial establishment** is defined as an establishment engaged in manufacturing or processing, including, but not limited to, factories, foundries, mills, processing plants, refineries, mines and slaughterhouses. Therefore, wastewater from these establishments is not considered residential septage unless the wastewater is solely human waste, such as from the restrooms only.

Transporter Requirements

Septage is regulated by DEP as a municipal waste. Therefore, haulers transporting septage must follow the transportation requirements for municipal waste, as well as some requirements specific to septage.



Registration

All transporters of septage must register with DEP. To register, a notification form *Residential Septage Hauler Registration* form (3800-FM-BPNPSM0252) available at www.dep.state.pa.us must be completed and submitted to DEP. Once received, DEP will issue a five-digit transporter number to the business or municipality transporting the septage.

The registration number must be displayed on the sides and rear of each vehicle the transporter uses. The number must be at least 3 inches tall and in a color contrasting to the background. If a hauler has more than one vehicle for hauling septage, then the number will be the same on every vehicle since it identifies the business, not the vehicle.

Vehicle Signage

Along with the registration number, additional information is required to be displayed on transportation vehicles. The name of the business; the address, including at a minimum the city, state and five-digit zip code; and "Municipal Waste" must be displayed on the vehicle. This information should be in letters 6 inches in height and must be clearly visible and easily readable. If space is limited, the lettering may be as close to 6 inches as possible, while still being visible and readable.

Fire Extinguishers

Transportation vehicles must be equipped with a fire extinguisher having an Underwriters' Laboratories (UL) rating of five B:C or more, or two fire extinguishers, each having a UL rating of four B:C or more. Each fire extinguisher must be labeled or marked with its UL rating; securely mounted to the vehicle; readily accessible to the driver and designed, constructed and maintained to permit visual determination of whether it is fully charged.

Collection and Transportation Equipment

The load compartments of septage vehicles must be leakproof and constructed to allow for easy cleaning. Cleaning should take place as frequently as necessary to prevent odors, vectors and other nuisances.

Cleaning areas should be constructed of impervious material that can be easily cleaned. Drainage from the cleaning area should be discharged to a sanitary sewer system or other treatment facility, or collected and transported to a facility that can treat the wash water. These actions are necessary to prevent surface water and groundwater pollution.

Recordkeeping

Records must be maintained for each load of septage that is collected and transported. These records must be kept in the cab of the vehicle hauling the septage and include, at a minimum, the county and state where the waste was collected; the name and address of the hauler transporting the

septage; the name and location of the transfer, processing or disposal facility where the septage has been or will be delivered; the weight or volume of the septage and a description of any handling problems or emergency disposal activities.

A transporter log (**Appendix A**) or other documentation containing this information must be used.

These records must be retained for at least five years and made available to DEP upon request.

Transportation to Permitted Facilities

It is the responsibility of the hauler to ensure that the septage is delivered to a permitted facility. Permitted facilities include wastewater treatment facilities, septage treatment facilities and land application sites. Most facilities are permitted and operated differently, so not all facilities will or are able to accept septage.

Other Agency Requirements

For additional requirements, the state and federal transportation agencies should be contacted as well as the county government(s) where hauling is to occur.

It is common in Pennsylvania for county governments to require licensing for hauling wastes in the county, as well as manifests for tracking wastes.

Processing and Disposal

All septage processing and disposal activities require a permit from DEP.

Processing is defined as technology used for the purpose of

reducing the volume or bulk of municipal or residual waste or technology used to convert part or all of the waste materials for offsite reuse. Processing facilities include, but are not limited to, transfer facilities, composting facilities and resource recovery facilities.

Transfer facilities receive and process or temporarily store waste at a location other



than the generation site then facilitate the transportation or transfer of the waste to a processing or disposal facility. This would include tanks or larger tank trucks used for bulking septage prior to transportation to a processing or disposal facility.

Other processing facilities for septage include municipal and private wastewater treatment plants and facilities used for treating septage prior to disposal or beneficial use.

Disposal is defined as depositing, injecting, dumping, spilling, leaking or placing of solid waste into or on the land or water in a manner that the solid waste or a constituent of the solid waste enters the environment, is emitted into the air or is discharged to the waters of the commonwealth. Disposal facilities include landfills and incinerators.

Land Application of Residential Septage

The land application of residential septage is a common reuse option in rural areas where other processing or disposal options are not as feasible. This beneficial use activity provides nutrients, water and, in most cases, lime to an agricultural site, where crops are being grown and harvested, or at a land reclamation site, such as a mining site.

The beneficial use of septage is regulated by DEP's regional office of Water Management. Anyone desiring to land apply residential septage must obtain coverage under a general permit (PAG-09 General Permit for Beneficial Use of Residential Septage by Land Application). Application for coverage under the PAG-09 is made by completing the Pennsylvania Notice of Intent for Coverage Under General Permit for Beneficial Use of Sewage Sludge by Land Application.

To protect public health and the environment, septage must be processed prior to land application. Processing



includes lime stabilization and screening to remove foreign and non-organic objects.

Lime (Alkali) Stabilization

The most widely used treatment for residential septage is lime stabilization. Hydrated lime is commonly used, due to its availability and its ability to be handled safely, although other alkali materials may be used. To meet the requirements for land application, the pH of the septage must be raised to 12.0 for 30 minutes without the addition of more lime.

Lime stabilization meets the requirement for both pathogen reduction and vector attraction reduction. Pathogen reduction is a decrease in the presence of disease causing organisms, such as parasites and viruses. Vector attraction reduction is a decrease or elimination of the characteristic of septage that attracts vectors such as flies or mosquitoes that can transmit disease.

A pH meter must be used to determine whether the pH requirement was met. The information in **Appendix B** should be used as a guide to get the best performance from a pH meter and to ensure that the pH monitoring is being done accurately and consistently. This information can also be used to help select a suitable pH meter.

A *Residential Septage Lime Stabilization Log* form (3800-FM-BPNPSM0104) available on DEP's website must be maintained to demonstrate that the pH requirement has been met for every load that has been land applied. This would include monitoring each truckload or each treatment/storage tank that is lime stabilized and land applied.

Screening

Many methods exist for the screening of residential septage. DEP does not have specific criteria for the screening of residential septage. Therefore, land appliers may use a screening mechanism that is best suited for their operation. Options for screening include screening at the site where the septage is being collected, screening out the back of the vehicle during application, or screening using a tank set-

up. During the permitting process, the method of screening must be specified.

Screenings must be transported to and disposed at a facility permitted to accept such wastes, such as a municipal waste landfill.

Site Requirements

The site where septage is land applied must meet the following criteria:

- Isolation distances, listed in Table 1, must be maintained from the designated features

Perennial Stream	100 feet
Edge of Sink Hole	100 feet
Exceptional Value Wetland	100 feet
Intermittent Stream	33 feet
Occupied Dwelling	300 feet
Water Source	300 feet
Seasonal High Water Table	11 inches
Regional Water Table	3.3 feet

- Slopes less than or equal to 25 percent for agricultural utilization or 35 percent for land reclamation
- Soil pHs greater than or equal to 6.0 prior to application, unless otherwise approved by DEP
- No threatened or endangered species may be impacted
- The site is not located in an area designated as an Exceptional Value Watershed
- The site has an implemented farm conservation plan or erosion and sedimentation control plan
- Livestock on the farm do not generate sufficient nutrients to satisfy the nutrient needs of the crops being grown on the farm

If a proposed land application area does not meet all of these criteria, then it may not be used for the land application of septage under a general permit.

If an individual permit is being utilized, the conditions in that permit must be satisfied.

Notifications

Once coverage of the general permit is obtained and a site is located that meets the requirements for land application, the permittee must obtain written consent from the property owner.

Information must be given to the landowner and occupant of the land concerning the requirements for land application at least seven days prior to first application.

The hauler must also send notifications, at least 30 days prior to first application, to DEP, the County Conservation District where the land application site is located and landowners adjacent to the site.

Site Management

In addition to the criteria listed in the Site Requirements section, the following requirements must be met during land application activities.

The permittee must calculate the maximum amount of septage that may be applied using the *Residential Septage Annual Agronomic Loading Rate Worksheet* (3800-FM-BPNPSM0072) available on DEP's website and the Annual Application Rate formula. The *Residential Septage Annual Agronomic Loading Rate Worksheet* takes into consideration other nitrogen sources, such as chemical fertilizers and manure that may be applied to the field. Septage applications may not exceed the rates calculated using the worksheets.

Land application may not occur when the ground is flooded, frozen or snow covered.

Once application has occurred, the farm operator must adhere to the following harvest restrictions for food, feed and fiber crops. Food crops are crops consumed by humans, feed crops are crops produced primarily for consumption by animals and fiber crops are crops used to produce fibers, such as cotton.

- Food crops with harvested parts that touch the septage/soil mixture and are totally above the land surface may not be harvested for 14 months after application of the septage

- Food crops with harvested parts below the surface of the land may not be harvested for 20 months after application of septage when the septage remains on the land surface for four months or longer prior to incorporation into the soil
- Food crops with harvested parts below the surface of the land may not be harvested for 38 months after application of septage when the septage remains on the land surface for less than four months prior to incorporation into the soil
- Food crops, feed crops and fiber crops may not be harvested for 30 days after application of septage

Training

DEP requires persons land applying septage to complete DEP-sponsored training courses in a timely and satisfactory manner. For land appliers of residential septage, at least one person with responsibility for the land application shall satisfactorily complete the training. The

training must be completed within one year from the beginning of land application activities.

Porta-pot, Grease Trap and Other Wastes

Wastes that do not meet the definition of residential septage may not be land applied under a PAG-09 general permit. This includes porta-pot and grease trap wastes.

Alternative disposal methods must be used for these wastes.

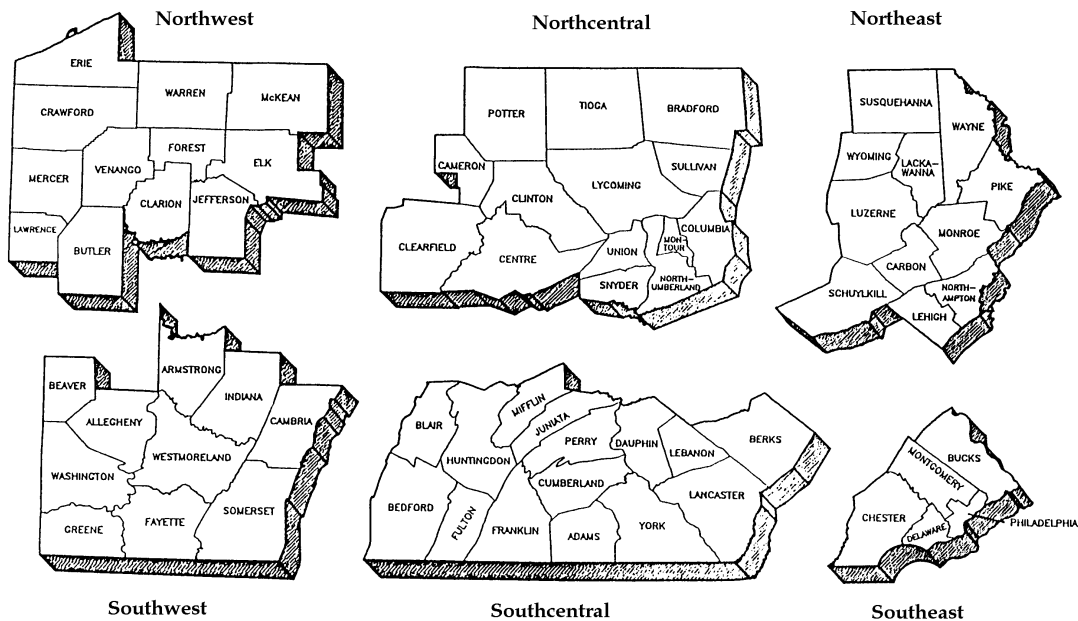
For information concerning the transportation, processing and disposal of residential septage, contact DEP's regional office of Waste Management.

For information concerning the beneficial use of septage, contact DEP's regional office of Water Management.

For more information, visit www.dep.state.pa.us, keyword: Biosolids.

For more information,
call the DEP regional office in your area or contact:

Department of Environmental Protection
Bureau of Point and Non-Point Source Management
P.O. Box 8774
Harrisburg, PA 17105-8774
(717) 787-8184



DEP REGIONAL OFFICES

Southeast Region

2 E. Main St.
Norristown, PA 19401
Main Telephone: 484-250-5900
24-Hour Emergency: 484-250-5900

Counties: Bucks, Chester, Delaware, Montgomery and Philadelphia

Southwest Region

400 Waterfront Drive
Pittsburgh, PA 15222-4745
Main Telephone: 412-442-4000
24-Hour Emergency: 412-442-4000

Counties: Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland

South-central Region

909 Elmerton Ave.
Harrisburg, PA 17110-8200
Main Telephone: 717-705-4700
24-Hour Emergency: 877-333-1904

Counties: Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York

Northwest Region

230 Chestnut St.
Meadville, PA 16335-3481
Main Telephone: 814-332-6945
24-Hour Emergency: 1-800-373-3398

Counties: Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren

Northeast Region

2 Public Square
Wilkes-Barre, PA 18701-1915
Main Telephone: 570-826-2511
24-Hour Emergency: 570-826-2511

Counties: Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming

North-central Region

208 W. Third St., Suite 101
Williamsport, PA 17701
Main Telephone: 570-327-3636
24-Hour Emergency: 570-327-3636

Counties: Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union

APPENDIX B

pH METER AND RECORDKEEPING REQUIREMENTS

After alkali addition, the pH must be monitored using a meter with an electrode system.

Accuracy: All meters must be able to measure to the nearest 0.1 pH units.

Calibration: All meters must be able to perform, at a minimum, a two-point calibration.

Calibration

Meters must be calibrated on a daily basis, or each time the unit is used in measuring samples. Calibration should be performed as described by the meter manufacturer.

Buffers

Use pH buffer solutions of 7.0 and 10.0 for two-point calibrations.

Use pH buffer solutions 4.0, 7.0 and 10.0 for three-point calibrations.

Powdered Buffer Solutions

If the buffers come in powdered forms, mix with distilled or deionized water (approximately 50 mL), or per manufacturer's specifications.

Shelf life of mixture \approx 2 to 3 days. Keep covered when not in use.

Premixed Buffer Solutions

If the buffer solution is premixed, pour 50 mL in a small beaker, or clean container, for calibration purposes.

Do *not* pour back into main container.

Shelf life of 50 mL solution \approx 2 to 3 days. Keep covered when not in use.

Slope

The slope is an important part of the calibration process. It will verify the accuracy of the calibration performed.

Units that display calibration slopes should have a slope of -57.0 to -62.0 , 57.0 to 62.0 , or 95.0 to 105.0 , depending on the individual meter. If the meter's slope is outside the range, it should be recalibrated. If it is consistently outside of the slope range, then problems may be occurring due to wear of the meter or the probe. If this is the case the probe or/and meter may need to be replaced.

For **Units that do not display calibration slopes**, the accuracy of the calibration should be verified by conducting the following procedure:

- Add 5 grams of hydrated lime to 100 to 300 mL of room temperature (25 C or 77 F) tap water.
- Stir to mix solution.
- Take a pH reading. The pH should be between 12.4 and 12.5. If the pH is outside of this range, then the slope is inaccurate and a calibration must be conducted again. If it consistently does not pass this test, then problems may be occurring due to wear of the meter or the probe. If this is the case the probe or/and meter may need to be replaced.

Temperature Compensation

Automatic Temperature Compensation

Meters/probes that have an automatic temperature compensation feature allow the user to measure the pH of the sludge at variable temperatures. However, pH readings must be compensated to 25 C. Use the following formula to determine the actual pH needed to conduct lime or alkali stabilization.

$$\text{Correction Factor} = -0.03 \text{ pH units} \times (25 \text{ C} - T_{\text{C measured}}) \quad (\text{Eq. 1})$$

$$\text{Corrected pH} = \text{Measured pH} + \text{Correction Factor} \quad (\text{Eq. 2})$$

For example, septage measured at 15 C with a pH of 12.3 would be equivalent to a pH of 12.0 at 25 C.

A temperature compensation chart is included with the lime stabilization log in Appendix D.

Automatic Temperature Compensation Probes are highly recommended for field samples.

Non-Temperature Compensation

Buffer solutions must remain at approximately 25 C or 77 F during calibration procedures.

Septage samples must be measured at approximately 25 C or 77 F.

This will require that the temperature of the buffer solution and sample be monitored using a thermometer.

The target pH for lime or alkali stabilization will always be 12.0.

General Probe Maintenance

Soak in 0.1 N hydrochloric acid (HCl) for 15 minutes, weekly or as recommended by the manufacturer.

Keep the probe in pH storage solution (potassium chloride, KCl) when not in use.

Keep probe clean of debris.

Approved pH Methods

SM-4500-H⁺

This method is used to measure pH for liquid samples. All information mentioned above applies to this method.

Continuously stir sample when taking sample pH readings.

