REPORT ON ALTERNATIVE METHODS FOR THE TREATMENT AND DISPOSAL OF SEPTAGE

Bureau of Onsite Sewage Programs

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State Surgeon General

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Executive Summary

Section 381.0065(7), Florida Statutes, requires the land application of septage to be discontinued by January 1, 2016. The section further requires the Department of Health to prepare a report on alternative methods for the treatment and disposal of septage.

Approximately 100,000 onsite sewage treatment and disposal systems are pumped each year generating 100 million gallons of septage requiring treatment and disposal. Currently this septage is treated and disposed of at a number of DEP-regulated and DOH-regulated septage treatment facilities. The treated septage is then land applied at DEP-regulated and DOH-regulated land application sites. Existing state rules applicable to septage treatment and land application meet the federal standards in 40 CFR Part 503.

Current alternatives to land application of septage include treatment at a Wastewater Treatment Facility (WWTF) with subsequent application at DEP-regulated sites or dewatering with subsequent disposal at a sanitary landfill. These alternatives are generally used in areas of greater density of population where availability and proximity of central facilities make them more economically attractive than transport to and disposal on open land. The distance between central facilities with available treatment capacity and septage collected in rural areas can make transport to such facilities cost prohibitive. Central facilities refusing to accept septage containing restaurant waste and counties prohibiting disposal of septage from another county can exacerbate the situation. Longer transport distances disproportionately impact the smaller hauling businesses that have fewer and smaller trucks and may render them unable to successfully compete.

Costs to local governments and small businesses owning the treatment facilities vary based on the treatment alternative selected and volume of septage treated. Costs to small businesses servicing the onsite sewage systems vary based on fees charged by treatment facilities and distance to the treatment facility. Costs to individuals and small businesses having their onsite systems serviced are affected by the treatment alternative selected and the fees charged by the service company.

To discontinue land application, the department recommends the following:

1. Legislation requiring local governments to make provision for the treatment and disposal of septage generated within their geographic jurisdiction.
2. Legislation requiring county comprehensive plans to include provision for the treatment and disposal of septage if the plan includes areas already developed or to be developed using septic tanks.
3. Legislation requiring WWTFs to make provision for receiving and treating septage if there are septic systems within their franchise area.
4. Legislation that provides incentives for WWTFs and landfills to accept grease.
5. Legislation requiring local governments to provide for the disposal of grease.

The land application of septage at DOH-regulated land application sites could be eliminated within two years following the availability of sufficient, reasonably located, alternative treatment facilities that are actively accepting septage. Because of the cost to businesses and individuals and lack of alternatives in more rural areas of the state, the department recommends that, instead of being discontinued, land application practices be enhanced with increased third-party inspection and oversight along with enhanced nutrient and soil sampling.

REPORT ON ALTERNATIVE METHODS FOR THE TREATMENT AND DISPOSAL OF SEPTAGE

Introduction

This report is prepared in response to S. 381.0065(7), Florida Statutes, as amended in 2010, which reads:

> (7) LAND APPLICATION OF SEPTAGE PROHIBITED.—Effective January 1, 2016, the land application of septage from onsite sewage treatment and disposal systems is prohibited. By February 1, 2011, the department, in consultation with the Department of Environmental Protection, shall provide a report to the Governor, the President of the Senate, and the Speaker of the House of Representatives, recommending alternative methods to establish enhanced treatment levels for the land application of septage from onsite sewage and disposal systems. The report shall include, but is not limited to, a schedule for the reduction in land application, appropriate treatment levels, alternative methods for treatment and disposal, enhanced application site permitting requirements including any requirements for nutrient management plans, and the range of costs to local governments, affected businesses and individuals for alternative treatment and disposal methods. The report shall also include any recommendations for legislation or rule authority needed to reduce land application of septage.

Current Situation

Septage is the material that is removed from septic tanks and other onsite sewage treatment and disposal systems when they are cleaned. In addition to septage, onsite systems serving restaurants include tanks that separate grease from the sewage stream and that grease is hauled, treated and land applied similarly to septage. Therefore any discussion of septage treatment and disposal should include some discussion of grease treatment and disposal. Currently there are approximately 2.6 million onsite sewage systems in the state containing, at any time, upwards of 2.6 billion gallons of septage. The United States Environmental Protection Agency (EPA) and the Department of Health (DOH) recommend that onsite systems be cleaned every three to five years in order to assure proper continued operation of the system (Onsite Wastewater Treatment Systems Manual, EPA, 2002). While approximately 13,500 onsite systems are currently under some form of routine maintenance contract, property owners frequently neglect the remaining systems resulting in a pumping frequency much less than that recommended. Nevertheless, approximately 100,000 systems are pumped each year generating 100 million gallons of septage requiring treatment and disposal.

DOH has jurisdiction over septage treatment facilities treating up to 10,000 gallons of septage per day. Department of Environmental Protection (DEP) has jurisdiction over larger septage treatment facilities and any facility that additionally treats Wastewater Treatment Facilities (WWTF) residuals. DOH has jurisdiction over land application sites receiving treated septage only from DOH-regulated septage treatment facilities. There are currently 92 land application sites regulated by the DOH receiving septage treated at 108 DOH-regulated septage treatment facilities. Approximately 40% of the septage removed from onsite sewage treatment and disposal systems is treated at septage treatment facilities and then taken to the land application sites. The remainder of the septage is taken to a WWTF or is dewatered with the liquid fraction going to a wastewater treatment plant and the solid fraction going to a municipal landfill facility. WWTFs and landfills are more frequently used as an alternative in more populous settings while land application sites are more likely in rural areas. Availability of open land versus the

proximity to centralized treatment facilities and the cost of centralized treatment facilities impact the economics and logistics that drive the decision whether to use land application or an alternative. Many WWTFs and sanitary landfills choose not to accept loads of septage that include restaurant waste containing grease. This choice can make land application the only available option for the disposal of grease. Other alternatives such as incineration, bioenergy production and conversion to fertilizer have not yet captured a significant portion of the septage treatment industry and would require large capital commitments from government or industry.

DOH requirements for the land application of septage are in rule 64E-6.010, Florida Administrative Code. The state requirements achieve the federal requirements for the treatment and land application of septage regarding treatment levels and application site location and management (EPA 40CFR Part 503). The septage is screened for litter and then treated with lime to raise the pH to 12 for a minimum of two hours or to 12.5 for thirty minutes. While the lime stabilization alone meets the federal requirements for septage treatment and land application, the state rule includes site restrictions that the federal regulations apply only to untreated septage. Finally, the state rule echoes federal regulations for nitrogen loading restrictions and requires further limitations for phosphorous where required by state law.

Alternatives to Land Application of Septage

Treatment of Septage at Domestic Wastewater Treatment Facilities - There are some benefits of treating septage at a WWTF. Treating septage takes advantage of available WWTF capacity while at the same time centralizing waste treatment operations. However, accepting septage, which is a high strength waste, has the potential to upset WWTF processes and may result in a variety of increased operation and maintenance requirements and costs. Septage can be added to the liquid treatment system, the biosolids handling system, or a combination of the two. Allowable loadings are site specific and vary depending on the WWTFs treatment processes and their design capacity. The quantity of septage that can be treated is normally limited by the facility's available aeration and/or solids handling capacity. Both the available organic and hydraulic capacity must be evaluated to determine if it is possible for a WWTF to consider accepting septage.

Adverse impacts of septage addition increase significantly if septage is discharged as a slug load (e.g., directly from the septage hauler's truck to the main lift station or headworks of the WWTF). As a result if a WWTF is going to accept septage, septage receiving facilities (e.g., holding tanks) are extremely desirable. The receiving facilities must be designed to allow septage addition to the liquid treatment system at a relatively constant, controlled rate, (i.e., "slow bleed") minimizing the potential for short term overloading of downstream processes. Assuming a holding tank is provided and that septage is added to the sewage flow on a semi-continuous basis, Figure 6-5 of EPA's "Septage Treatment and Disposal" handbook provides estimates of allowable rates of septage addition. For example, a conventional activated sludge plant with a primary clarifier designed for 10 million gallons per day (mgd) and operating at 80 percent of design capacity should be able to receive a septage flow of 0.6 percent of 10 mgd, or 60,000 gallons per day. A 10 mgd extended aeration plant operating at 70 percent design capacity should be able to receive 0.4 percent of 10 mgd, or 40,000 gallons per day.

A variety of methods may be used to treat septage in the biosolids handling system. The septage may be treated by adding it directly to the WWTFs chemical conditioning system or to the WWTFs aerobic/anaerobic digesters. Also, the septage may be added directly to the WWTFs biosolids dewatering process which would require further treatment to stabilize the septage if land application is used as opposed to landfill disposal.

Septage addition at a WWTF increases operation and maintenance requirements. Records of septage sources and volumes and routine sampling are parts of a comprehensive management program. Record keeping and sampling protocols deter haulers from discharging incompatible materials, such as industrial wastes. In addition, this information can be helpful if an upset occurs in the treatment process. Operational data such as biosolids production, chemical and power consumption, and grit and screening volumes should be monitored to assess the impact of septage on overall plant operation.

Larger WWTFs are more capable of accepting septage. While Florida has over 2,000 WWTFs, only 60 WWTFs have capacities over 10 mgd. Less than 30% of the counties in Florida have a WWTF rated over 10 mgd located within that county. Some large WWTFs choose not to accept grease with septage and that necessitates the transport of grease for separate treatment land application. Areas served by OSTDSs need to be within an economical hauling distance of a WWTF willing to accept septage. Rural areas frequently have no large WWTF within an economical hauling distance. As some counties prohibit the acceptance of septage from another county, the hauling distance can be increased prohibitively. These centralized facilities in the rural areas will necessitate longer transport distances and disproportionately impact the smaller hauling businesses having fewer and smaller trucks. Many smaller business owners are predicting that they may not be able to successfully compete.

Currently, wastewater treatment facilities commonly charge the septage haulers (small businesses) $60 to $120 for treatment and disposal of 1,000 gallons of septage. The industry estimates that the increase in costs for disposal fees and transport to an available facility would double and in some cases triple the existing cost to homeowners and small businesses that need to have their systems serviced. The facility hardware cost required at the WWTF would vary from negligible if the septage were simply offloaded into the headworks; to $50,000 to $200,000 for storing and slowly metering 40,000 gallons per day into the facility; to $3,650,000 to treat 40,000 gallons per day separately from the WWTF stream. The upgrades to the WWTF would be a cost to local government if the utility were owned by the local government. In addition, continuing costs for manpower, energy, and equipment maintenance, repair and replacement would likewise be factored into the WWTF operation expense.

Disposal of Septage at Landfills - Another option for septage disposal is acceptance at a permitted, Class I landfill. Acceptance of septage at a landfill increases microbial activity within the landfill and results in increased waste decomposition and more rapid waste stabilization. However, landfill instability (such as differential settlement and slope instability) may result due to disposal of the wet waste stream, and increased difficulty in operating compaction equipment may result due to creation of a slick working surface. Also, if not quickly covered with initial cover, the landfill may experience increased odors; health impacts on workers due to pathogens; and attraction of vectors such as birds, insects, and rodents. Lined Class I landfills offer containment and management of potential contaminants that may result from septage disposal. In contrast to land application of treated septage, landfill disposal requires less area than land application, and no additional land is required if septage is managed at an existing landfill. There are presently 48 active Class I landfills in the state.

Disposal of septage in a Class I landfill must be in accordance with Chapter 62-701, F.A.C. Rule 62-701.300(10), F.A.C., prohibits the discharge of septage in a landfill unless it passes the Paint Filter Liquids Test using Method 9095B as described in “Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods” (EPA Pub. No. SW-846). The Paint Filter Test is conducted by placing a 100-milliliter sample of waste on a conical 400-micron paint filter. If

liquid passes through the filter in 5 minutes, the waste is considered a free liquid, and thus fails the test and cannot be landfilled. Because septage is typically about 2 to 3% total solids and it takes about 12% total solids to pass the paint filter test, significant dewatering is required for landfill disposal. Dewatering equipment, such as a belt filter press, would need to be installed or be available at the landfill or other location. The effluent from dewatering equipment would need to be routed to a wastewater disposal system or sewer, perhaps with the landfill leachate. Operators at some Class I landfills have also added other materials to liquid wastes like saw dust or soils so that the mixture passes the Paint Filter Test. If allowed in the landfill permit, this also may be an option in some cases for managing the septage.

Current dewatering/landfill operations charge the septage haulers (small businesses) approximately $100 per 1000 gallons of septage. The industry estimates that the increase in costs for disposal fees and transport to an available facility would double the existing cost to homeowners and small businesses that need to have their systems serviced. These centralized facilities in the rural areas will necessitate longer transport distances and disproportionately impact the smaller hauling businesses having fewer and smaller trucks. Many smaller business owners are predicting that they may not be able to successfully compete. The facility hardware for dewatering 40,000 gallons per day would cost approximately $200,000. Such a facility, if located at the landfill, would be a cost likely borne by the local government that operated the landfill. Continuing costs for manpower, energy, and equipment maintenance, repair and replacement would likewise be factored into the dewatering/landfill facility operation expense.

Increasing the Treatment Level for Land Application

As the current practice of lime stabilization for two hours at a pH of 12 meets the federal regulations, the necessity of higher levels of treatment is questionable.

A 40,000 gallon per day (40 homes per day) stand-alone treatment facility to produce biosolids meeting Class-A requirements comes with a cost estimate of $3,650,000 for the treatment facility. Such a facility would likely be owned by a small business such as a septage hauler or a local government or municipality if located at a wastewater treatment facility.

Possible Enhancements to Existing Land Application Practices

Current land application rules meet the requirements for nutrient reduction and management under the federal regulations. The enhancements listed below would be above what EPA currently requires for septage management and land application but may address concerns that lead to the requirement to discontinue land application by January 1, 2016.

Enhancing existing land application practices rather than requiring the implementation of higher-cost alternatives could avoid the possible unintended consequences of individuals seeking unapproved disposal alternatives that adversely impact quality of life, public health and the environment.

1. Require third-party oversight of septage treatment and land application activities:

    - Class C WWTF Operator visits to oversee operations.
    - Increase frequency of DOH inspections.
    - Establish regional DOH inspections.
    - Limit application sites to use by one applier only.

2. Change Operational Procedures:

- Metered receiving at treatment facilities.
- Require larger stabilization and holding tanks at treatment facilities.
- Require longer treatment exposure times and post-treatment holding times.
- Require electronic pH meters to replace testing with paper strips.
- Require sampling of stabilized septage.
- Tracking yearly nutrient loading based on septage sampling.
- Require annual soil sampling of active application sites.

The listed enhancements to existing land application practices could be accomplished within the existing statutory rulemaking authority for DOH-regulated septage treatment and application sites.