



Land Application of Septage

Ken Arnold, Chief of Land Application, Missouri Department of Natural Resources
John Dunn, Environmental Engineer, Environmental Protection Agency Region VII
Charles Fulhage, Agricultural Engineering, University of Missouri-Columbia

Septage is the material pumped from residential septic tanks and similar treatment works.

The standards for biosolids from septage differs from other sludges. This publication addresses state and federal regulations and standards.

EPA regulations, under Title 40 Code of Federal Regulations Part 503 (40 CFR 503), establish the minimum national standards for the use and disposal of domestic sludge. The standards include limiting biosolids applications to land, including septage.

Biosolids land application

Biosolids is domestic wastewater sludge that meets standards for use as a fertilizer or soil conditioner. These standards for septage include pathogen reduction, vector requirements and best management practices.

Applying biosolids to the land uses the available nitrogen, phosphorus and potash as fertilizer for growing crops. It is an environmentally sound practice sanctioned by the U.S. Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources (DNR).

Reusing biosolids on crops, pastures and timberland reduces pollution of the waters of the state. It eliminates the environmental risks and costs associated with sludge disposal options, benefiting all Missouri citizens.

Contract hauler

Under state and federal regulations, the contract hauler is responsible for complying with all sludge regulations for septage pumping, including final disposal. The contract hauler must meet all requirements.

Haulers who land apply septage (biosolids) must obtain a state permit. Haulers who transport to another permitted treatment facility are not required to have a permit. Homeowners are not responsible for sludge removed by contract haulers.

Compliance dates

Since Feb. 19, 1994, contract haulers that apply septage must comply with the new EPA sludge standards. They must register with EPA or apply for state permits. A general permit is available from the DNR.

Best management practices

Septage biosolids that meet the standards for pathogens and vectors are safe to apply when following best management practices.

Best management practices include agronomic loading rates, soil conservation practices and other site restrictions. For more information, see MU publication WQ 426, *Best Management Practices for Biosolids Land Application*.

Metals standards

Monitoring and limitations for metals are not required because of the relatively low concentration of metals found in residential septage. (See Table 1.)

Pathogen and vector requirements

Residential septic tanks are designed to retain sludge for one to three years before pumping. This long retention time provides a larger reduction in

pathogens and vectors in the tank, as compared to other mechanical-type treatment facilities.

Therefore, federal regulations provide a special category for lime stabilization of septage. For more information, see MU publication WQ 424, *Biosolids Standards for Pathogens and Vectors*.

Lime stabilization

Lime stabilization of septage is recommended to meet pathogen and vector requirements for biosolids applied to crops, pastures or timberland. To meet Class B sludge requirements, maintain the septage at 12 pH for at least 30 minutes before land application.

Add 50 pounds of hydrated lime to each 1,000 gallons of septage. Use an auxiliary vacuum line to pump the dry lime into the tank truck as the septage is pumped into the tank, and uniformly mix the materials in the tank.

Do not add the lime to the septic tank, as this will harm the beneficial bacteria needed in the septic tank.

Land application rates

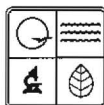
Do not apply more than 30,000 gallons of septage per acre per year. This rate is suitable for all agricultural crops, pastures or timberland in Missouri. Since this is a conservative rate, nitrogen testing of the septage is not required. (See Table 1.)

For a higher application rate, see nitrogen testing and loading limits in MU publication WQ 426, *Best Management Practices for Biosolids Land Application*.

Recordkeeping

Keep detailed reports on file for at least five years showing the number of acres, location, ownership and application dates for each land-application field. The records must be available for inspection by the DNR.

Annually summarize and submit the records in a calendar year report due Jan. 28. An annual report form (Form S) is provided by the DNR and has been approved for use by the EPA.



Published with funds provided to the Missouri Department of Natural Resources from the Environmental Protection Agency, Region VII. To learn more about water quality and other natural resource issues, contact the Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102. Toll free 1-800-334-6946



■ Issued in furtherance of Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Ronald J. Turner, Director, Cooperative Extension, University of Missouri and Lincoln University, Columbia, MO 65211. ■ University Extension does not discriminate on the basis of race, color, national origin, sex, religion, age, disability or status as a Vietnam era veteran in employment or programs. ■ If you have special needs as addressed by the Americans with Disabilities Act and need this publication in an alternative format, write ADA Officer, Extension and Agricultural Information, 1-98 Agriculture Building, Columbia, MO 65211, or call (314) 882-8237. Reasonable efforts will be made to accommodate your special needs.

Typical concentrations of pollutants in residential septage

Pollutant	Average concentration of dry weight (mg/kg)*
Arsenic	4
Cadmium	4
Chromium	14
Copper	140
Lead	35
Mercury	0.15
Molybdenum**	less than 4
Nickel	15
Selenium	2
Zinc	290
Nitrogen	2 percent
Phosphorus	less than 1 percent
Total solids	3.4 percent
pH	6 - 7 pH units

*Other units as noted.

**Estimate based on relative ratio of data in the 1988 National Sewage Sludge Survey (NSSS), U.S. Environmental Protection Agency (EPA), October 1989. Septage values are in the lower 10 percent of NSSS data. Unpublished statistical comparison by Missouri Department of Natural Resources using an EPA computer file of the NSSS data base.

Table 1. Typical concentrations of pollutants in residential septage. (Domestic Septage Regulatory Guidance, EPA-832-B-92-005, September 1993. U.S. Environmental Protection Agency.)

Similar treatment works

The EPA defines septage in 40 CFR 503.9 (F). It includes pumping from septic tanks, cesspools, portable toilets, Type III marine sanitation devices and similar treatment works that receive only domestic sewage.

Sludge from domestic wastewater treatment facilities serving less than 150 people is considered equivalent to septage by DNR. Therefore, these "similar treatment works" may follow the requirements for septage in this publication.