

**CITY OF CROSSVILLE, TENNESSEE
BID SPECIFICATIONS
FOR
BIOSOLIDS FROM THE WASTEWATER TREATMENT FACILITY**

NOVEMBER 2013

Sealed Bids will be received by the City of Crossville, Tennessee, at the City Hall, 392 North Main Street, Crossville, Tennessee 38555, on or before 2:00 pm., C.D.T. on December 3, 2013. The envelope containing the Bid must be sealed and plainly marked "Bid for Purchase and Removal of Biosolids".

The City reserves the right to reject any or all Bids regarding the purchase and removal of Biosolids, to waive irregularities and/or informalities in any Bid, and to make an award in any manner, consistent with law, deemed in the best interest of the City.

INSTRUCTIONS TO BIDDERS

CONDITIONS

Each Bidder shall fully acquaint itself with all rules and regulations relating to the land application of Biosolids and any restrictions attending the execution of the work under Contract. Bidders shall thoroughly examine and be familiar with the Specifications. It is also expected that the Bidders will obtain information concerning the conditions at locations where land application may occur and that may affect its work.

The failure or omission of any Bidder to receive or examine any form, instrument, addendum or other document, or to acquaint itself with existing conditions, shall in no way relieve it of any obligations with respect to his Bid or to the Contract. The City shall make all such documents available to the Bidder.

The Bidder shall make its own determination as to conditions and shall assume all risk and responsibility and shall complete the work in and under conditions it may encounter or create, without extra cost to the City.

The Bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over the work to be performed shall apply to the Contract throughout, and they will be deemed to be included in the Contract as though written out in full in the Contract.

BID SPECIFICATIONS

City of Crossville Wastewater Treatment Facility Biosolids Bid Specifications

- Biosolids bid based on total annual volume (approximately 2,000 – 2,400 tons) at a unit price per ton.
- Individual dump truck volume for purpose of billing will be established by certified scale weight on initial ten loads (per single axle or tandem axle).
- Bidder will be responsible for scale weigh cost.
- After established truck load biosolids tonnage, successful bidder will be billed monthly on tonnage of biosolids picked-up based on established average tonnage per single axle or tandem axle dump truck.
- Successful bidder will become familiar with Environmental Protection Agency Biosolids Rules, Tennessee Department of Environmental and Conservation Bio-solids Rules (Chapter 0400-40-15, Bio-Solids Management) and UT Agriculture Extension Service Best Management Practices (BMPs) for Land Application of Bio-solids. Crossville Biosolids meet EPA 40 CFR 503 Class A requirements and may be used for agriculture beneficial reuse under this classification. General Best Management Practices requirements must be followed by the successful bidder.
- Biosolids must be picked up Monday – Friday during working hours 7 a.m. – 4 p.m. Trucks must be DOT approved and properly maintained. Haulers should avoid residential areas where alternate routes exist. Haulers must avoid spills to highway and submit a protocol to avoid spills and clean up procedures. Trucks must avoid tracking onto highways.
- Land application of biosolids must be managed to minimize risk of nuisance to nearby residence and property owners by observing wind conditions and buffer zones.
- Successful bidder is recommended to complete annual soil test and apply biosolids at recommended agriculture agronomic rates based on biosolids analysis data provided. AG Lime equivalence average 75-80%, other nutrients include nitrogen, phosphorus and potassium.

- When stockpiling, successful bidder must make every effort to minimize risk of drainage to waterways or surrounding properties. Sites with slopes in excess of 8-12% should be avoided.
- Successful bidder will pick up biosolids monthly (minimum 15 loads at a time) with a minimum of seven (7) days notification. Bidder will load biosolids. City of Crossville loader may be used by truck driver if experienced and qualified to operate loader. Bidder may also provide own loader.
- Successful bidder will relinquish agreement to next highest bidder if requirements are not met.

NAME, ADDRESS, AND LEGAL STATUS OF THE BIDDER

The Bid must be properly signed in ink and the address of the Bidder given. The legal status of the Bidder whether corporation, partnership, or individual, shall also be stated in the Bid.

A corporation shall execute the Bid by its duly authorized officers in accordance with its corporate by-laws and shall also list the state in which it is incorporated. A partnership Bidder shall give full names of all partners. Partnership and individual Bidders will be required to state in the Proposal the names of all persons interested therein.

The place of residence of each Bidder, or the office address in the case of a firm or company, with county and state and telephone number, must be given after his signature.

If the Bidder is a joint venture consisting of a combination of any or all of the above entities, each joint venturer shall execute the Bid.

Anyone signing a Bid as an agent of another or others must submit with his Proposal, legal evidence of his authority to do so.

COMPETENCY OF BIDDER

The opening and reading of the Proposal shall not be construed as an acceptance of the Bidder as a qualified, responsible Bidder. The City reserves the right to determine the competence and responsibility of a Bidder from its knowledge of the Bidder's qualifications or from other sources.

The City shall require submission with the Bid of the following supporting data regarding the qualifications of the Bidder in order to determine whether it is a qualified, responsible Bidder.

The Bidder will be required to furnish an itemized list of the Bidder's equipment available for use on the Contract.

PRE-BID CONFERENCE

A mandatory pre-bid conference is scheduled at the City of Crossville's Wastewater Treatment Facility, 486 Sparta Highway, Crossville, Tennessee, at 10:30 a.m. on November 14, 2013.

SCOPE OF CONTRACT

The work to be done consists of furnishing all labor, tools, equipment and materials, supplies and services necessary to satisfactorily land apply Biosolids at locations within the limits of Cumberland County, Tennessee.

The obligation to make payments to the City shall begin when the successful Bidder begins hauling/removing Biosolids away from the Facility.

It shall be the responsibility of the Contractor to require all vehicles to be free of Biosolid waste that can be blown or fall from a vehicle after leaving the Facility.

It shall be the responsibility of the Contractor to take all steps necessary to minimize any complaints about odors when Biosolids are land applied.

Holidays - The following shall be holidays for purposes of this Contract:

New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day and the day after
Christmas Eve and Christmas Day

Point of Contact - All dealings, contacts, etc., between the successful Bidder and the City shall be directed to the Mr. Clark Annis, Manager of Wastewater Facilities and to the City: Attn. City Manager.

COMPLIANCE WITH LAWS

The successful Bidder shall conduct operations under this Contract in compliance with all applicable local ordinances, state rules, regulations and law, and federal laws.

EFFECTIVE DATE

This Contract shall be effective upon the execution of the Contract and performance of such Contract shall begin on January 2, 2014.

INDEMNITY

The Contractor will indemnify and save harmless the City, its officers, agents, servants, and employees from and against any and all suits, actions, legal proceedings, claims, demands, damages, costs, expenses, and attorneys' fees to the extent resulting from a willful or negligent act or omission of the Contractor, its officers, agents, servants, and employees in the performance of this Contract; provided, however, that the Contractor shall not be liable for any suits, actions, legal proceedings, claims, demands, damages, costs, expenses and attorneys' fees arising out of the award of this Contract or a willful or negligent act or omission of the City, its officers, agents, servants and employees.

TERM

The contract shall be for a one (1) year period beginning January 2, 2014, and ending December 30, 2014. The City may extend the contract for another year.

INSURANCE

The Contractor shall at all times during the Contract maintain in full force and effect Automobile Liability, Public Liability and Property Damage Insurance, including contractual liability and products coverage. All insurance shall be provided by insurance companies with an A.M. Best rating of A or higher. All policy limits shall be acceptable to the City and before commencement of work hereunder the Contractor agrees to furnish the City certificates of insurance or other evidence satisfactory to the City to the effect that such insurance has been procured and is in force. The City of Crossville must be named as additionally insured in all policies. The certificates shall contain the following express obligation:

"This is to certify that the policies of insurance described herein have been issued to the insured for whom this certificate is executed and are in force at this time."

For the purpose of the Contract, the Contractor shall carry the following types of insurance in at least the limits specified below:

Coverages	Limits of Liability
Bodily Injury Liability Except Automobile	\$1,000,000 each occurrence \$1,000,000 aggregate
Property Damage Liability Except Automobile	\$1,000,000 each occurrence \$1,000,000 aggregate
Automobile Bodily Injury Liability	\$1,000,000 each person \$1,000,000 each occurrence
Automobile Property Damage Liability &Property Damage including uninsured/ under insured motorist	\$1,000,000 each occurrence

To the extent permitted by law, all or any part of any required insurance coverages may be provided under a plan or plans of self-insurance. The coverages may be provided by the Contractor's parent corporation.

It is strongly recommended that the Contractor carry Worker's Compensation coverage at the statutory limit.

REMEDIES OF THE CITY

Upon default by Contractor, the City shall have the right to terminate Contractor's rights under this Contract, and the City may take possession of the Biosolids and dispose of the same, by contract or otherwise, and Contractor shall be liable to the City for any fees owned the City.

TRANSFERABILITY OF CONTRACT

Other than by operation of law, no assignment of the Contract or any right accruing under this Contract shall be made in whole or in part by the Contractor without the express written consent of the City, which consent shall not be unreasonably withheld; in the event of an assignment, the assignee shall assume the liability of the Contractor.

CONTRACT NOT A FRANCHISE

It is the understanding and intention of the parties hereto that this agreement shall constitute a contract for the purchase and removal of Bio-Solids; that said Contract shall not constitute a franchise; nor shall the same be deemed or construed as such.

CONTRACT

THIS CONTRACT, made and entered into this ___ day of _____, 201_, by and between the City of Crossville, a Municipal Corporation of Cumberland County, Tennessee, (hereinafter called the "City"), and _____ (hereinafter called "Contractor").

WITNESETH:

WHEREAS, the Contractor did on the ___ day of _____, 201_, submit a Bid to purchase and remove Biosolids from the City of Crossville's Wastewater Treatment Facility within the City and to perform such land application work as may be incidental thereto.

NOW, THEREFORE, in consideration of the following mutual agreements and covenants, it is understood and agreed by and between the parties hereto as follows:

The Contractor is hereby granted a contract for the purchase and removal of Bio-solids from the City of Crossville's Wastewater Treatment Facility.

The Contractor shall furnish all personnel, labor, equipment, trucks, and all other items necessary to remove the Bio-solids as specified and to perform all of the work for land application.

This Contract does hereby expressly incorporate same herein as fully as if set forth verbatim in this Contract:

The Instructions to Bidders

The General Specifications

All provisions of the Contract Documents shall be strictly complied with and conformed to by the Contractor, and no amendment to this Contract shall be made except upon the written consent of the parties, which consent shall not be unreasonably withheld. No amendment shall be construed to release either party from any obligation of the Contract Documents except as specifically provided for in such amendment.

This Contract is entered into subject to the following conditions:

a. The Contractor shall procure and keep in full force and effect throughout the term of this Contract all of the insurance policies specified in, and required by, the Contract Documents.

b. Neither the Contractor nor the City shall be liable for the failure to perform their duties if such failure is caused by a catastrophe, riot, war, governmental order or regulation, strike, fire, accident, act of God or other similar or different contingency beyond the reasonable control of the Contractor.

c. In the event that any provision or portion thereof of any Contract Document shall be found to be invalid or unenforceable, then such provision or portion thereof shall be reformed in accordance with the applicable laws. The invalidity or unenforceability of any provision or portion of any Contract Document shall not affect the validity or enforceability of any other provision or portion of the Contract Documents.

IN WITNESS WHEREOF, we, the contracting parties, by our duly authorized agents, hereto affix our signatures and seals at _____, _____, as of this day of _____, 201_ A.D.

CITY OF CROSSVILLE, TENNESSEE

A Municipal Corporation of
Cumberland County, Tennessee

By:

Mayor

City Clerk

SEAL OF THE CITY OF

CROSSVILLE, TENNESSEE

ATTEST:

Secretary

Contractor"

SEAL

STATE OF TENNESSEE
COUNTY OF CUMBERLAND

Before the undersigned, a Notary Public, in and for the State and
County aforesaid, personally appeared _____, with whom I am personally
acquainted, or whose identity was proven to me on the basis of satisfactory evidence, and
who, upon oath, acknowledged himself to be the Mayor of the City of Crossville, a
municipal corporation, one of the within named bargainers, and that he, as such official,

being duly authorized to do so, executed the foregoing instrument for the purposes therein contained, by signing the name of The City of Crossville by himself as Mayor.

IN WITNESS WHEREOF, I have hereunto set my hand and official Seal, at office, in said State and County, this the ____ Day of , 201__.

Notary Public

My commission expires:

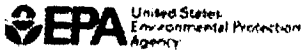
STATE OF TENNESSEE
COUNTY OF CUMBERLAND

Before the undersigned, a Notary Public, in and for the State and County aforesaid, personally appeared _____, with whom I am personally acquainted, or whose identity was proven to me on the basis of satisfactory evidence, and who, upon oath, acknowledged himself to be , one of the within named bargainers, and that he, as such official, being duly authorized to do so, executed the foregoing instrument for the purposes therein contained, by signing _____ by himself.

IN WITNESS WHEREOF, I have hereunto set my hand and official Seal, at office, in said State and County, this the ____ Day of , 201__.

Notary Public

My commission expires:



Water: Sewage Sludge (Biosolids)

You are here: [Water](#) » [Pollution Prevention & Control](#) » [Wastewater Programs](#) » [Treatment](#) » [Sewage Sludge \(Biosolids\)](#) » [Frequently Asked Questions](#)

Frequently Asked Questions

1) What are Biosolids?

They are nutrient-rich organic materials resulting from the treatment of domestic sewage in a treatment facility. When treated and processed, these residuals can be recycled and applied as fertilizer to improve and maintain productive soils and stimulate plant growth.

2) What is the difference between biosolids and sludge?

Biosolids are treated sewage sludge. Biosolids are carefully treated and monitored and must be used in accordance with regulatory requirements.

3) Why do we have biosolids?

We have biosolids as a result of the wastewater treatment process. Water treatment technology has made our water safer for recreation and seafood harvesting. Thirty years ago, thousands of American cities dumped their raw sewage directly into the nation's rivers, lakes, and bays. Through regulation of this dumping, local governments now required to treat wastewater and to make the decision whether to recycle biosolids as fertilizer, incinerate it, or bury it in a landfill.

4) How are biosolids generated and processed?

Biosolids are created through the treatment of domestic wastewater generated from sewage treatment facilities. The treatment of biosolids can actually begin before the wastewater reaches the sewage treatment plant. In many larger wastewater treatment systems, pre-treatment regulations require that industrial facilities pre-treat their wastewater to remove many hazardous contaminants before it is sent to a wastewater treatment plant. Wastewater treatment facilities monitor incoming wastewater streams to ensure their recyclability and compatibility with the treatment plant process.

Once the wastewater reaches the plant, the sewage goes through physical, chemical and biological processes which clean the wastewater and remove the solids. If necessary, the solids are then treated with lime to raise the pH level to eliminate objectionable odors. The wastewater treatment processes sanitize wastewater solids to control pathogens (disease-causing organisms, such as certain bacteria, viruses and parasites) and other organisms capable of transporting disease.

5) How are biosolids used?

After treatment and processing, biosolids can be recycled and applied as fertilizer to improve and maintain productive soils and stimulate plant growth. The controlled land application of biosolids completes a natural cycle in the environment. By treating sewage sludge, it becomes biosolids which can be used as valuable fertilizer, instead of taking up space in a landfill or other disposal facility.

6) Where are biosolids used?

Farmers and gardeners have been recycling biosolids for ages. Biosolids recycling is the process of beneficially using treated the treated residuals from wastewater treatment to promote the growth of agricultural crops, fertilize gardens and parks and reclaim mining sites. Land application of biosolids takes place in all 50 states.

7) Why are biosolids used on farms?

The application of biosolids reduces the need for chemical fertilizers. As more wastewater plants become capable of producing high quality biosolids, there is an even greater opportunity to make use of this valuable resource.

8) What percentage of biosolids are recycled and how many farms use biosolids?

About 50% of all biosolids are being recycled to land. These biosolids are used on less than one percent of the nation's agricultural land.

9) Are biosolids safe?

The National Academy of Sciences has reviewed current practices, public health concerns and regulator standards, and has concluded that "the use of these materials in the production of crops for human consumption when practiced in accordance with existing federal guidelines and regulations, presents negligible risk to the consumer, to crop production and to the environment."

10) Do biosolids smell?

Biosolids may have their own distinctive odor depending on the type of treatment it has been through. Some biosolids may have only a slight musty, ammonia odor. Others have a stronger odor that may be offensive to some people. Much of the odor is caused by compounds containing sulfur and ammonia, both of which are plant nutrients.

11) Are there regulations for the land application of biosolids?

The federal biosolids rule is contained in 40 CFR Part 503. Biosolids that are to be land applied must meet these strict regulations and quality standards. The Part 503 rule governing the use and disposal of biosolids contain numerical limits, for metals in biosolids, pathogen reduction standards, site restriction, crop harvesting restrictions and monitoring, record keeping and reporting requirements for land applied biosolids as well as similar requirements for biosolids that are surface disposed or incinerated. Most recently, standards have been proposed to include requirements in the Part 503 Rule that limit the concentration of dioxin and dioxin like compounds in biosolids to ensure safe land application.

12) Where can I find out more about the regulations?

The biosolids rule is described in the EPA publication, [A Plain English Guide to the EPA Part 503 Biosolids Rule](#). This guide states and interprets the Part 503 rule for the general reader. This guide is also available in hard copy. In addition to the Plain English Guide, EPA has prepared [A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule](#) which shows the many steps followed to develop the scientifically defensible, safe set of rules (also available from EPA in hard copy.)

13) How are biosolids used for agriculture?

Biosolids are used to fertilize fields for raising crops. Agricultural use of biosolids, that meet strict quality criteria and application rates, have been shown to produce significant improvements in crop growth and yield. Nutrients found in biosolids, such as nitrogen, phosphorus and potassium and trace elements such as calcium, copper, iron, magnesium, manganese, sulfur and zinc, are necessary for crop production and growth. The use of biosolids reduces the farmer's production costs and replenishes the organic matter that has been depleted over time. The organic matter improves soil structure by increasing the soil's ability to absorb and store moisture.

The organic nitrogen and phosphorous found in biosolids are used very efficiently by crops because these plant nutrients are released slowly throughout the growing season. This enables the crop to absorb these nutrients as the crop grows. This efficiency lessens the likelihood of groundwater pollution of nitrogen and phosphorous.

14) Can biosolids be used for mine reclamation?

Biosolids have been used successfully at mine sites to establish sustainable vegetation. Not only does the organic matter, inorganic matrix and nutrients present in the biosolids reduce the bioavailability of toxic substances often found in highly disturbed mine soils, but also regenerate the soil layer. This regeneration is very important for reclaiming abandoned mine sites with little or no topsoil. The biosolids application rate for mine reclamation is generally higher than the agronomic rate which cannot be exceeded for use of agricultural soils.

15) How are biosolids used for forestry?

<http://water.epa.gov/polwaste/wastewater/treatment/biosolids/genqa.cfm>

Biosolids have been found to promote rapid timber growth, allowing quicker and more efficient harvest of an important natural resource.

16) Can biosolids be used for composting?

Yes, biosolids may be composted and sold or distributed for use on lawns and home gardens. Most biosolids composts, are highly desirable products that are easy to store, transport and use.

17) Are there rules about where biosolids can be applied?

To determine whether biosolids can be applied to a particular farm site, an evaluation of the site's suitability is generally performed by the land applier. The evaluation examines water supplies, soil characteristics, slopes, vegetation, crop needs and the distances to surface and groundwater.

There are different rules for different classes of biosolids. Class A biosolids contain no detectible levels of pathogens. Class A biosolids that meet strict vector attraction reduction requirements and low levels metals contents, only have to apply for permits to ensure that these very tough standards have been met. Class B biosolids are treated but still contain detectible levels of pathogens. There are buffer requirements, public access, and crop harvesting restrictions for virtually all forms of Class B biosolids.

Nutrient management planning ensures that the appropriate quantity and quality of biosolids are land applied to the farmland. The biosolids application is specifically calculated to match the nutrient uptake requirements of the particular crop. Nutrient management technicians work with the farm community to assure proper land application and nutrient control.

18) Are there buffer requirements or restrictions on public access to sites with biosolids?

In general, exceptional quality (Class A) biosolids used in small quantities by general public have no buffer requirements, crop type, crop harvesting or site access restrictions. Exceptional Quality biosolids is the name given to treated residuals that contain low levels of metals and do not attract vectors. When used in bulk, Class A biosolids are subject to buffer requirements, but not to crop harvesting restrictions. In general, there are buffer requirements, public access, and crop harvesting restrictions for virtually all forms of Class B biosolids (treated but still containing detectible levels of pathogens).

19) Can anyone apply biosolids to land?

Anyone who wants to use biosolids for land application must comply with all relevant federal and state regulations. In some cases a permit may be required.

20) What will it mean for a wastewater treatment plant, biosolids manager or land applier to agree to follow an Environmental Management System (EMS) for Biosolids?

A voluntary EMS is now being developed for biosolids by the National Biosolids Partnership (NBP). The NBP consists of members from the Association of Metropolitan Sewerage Agency, the Water Environment Federation, the U.S. Environmental Protection Agency (EPA) and other stakeholders including the general public. Those facilities who pledge to follow the EMS are agreeing to follow community-friendly practices in addition to being in compliance with applicable state and Federal regulations. Community friendly practices refer to the control of odor, traffic, noise, and dust as well as the management of nutrients. Those who pledge to follow the EMS will be subjected to audit by impartial independent third parties.

Last updated on Friday, September 14, 2012

**RULES
OF THE
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES**

**CHAPTER 0400-40-15
BIOSOLIDS MANAGEMENT**

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0400-40-15-.01 GENERAL PROVISIONS [40 CFR 503 SUBPART A].

(1) Purpose and Applicability [40 CFR 503.1]

(a) Purpose

1. These rules establish standards, which consist of general requirements, contaminant limits, management practices, and operational standards, for the land application of biosolids generated during the treatment of domestic sewage in a wastewater treatment works. Standards are included in these rules for biosolids applied to the land. Also included in these rules are pathogen and alternative vector attraction reduction requirements for biosolids applied to the land.
2. In addition, the standards in these rules include the frequency of monitoring and recordkeeping requirements when biosolids are applied to the land. Also included in these rules are reporting requirements for generators who apply biosolids.

(b) Applicability

These rules apply to any person who applies biosolids to the land, to biosolids applied to the land, and to land where biosolids are applied; provided, however that EQ biosolids are exempt from all requirements of these rules, other than the requirement that the facility that prepares EQ biosolids document in its annual report the information contained in subparagraph (7)(a) of Rule 0400-40-15-.02 documenting that they meet the criteria for EQ biosolids.

(2) Permits and Direct Enforceability [40 CFR 503.3]

- (a) Permits. The requirements in these rules may be implemented through a permit issued under T.C.A. § 69-3-101 et seq.
- (b) Direct enforceability. No person shall use biosolids through any practice for which requirements are established in these rules except in accordance with such requirements.

(3) Relationship to other regulations [40 CFR 503.4]

Disposal of sewage sludge in a solid waste landfill unit, as defined in Rule 0400-11-01-.01(2), that complies with the requirements in Chapter 0400-11-01 constitutes compliance with these

(Rule 0400-40-15-.01, continued)

rules. Any person who prepares sewage sludge that is disposed of in a solid waste landfill unit shall ensure that the sewage sludge meets the requirements in Chapter 0400-11-01 concerning the quality of materials disposed of in a solid waste landfill unit.

(4) Additional or more stringent requirements [40 CFR 503.5]

On a case-by-case basis, the Director may impose requirements for the application of biosolids in addition to or more stringent than the requirements in these rules when necessary to protect public health or the environment from any reasonably anticipated adverse effect that may occur due to any characteristic of the biosolids or the site.

(5) Exclusions [40 CFR 503.6]

- (a) Treatment processes. These rules do not establish requirements for processes used to treat domestic sewage or for processes used to treat sewage sludge or biosolids prior to final application or disposal, except as provided in paragraphs (3) and (4) of Rule 0400-40-15-.04.
- (b) Selection of an application practice. These rules do not require the selection of a biosolids application. The determination of the manner in which biosolids are used is a local determination.
- (c) Sludge generated at an industrial facility. These rules do not establish requirements for the use or disposal of sludge generated at an industrial facility during the treatment of industrial wastewater, including sewage sludge or biosolids generated during the treatment of industrial wastewater combined with domestic sewage.
- (d) Hazardous sewage sludge or biosolids. These rules do not establish requirements for the land application of biosolids determined to be hazardous in accordance with 40 CFR part 261. Biosolids that are to be land applied shall be tested using EPA Publication SW-846 to determine whether the biosolids leaching potential is greater than the Toxicity Characteristic (TC) levels specified in 40 CFR 261.24. If any of the TC levels specified in 40 CFR 261.24 are exceeded, the biosolids shall not be land applied.
- (e) Biosolids or sewage sludge with high PCB concentration. These rules do not establish requirements for the land application of biosolids with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry weight basis).
- (f) Grit and screenings. These rules do not establish requirements for the use or disposal of grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings (e.g., relatively large materials such as rags) generated during preliminary treatment of domestic sewage in a treatment works.
- (g) Drinking water treatment sludge. These rules do not establish requirements for the use or disposal of sludge generated during the treatment of either surface water or ground water used for drinking water.
- (h) Domestic, commercial and industrial septage. These rules do not establish requirements for the use or disposal of domestic septage, commercial septage, industrial septage, a mixture of domestic septage and commercial septage, or a mixture of domestic septage and industrial septage.

(6) Requirement for a person who prepares biosolids [40 CFR 503.7]

(Rule 0400-40-15-.01, continued)

Any person who prepares biosolids shall ensure that the applicable requirements in these rules are met when the biosolids are applied to the land and that biosolids that do not meet the requirements of these rules are not applied to the land.

- (7) Sampling and analysis [40 CFR 503.8]
- (a) Sampling. Representative samples of biosolids that are applied to the land shall be collected and analyzed.
 - (b) Methods. Analyses of samples shall be accomplished in accordance with the methods most recently approved by USEPA, a copy of which can be obtained from the Division of Water Resources.

- (8) General definitions. [40 CFR 503.9] The following definitions apply to the use of the terms in these rules.

The "Agronomic rate" is the lesser of the whole biosolids application rate (dry weight basis) designed in accordance with subparagraph (4)(d) of Rule 0400-40-15-.02:

- (a) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and
- (b) To minimize the amount of nitrogen in the biosolids that passes below the root zone of the crop or vegetation grown on the land to the ground water.

"Annual contaminant loading rate" is the maximum amount of a contaminant that can be applied to a unit area of land during any calendar year. The units may be in terms of "pounds per acre," "kilograms per hectare," etc. (i.e., weight per unit area)

"Annual whole biosolids application rate" is the maximum amount of biosolids (dry weight basis) that can be applied to a unit area of land during any calendar year.

"Active sinkhole" is one with fresh exposure, sloughing of soil into the sinkhole throat, wilted or leaning vegetation around the sinkhole, or an open surface hole measuring three feet deep or deeper.

"Agricultural land" is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

"Apply biosolids" or "biosolids applied to the land" means land application of biosolids.

"Base flood" is a flood that has a one percent chance of occurring in any given year (i.e., a flood with a magnitude equaled once in 100 years).

"Beneficial use of biosolids" means the application of biosolids to the land for the purposes of improving soil characteristics including tilth, fertility, and stability to enhance the growth of vegetation consistent with protecting human health and the environment.

"Biosolids" are treated sewage sludge that have contaminant concentrations less than or equal to the contaminant concentrations listed in Table 1 of subparagraph (3)(b) of Rule 0400-40-15-.02, meet any one of the ten vector attraction reduction options listed in part (4)(b)1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of Rule 0400-40-15-.04, and meet either one of the six pathogen reduction alternatives for Class A listed in part (3)(a)3, 4, 5, 6, 7, or 8, or one of the three pathogen reduction alternatives for Class B listed in part (3)(b)2, 3, or 4 of Rule 0400-40-15-.04.

(Rule 0400-40-15-.01, continued)

"Bulk biosolids" means biosolids that are not sold or given away in a bag or other container for application to the land (i.e., biosolids that are not put in packages, bags, or other containers for sale but are sold, given away, applied to the land, or disposed of in larger quantities).

"Ceiling concentration" means the maximum concentration of a contaminant in any biosolids sample, beyond which level the biosolids would be classified as sewage sludge not suitable for application to the land. Ceiling concentrations are established in Table 1 of 0400-40-15-.02(3)(b).

"Commissioner" means the Commissioner of the Tennessee Department of Environment and Conservation.

"Composting" means the biological degradation of organic material under controlled conditions designed to promote aerobic decomposition. This does not include the treatment of sewage sludge in a digester at a wastewater treatment plant.

"Contaminant" means an organic substance, an inorganic substance, or a combination of organic and inorganic substances that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could, based upon information available to the Commissioner, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms, depending upon the concentration.

"Contaminant limit" is a numerical value that describes the amount of a contaminant allowed per unit amount of biosolids (e.g., milligrams per kilogram of total solids); the amount of a contaminant that can be applied to a unit area of land (e.g., kilograms per hectare); or the volume of a material that can be applied to a unit area of land (e.g., gallons per acre).

"Cover crop" is a quick growing crop planted between periods of regular crop production to prevent soil erosion and provide humus or nitrogen.

"Cumulative contaminant loading rate" is the maximum amount of a contaminant that can be applied to an area of land from biosolids that exceed the contaminant concentration limits established in Table 3 of 0400-40-15-.02(3)(b).

"CWA" means the Clean Water Act (formerly referred to as either the Federal Water Pollution Act or the Federal Water Pollution Control Act Amendments of 1972), Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, Public Law 97-117, and Public Law 100-4.

"Department" means the Department of Environment and Conservation for the State of Tennessee.

"Director" means the director of the Division of Water Resources or his or her authorized representative.

"Division" means the Division of Water Resources.

"Domestic septage" is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater nor does it include grease removed from a grease trap at a restaurant.

(Rule 0400-40-15-.01, continued)

"Domestic sewage" is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

"Dry weight basis" means calculated on the basis of having been dried at 105° Celsius until reaching a constant mass (i.e., essentially 100 percent solids content).

"EPA" means the United States Environmental Protection Agency.

"Exceptional Quality Biosolids" or "EQ biosolids" are biosolids that meet the ceiling concentrations in Table 1 of subparagraph (3)(b) of Rule 0400-40-15-.02 and the contaminant concentrations in Table 3 of subparagraph (3)(b) of Rule 0400-40-15-.02; the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04; and one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04.

"Facility" means a treatment works treating domestic sewage as defined in this chapter, unless the context of the rule requires otherwise. For the purposes of this chapter a facility is considered to be new if it has not been previously approved for the treatment, storage, application, or disposal of biosolids.

"Feed crops" are crops produced primarily for consumption by animals.

"Fiber crops" are crops such as flax and cotton.

"Flood plain" is the nearly level plain that borders a stream and is subject to inundation under flood-stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of the stream.

"Food crops" are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

"Forest" is an area of land that is managed for the production of timber or other forest products, or for benefits such as recreation and watershed protection, and that is or will be dominated by trees under the current system of management.

"General permit" means a permit issued by the Division in accordance with the procedures established in this chapter that authorizes the application of biosolids to the land under which multiple treatment works treating domestic sewage may apply for coverage.

"Geometric mean" means the antilogarithm of the arithmetic average of the logarithms of the sample values, or the n^{th} root of the product of n sample values.

"Ground water" is water below the land surface in the saturated zone.

"Individual permit" means a permit issued by the Division to a single treatment works treating domestic sewage in accordance with this chapter, which authorizes the management of biosolids.

"Industrial wastewater" is wastewater generated in a commercial or industrial process.

"Land application" is the application of biosolids to the land surface by means such as spreading or spraying, the injection of biosolids below the land surface, or the incorporation of biosolids into the soil for the purpose of beneficial use.

"Material derived from biosolids" means biosolids to which any substance has been added.

(Rule 0400-40-15-.01, continued)

"Material derived from sewage sludge" is sewage sludge to which any substance has been added.

"Monthly average" is the arithmetic mean of all measurements taken during the month.

"Municipality" means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal Agency of two or more of the foregoing entities) created by or under State law or a designated and approved management Agency under section 208 of the CWA, as amended. The definition includes a special district created under State law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201(e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use, application, or disposal of biosolids and sewage sludge.

"Other container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of 1 metric ton (1.1 U.S. tons) or less.

"Owner" means any person with ownership interest in a site or facility or who exercises control over a site or facility.

"Pasture" is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

"Permit" means an authorization, license, or equivalent control document issued by the Division to implement the requirements of this chapter. Unless the context requires differently, the use of the term in this chapter refers to individual permits, general permits, and coverage under general permits.

"Person" is an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

"Person who prepares biosolids" is either the person who generates biosolids during the treatment of domestic sewage in a treatment works or the person who derives a material from biosolids.

"Public contact site" is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

"Publicly owned treatment works" or "POTW" means a treatment works treating domestic sewage that is owned by a municipality, public utility, the State of Tennessee, or the federal government.

"Range land" is generally open, uncultivated land dominated by herbaceous or shrubby vegetation that may be used for grazing or browsing, either by wildlife or livestock.

"Reclamation site" is drastically disturbed land that is reclaimed using biosolids. This includes, but is not limited to, strip mines and construction sites.

"Residential equivalent value" means the number of residential equivalents determined for a facility under chapter.

(Rule 0400-40-15-.01, continued)

"Restrict public access" means to minimize access of nonessential personnel to land where biosolids are applied through the use of natural or artificial barriers, signs, remoteness, or other means.

"Runoff" is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off of the land surface.

"Sewage sludge" is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

"Site" means all areas of land, including buffer areas, which are identified in the scope of an approved site specific land application plan. A site is considered to be new or expanded when biosolids are applied to an area not approved in a site specific land application plan or that was not previously disclosed during a required public notice process.

"State" is the State of Tennessee

"State Biosolids Coordinator" is the person designated by the Commissioner to be responsible for the State of Tennessee's biosolids program.

"Stover" is the non-grain, above-ground part of a grain crop, often corn or sorghum.

"Surface impoundment" means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), and which is designed to hold an accumulation of liquids or sludges. The term includes holding, storage, settling, and aeration pits, ponds, or lagoons, but does not include injection wells.

"Tank" means a stationary device designed to contain an accumulation of liquid or semisolid materials and which is constructed primarily of non-earthen materials to provide structural support.

"Toxicity characteristic leaching procedure (TCLP)" is the test method, Method 1311 (1992 or latest version) of Test Methods for Evaluating Solid Wastes (EPA Publication SW-846), Volume IC: Laboratory Manual, Physical/Chemical Methods), used to determine the mobility of both organic and inorganic contaminants present in liquid, solid, and multiphase wastes.

"Treat" or "treatment of sewage sludge or biosolids" is the preparation of sewage sludge or biosolids for final land application. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge or biosolids. This does not include storage of either sewage sludge or biosolids.

"Treatment works" is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

"Treatment works treating domestic sewage" means a publicly owned treatment works or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, sewage sludge, or biosolids, including land dedicated for the disposal of sewage sludge or biosolids.

(Rule 0400-40-15-.01, continued)

"Waters of the State" are any and all waters, public or private, on or beneath the surface of the ground, that are contained within, flow through, or border upon Tennessee or any portion thereof, except those bodies of water confined to and retained within the limits of private property in single ownership that do not combine or effect a junction with natural surface or underground waters.

"Well drained soil" is a soil drainage class characterized by the lack of any evidence of the seasonal high water table in the top 36 inches of the soil profile.

"Wetlands" means those areas that are inundated or saturated by surface water or ground water at a frequency and duration 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.

(9) Rule Structure

These rules are organized, numbered, and referenced according to the following outline form:

(1) paragraph

(a) subparagraph

1. part

(i) subpart

(l) item

I. subitem

A. section

(A) subsection

Authority: T.C.A. §§ 69-3-101 et seq. and 4-5-201 et seq. **Administrative History:** Original rule filed April 1, 2013; effective June 30, 2013.

0400-40-15-.02 LAND APPLICATION [40 CFR 503 SUBPART B].

(1) Applicability [40 CFR 503.10]

- (a) This rule applies to any person who applies biosolids to the land, to biosolids applied to the land, and to the land on which biosolids are applied.
- (b) No person shall apply biosolids to the land except in accordance with the requirements in this chapter.

(2) General requirements [40 CFR 503.12]

- (a) No person shall apply bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative contaminant loading rates in part (3)(b)2 of this rule has been reached.

(Rule 0400-40-15-.02, continued)

- (b) The person who prepares bulk biosolids that are applied to agricultural land, forest, a public contact site, or a reclamation site shall provide the person who applies the bulk biosolids written notification of the concentration of total nitrogen (including total kjekdahl nitrogen [TKN], ammonia nitrogen, and nitrate-nitrogen) as N on a dry weight basis in the bulk biosolids.
- (c)
 - 1. The person who applies biosolids to the land shall obtain information needed to comply with the requirements in this rule.
 - 2.
 - (i) Before bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule are applied to the land, the person who proposes to apply the bulk biosolids shall contact EPA Region 4 to determine whether bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule have been applied to the site since July 20, 1993.
 - (ii) If bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule have not been applied to the site since July 20, 1993, the cumulative amount for each contaminant listed in Table 2 of subparagraph (3)(b) of this rule may be applied to the site in accordance with subpart (3)(a)2(i) of this rule.
 - (iii) If bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule have been applied to the site since July 20, 1993, and the cumulative amount of each contaminant applied to the site in the bulk biosolids since that date is known, the cumulative amount of each contaminant applied to the site shall be used to determine the additional amount of each contaminant that can be applied to the site in accordance with subpart (3)(a)2(i) of this rule.
 - (iv) If bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule have been applied to the site since July 20, 1993, and the cumulative amount of each contaminant applied to the site in the bulk biosolids since that date is not known, an additional amount of each contaminant shall not be applied to the site in accordance with subpart (3)(a)2(i) of this rule.
- (d) When a person who prepares bulk biosolids provides the bulk biosolids to a person who applies the bulk biosolids to the land, the person who prepares the bulk biosolids shall provide the person who applies the biosolids notice and necessary information (NANI) to comply with the requirements in this chapter.
- (e) When a person who prepares sewage sludge provides the sewage sludge to another person who prepares the sewage sludge, the person who provides the sewage sludge shall provide the person who receives the sewage sludge notice and necessary information (NANI) to comply with the requirements in this chapter.
- (f) The person who applies bulk biosolids to the land shall provide the owner or lease holder of the land on which the bulk biosolids are applied notice and necessary information (NANI) to comply with the requirements in this chapter.
- (g) Any person who prepares bulk biosolids that are applied to land in a State other than the State of Tennessee shall provide written notice, prior to the initial application of bulk biosolids to the land application site by the applier, to EPA Region 4. The notice shall include:

(Rule 0400-40-15-.02, continued)

1. The location, by either street address or latitude and longitude, of each land application site;
 2. The approximate time period bulk biosolids will be applied to the site;
 3. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who prepares the bulk biosolids; and
 4. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) for the person who will apply the bulk biosolids.
- (h) Any person who applies bulk biosolids subject to the cumulative contaminant loading rates in part (3)(b)2 of this rule to the land shall provide written notice, prior to the initial application of bulk biosolids to a land application site by the applier, to EPA Region 4. The notice shall include:
1. The location, by either street address or latitude and longitude, of the land application site; and
 2. The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) of the person who will apply the bulk biosolids.
- (3) Contaminant limits [40 CFR 503.13]
- (a) Biosolids.
1. Bulk biosolids or biosolids sold or given away in a bag or other container shall not be applied to the land if the concentration of any contaminant in the biosolids exceeds the ceiling concentration for the contaminant in Table 1 of subparagraph (b) of this paragraph.
 2. If bulk biosolids is applied to agricultural land, forest, a public contact site, or a reclamation site, either:
 - (i) The cumulative loading rate for each contaminant shall not exceed the cumulative contaminant loading rate for the contaminant in Table 2 of subparagraph (b) of this paragraph; or
 - (ii) The concentration of each contaminant in the biosolids shall not exceed the monthly average concentration for the contaminant in Table 3 of subparagraph (b) of this paragraph.
 3. If bulk biosolids are applied to a lawn or a home garden, the concentration of each contaminant in the biosolids shall not exceed the ceiling concentration for the contaminant in Table 1 or the monthly average concentration in Table 3 of subparagraph (b) of this paragraph.
 4. If biosolids are sold or given away in a bag or other container for application to the land, the concentration of each contaminant in the biosolids shall not exceed the ceiling concentration for the contaminant in Table 1 or the monthly average concentration in Table 3 of subparagraph (b) of this paragraph.
- (b) Biosolids contaminant concentrations and loading rates.

(Rule 0400-40-15-.02, continued)

1. Ceiling Concentrations

Table 1
Ceiling Concentrations

Contaminant	Ceiling Concentration (milligrams per kilogram) ^{1,2}
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7500

¹Dry weight basis

²These amounts are a maximum level never to be exceeded

2. Cumulative Contaminant Loading Rates.

Table 2
Cumulative Contaminant Loading Rates

Contaminant	Cumulative Contaminant Loading Rate (kilograms per hectare)
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2800

3. Contaminant Concentrations

Table 3
Contaminant Concentrations

Contaminant	Monthly average concentration (milligrams per kilogram) ¹
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2800

¹Dry weight basis

(4) Management practices [40 CFR 503.14]

(Rule 0400-40-15-.02, continued)

- (a) Bulk biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under section 4 of the Endangered Species Act or its designated critical habitat.
- (b) Bulk biosolids shall not be applied to agricultural land, forest, a public contact site, or a reclamation site that is flooded, frozen, or snow-covered so that the bulk biosolids enters a wetland or other waters of State of Tennessee, except as provided in a permit issued pursuant to § 402 or 404 of the Clean Water Act.
- (c) Bulk biosolids shall not be applied to agricultural land, forest, or a reclamation site unless all of the following setbacks are met:
 - 1. 100 feet or more from surface waters of the State of Tennessee which are positioned down gradient of the application site.
 - 2. 33 feet or more from surface waters of the State of Tennessee which are positioned up gradient for the application site.
 - 3. 100 feet from all wells.
 - 4. 100 feet from all water supply reservoirs.
 - 5. 100 feet from active sinkholes.
- (d) Bulk biosolids shall be applied to agricultural land, forest, a public contact site, or a reclamation site at a whole biosolids application rate that is equal to or less than the agronomic rate for the bulk biosolids, unless, in the case of a reclamation site, otherwise specified by EPA Region 4 and the Director. In order for a rate greater than the agronomic rate to be used, EPA Region 4 must approve the rate and that rate or a lesser rate shall be approved by the State Biosolids Coordinator for all land applied biosolids in the State of Tennessee. For the purposes of determining the agronomic rate, the person applying biosolids shall comply with all five of the following parts.
 - 1. Determine crop yields and crop nitrogen (N) requirements based upon a recommendation of the farmer, a written recommendation from the University of Tennessee Extension, historical site yield data, or estimated average yields for the specified crops within the County in which the application site is situated. The average of the actual yields documented from the best three years during a 5-year cycle is typical and is recommended.
 - 2. The following Mineralization Rates shall be used as default values in calculating the agronomic rate:

Unstabilized Primary and Secondary Sewage Sludge	40%
Alkaline Stabilized Sewage Sludge	30%
Aerobically Digested Sewage Sludge	30%
Anaerobically Digested Sewage Sludge	20%
Composted Sewage Sludge	10%

These default values shall be used unless actual mineralization rates have been established with proper documentation and approved by the State Biosolids Coordinator.

(Rule 0400-40-15-.02, continued)

3. Crop nitrogen requirements shall follow Table 1 below:

Table 1 – Crop Nitrogen Requirements

CROP	EXPECTED YIELD	NITROGEN REQUIREMENT (lbs N per Acre per Year)
Corn (grain)	100-125 bu/ac	120
	125-150 bu/ac	150
Corn (silage)	20 tons/ac	120-150
Bermuda grass	5-10 tons/ac	200
Soybeans(1)	30 bu/ac	100
	40 bu/ac	150
	50 bu/ac	190
Wheat	40 bu/ac	60
Summer Annual Grass	6 tons (1 cutting)*	60-120
Hybrid Hay	8 tons (4 cuttings)*	400(2)
Tall Fescue Hay	3 tons (2 cuttings)*	120
Orchard Grass Hay	4 tons (2 cuttings)*	60-120
Sorghum (grain)	60 bu/ac	60
Cotton	1 bale/ac	50
	1.5 bales/ac	90
Other (3)	(3)	(3)

*When less than the indicated number of harvests is expected, the total nitrogen rate shall be reduced proportionally.

(1) Soybeans are a legume and can obtain 50% to 60% of their nitrogen needs from atmospheric nitrogen. The acceptable "nitrogen requirement" will vary and shall be approved by the State Biosolids Coordinator.

(2) Highly dependent on field conditions and harvesting schedule.

(3) Any recommendation from the University of Tennessee Extension and/or approved by the State Biosolids Coordinator.

4. Follow procedures for determining plant available nitrogen (PAN) as described in paragraph (12) Appendix .02-A of this rule and apply the whole biosolids application rate that provides no more than the amount of nitrogen required by the crop or crops to be grown unless otherwise specified by the State Biosolids Coordinator.
5. In cases where the biosolids have substantial liming value, the agronomic rate shall be the lesser of the whole biosolids application rate that provides crop nitrogen needs as determined by parts 1 and 2 of this subparagraph or required liming equivalent necessary to raise the soil pH to the value most conducive for productivity of the crop(s) to be grown. Since moderately alkaline soil ranges from 7.9 to 8.4, the upper limit for soil pH is 8.4.

- (e) Either a label shall be affixed to the bag or other container containing biosolids that are sold or given away for application to the land or an information sheet shall be provided to the person who receives biosolids sold or given away in another container for application to the land. The label or information sheet shall contain the following information:

(Rule 0400-40-15-.02, continued)

1. The name and address of the person who prepared the biosolids that are sold or given away in a bag or other container for application to the land.
 2. A statement that application of the biosolids to the land is prohibited except in accordance with the instructions on the label or information sheet.
- (5) Operational standards—pathogens and vector attraction reduction [40 CFR 503.15]
- (a) Pathogens.
1. The Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 or the Class B pathogen requirements and site restrictions in subparagraph (3)(b) of Rule 0400-40-15-.04 shall be met when bulk biosolids are applied to agricultural land, forest, a public contact site, or a reclamation site.
 2. The Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 shall be met when bulk biosolids are applied to a lawn or a home garden.
 3. The Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 shall be met when biosolids are sold or given away in a bag or other container for application to the land.
- (b) Vector attraction reduction.
1. One of the vector attraction reduction requirements in parts (4)(b)1 through 10 of Rule 0400-40-15-.04 shall be met when bulk biosolids are applied to agricultural land, forest, a public contact site, or a reclamation site.
 2. One of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 shall be met when bulk biosolids are applied to a lawn or a home garden.
 3. One of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 shall be met when biosolids are sold or given away in a bag or other container for application to the land.
- (6) Frequency of Monitoring [40 CFR 503.16]
- (a) Biosolids.
1. The frequency of monitoring for the contaminants listed in Table 1, Table 2, and Table 3 of subparagraph (3)(b) of this rule; the pathogen density requirements in subparagraph (3)(a) and part (3)(b)2 of Rule 0400-40-15-.04; and the vector attraction reduction requirements in parts (4)(b)1 through 4, 7, and 8 of Rule 0400-40-15-.04 shall be the frequency specified in Table 1 of this subparagraph for the amount of biosolids applied.

Table 1
Frequency of Monitoring—Land Application

Amount of Biosolids ¹ (metric tons per calendar year)	Frequency
Greater than zero but less than 290	Once per year

(Rule 0400-40-15-.02, continued)

Equal to or greater than 290 but less than 1,500	Once per quarter (4 times per year)
Equal to or greater than 1,500 but less than 15,000	Once per 60 days (6 times per year)
Equal to or greater than 15,000	Once per month (12 times per year)

¹Either the amount of bulk biosolids applied to the land or the amount of biosolids prepared for sale or give-away in a bag or other container for application to the land (dry weight basis).

2. After the biosolids have been monitored for two years at the frequency in Table 1 the monitoring frequency for contaminants and/or pathogen densities may be reduced by EPA. If EPA reduces the monitoring for contaminants and/or pathogen densities, the State of Tennessee will accept the revised monitoring frequency as stipulated by EPA.
 - (b) PCBs shall be monitored at least once every five years unless otherwise specified by the State Biosolids Coordinator.
 - (c) A Toxicity Characteristic Leaching Procedure (TCLP) using SW-846 Method 1311 in accordance with 40 CFR 261.24 shall be conducted at least once every five years unless otherwise specified by the State Biosolids Coordinator.

- (7) Recordkeeping [40 CFR 503.17]
 - (a) The person who prepares the biosolids shall develop the following information and shall retain the information for five years:
 1. The concentration of each contaminant listed in Table 3 of subparagraph (3)(b) of this rule in the biosolids;
 2. The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"
 3. A description of how the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 are met; and
 4. A description of how one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 is met.
 - (b) The person who prepares biosolids shall develop the following information and shall retain the information for five years.
 1. The concentration of each contaminant listed in Table 3 of subparagraph (3)(b) of this rule in the material;
 2. The following certification statement:

(Rule 0400-40-15-.02, continued)

- "I certify under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"
3. A description of how the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 are met; and
 4. A description of how one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 is met.
- (c) If the contaminant concentrations in part (3)(b)3 of this rule, the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04, and the vector attraction reduction requirements in either part (4)(b)9 or 10 of Rule 0400-40-15-.04 are met when bulk biosolids are applied to agricultural land, forest, a public contact site, or a reclamation site:
1. The person who prepares the bulk biosolids shall develop the following information and shall retain the information for five years:
 - (i) The concentration of each contaminant listed in Table 3 of subparagraph (3)(b) of this rule in the bulk biosolids;
 - (ii) The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;" and
 - (iii) A description of how the pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 are met.
 2. The person who applies the bulk biosolids shall develop the following information and shall retain the information for five years:
 - (i) The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in paragraph (4) of Rule 0400-40-15-.02 and the vector attraction reduction requirement in [insert either part (4)(b)9 or 10 of Rule 0400-40-15-.04] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"

(Rule 0400-40-15-.02, continued)

- (ii) A description of how the management practices in paragraph (4) of this rule are met for each site on which bulk biosolids are applied. This description shall include for each individual field or site on which biosolids were applied the following:
 - (I) A listing, including usable acres, for each field or site to which biosolids were applied;
 - (II) A listing of all loads of biosolids, including dry tons, applied to the field or site;
 - (III) An indication of the crop(s) to be grown after application, including projected yields and nitrogen requirements; and
 - (IV) Calculation of the dry tons per acre applied, the plant available nitrogen applied per acre, and a determination that the agronomic loading rate for nitrogen was met; and
 - (iii) A description of how the vector attraction reduction requirements in either part (4)(b)9 or 10 of Rule 0400-40-15-.04 are met for each site on which bulk biosolids are applied.
- (d) If the contaminant concentrations in part (3)(b)3 of this rule and the Class B pathogen requirements in subparagraph (3)(b) of Rule 0400-40-15-.04 are met when bulk biosolids are applied to agricultural land, forest, a public contact site, or a reclamation site:
1. The person who prepares the bulk biosolids shall develop the following information and shall retain the information for five years:
 - (i) The concentration of each contaminant listed in Table 3 of subparagraph (3)(b) of this rule in the bulk biosolids;
 - (ii) The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirements in subparagraph (3)(b) of Rule 0400-40-15-.04 and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"
 - (iii) A description of how the Class B pathogen requirements in subparagraph (3)(b) of Rule 0400-40-15-.04 are met; and
 - (iv) When one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 is met, a description of how the vector attraction reduction requirement is met.
 2. The person who applies the bulk biosolids shall develop the following information and shall retain the information for five years:

(Rule 0400-40-15-.02, continued)

- (i) The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in paragraph (4) of Rule 0400-40-15-.02, the site restrictions in part (3)(b)5 of Rule 0400-40-15-.04, and the vector attraction reduction requirement in [insert either part (4)(b)9 or 10 of Rule 0400-40-15-.04 if one of those requirements is met] was prepared for each site on which bulk biosolids are applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"
 - (ii) A description of how the management practices in paragraph (5) of this rule are met for each site on which bulk biosolids are applied. This description shall include, for each individual field or site on which biosolids were applied the following:
 - (I) A listing, including usable acres, for each field or site to which biosolids were applied;
 - (II) A listing of all loads of biosolids, including dry tons, applied to the field or site;
 - (III) An indication of the crop(s) to be grown after application, including projected yields and nitrogen requirements; and
 - (IV) Calculation of the dry tons per acre applied, the plant available nitrogen applied per acre, and a determination that the agronomic loading rate for nitrogen was met;
 - (iii) A description of how the site restrictions in part (3)(b)5 of Rule 0400-40-15-.04 are met for each site on which bulk biosolids are applied;
 - (iv) When the vector attraction reduction requirement in either part (4)(b)9 or 10 of Rule 0400-40-15-.04 is met, a description of how the vector attraction reduction requirement is met; and
 - (v) The date bulk biosolids are applied to each site.
- (e) If the requirements in subpart (3)(a)2(i) of this rule are met when bulk biosolids are applied to agricultural land, forest, a public contact site, or a reclamation site:
1. The person who prepares the bulk biosolids shall develop the following information and shall retain the information for five years:
 - (i) The concentration of each contaminant listed in Table 1 of subparagraph (3)(b) of this rule in the bulk biosolids;
 - (ii) The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert either subparagraph (3)(a) of Rule 0400-40-15-.04 or subparagraph (3)(b) of Rule 0400-40-15-.04] and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in parts (4)(b)1 through

(Rule 0400-40-15-.02, continued)

8 of Rule 0400-40-15-.04 if one of those requirements is met] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"

- (iii) A description of how the pathogen requirements in either subparagraph (3)(a) or (b) of Rule 0400-40-15-.04 are met; and
 - (iv) When one of the vector attraction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 is met, a description of how the vector attraction requirement is met.
2. The person who applies the bulk biosolids shall develop the following information, retain the information in subparts (i) through (vii) of this part indefinitely, and retain the information in subparts (viii) through (xiii) of this part for five years.
- (i) The location, by either street address or latitude and longitude, of each site on which bulk biosolids are applied.
 - (ii) The number of acres in each site on which bulk biosolids are applied.
 - (iii) The date bulk biosolids are applied to each site.
 - (iv) The cumulative amount of each contaminant (i.e., kilograms) listed in Table 2 of subparagraph (3)(b) of this rule in the bulk biosolids applied to each site, including the amount in subpart (2)(c)2(iii) of this rule.
 - (v) The amount of biosolids (i.e., tons) applied to each site.
 - (vi) The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the requirement to obtain information in part (2)(c)2 of Rule 0400-40-15-.02 was prepared for each site on which bulk biosolids were applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."
 - (vii) A description of how the requirements to obtain information in part (2)(c)2 of this rule are met.
 - (viii) The following certification statement:

"I certify, under penalty of law that the information that will be used to determine compliance with the management practices in paragraph (4) of Rule 0400-40-15-.02 was prepared for each site on which bulk biosolids were applied under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

(Rule 0400-40-15-.02, continued)

- (ix) A description of how the management practices in paragraph (4) of this rule are met for each site on which bulk biosolids are applied. This description shall include, for each individual field or site on which biosolids were applied the following:
 - (I) A listing, including usable acres, for each field or site to which biosolids were applied;
 - (II) A listing of all loads of biosolids, including dry tons, applied to the field or site;
 - (III) An indication of the crop(s) to be grown after application, including projected yields and nitrogen requirements; and
 - (IV) Calculation of the dry tons per acre applied, the plant available nitrogen applied per acre, and a determination that the agronomic loading rate for nitrogen was met.
- (x) The following certification statement when the bulk biosolids meet the Class B pathogen requirements in paragraph (3)(b) of Rule 0400-40-15-.04:

"I certify, under penalty of law, that the information that will be used to determine compliance with the site restrictions in part (3)(b)5 of Rule 0400-40-15-.04 for each site on which Class B biosolids were applied was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."
- (xi) A description of how the site restrictions in part (3)(b)5 of Rule 0400-40-15-.04 are met for each site on which Class B bulk biosolids are applied.
- (xii) The following certification statement when the vector attraction reduction requirement in either part (4)(b)9 or 10 of Rule 0400-40-15-.04 is met:

"I certify, under penalty of law, that the information that will be used to determine compliance with the vector attraction reduction requirement in [insert either part (4)(b)9 of Rule 0400-40-15-.04 or part (4)(b)10 of Rule 0400-40-15-.04] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."
- (xiii) If the vector attraction reduction requirements in either part (4)(b)9 or 10 of Rule 0400-40-15-.04 are met, a description of how the requirements are met.
- (f) If the requirements in part (3)(a)4 of this rule are met when biosolids are sold or given away in a bag or other container for application to the land, the person who prepares the biosolids that are sold or given away in a bag or other container shall develop the following information and shall retain the information for five years:
 1. The concentration of each contaminant listed in Table 1 and Table 3 of subparagraph (3)(b) of this rule in the biosolids;

(Rule 0400-40-15-.02, continued)

2. The following certification statement:

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practice in subparagraph (4)(e) of Rule 0400-40-15-.02, the Class A pathogen requirement in subparagraph (3)(a) of Rule 0400-40-15-.04, and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment;"

3. A description of how the Class A pathogen requirements in subparagraph (3)(a) of Rule 0400-40-15-.04 are met; and
4. A description of how one of the vector attraction requirements in parts (4)(b)1 through 8 of Rule 0400-40-15-.04 is met.

(8) Reporting [40 CFR 503.18]

- (a) All generators and preparers of biosolids shall submit the following information to the State Biosolids Coordinator:
 1. The information in paragraph (7) of this rule, except the information in parts (7)(c)2, (d)2 and (e)2 of this rule, for the appropriate requirements on February 19 of each year.
 2. The information in subparts (7)(e)2(i) through (vii) of this rule on February 19th of each year when 90 percent or more of any of the cumulative contaminant loading rates in Table 2 of subparagraph (3)(b) of this rule is reached at a land application site.
- (b) Annual reports shall be submitted in their entirety as an electronic [computer generated] file in one of the following formats: Microsoft Word (*.doc), Microsoft Excel (*.xls), Microsoft Snapshot (*.snp), or Adobe Portable Document Format (*.pdf). In order to establish the time and date of submission, the annual report should be sent as an attachment to an email to the State Biosolids Coordinator. The State Biosolids Coordinator will issue a waiver to the electronic submittal when it is demonstrated that the municipality does not have this capability.
- (c) Per application event or monthly (lesser of these two frequencies) a Farm Operator Report shall be provided to the grower showing sites, fields, year-to-date dry tons applied, amount of nutrients applied, and dates of application. This is not required if the generator is also the applier and/or the grower.
- (d) A form shall be included in the annual report submitted to the State Biosolids Coordinator which contains at a minimum:
 1. A summary of calendar year annual application activity, to include, for all sites, annual dry tons applied; and
 2. For each site, provide:
 - (i) Summary information:

(Rule 0400-40-15-.02, continued)

- (I) The applier;
- (II) Land owner or operator;
- (III) Latitude and longitude;
- (IV) County; and
- (V) Summary of overall site activity:
 - I. Approved acres;
 - II. Applied acres;
 - III. Total tonnage or volume (wet weight);
 - IV. Dry tons total; and
- (ii) Detailed information for each field:
 - (I) Field number/name;
 - (II) Field acres, excluding setbacks;
 - (III) Crop;
 - (IV) First application date;
 - (V) Last application date;
 - (VI) PAN applied (plant available nitrogen in pounds per acre);
 - (VII) Application method;
 - (VIII) Calculated application rate (DT/Ac) to meet crop PAN need;
 - (IX) Actual dry tons per acre;
 - (X) Actual per acre tonnage or volume (wet weight);
 - (XI) Total dry tons; and
 - (XII) Total tonnage or volume (wet weight)
- (9) Biosolids and Sewage Sludge Transportation Equipment – Transported on Public Roadways Only
 - (a) Liquid biosolids shall be transported in sealed, watertight containers.
 - (b) Tracking of biosolids or sewage sludge onto public roadways is prohibited.
 - (c) The Tennessee Department of Environment and Conservation, Division of Water Resources' nearest Environmental Field Office shall be notified by telephone of any spill within 24 hours of occurrence.
- (10) Reserved

(Rule 0400-40-15-.02, continued)

- (11) Reserved
- (12) Appendix .02-A – Example Agronomic Rate Calculation

Agronomic Loading Rate Calculation Sheet for Nitrogen

1. Biosolids Analysis:

CONSTITUENTS	mg/kg (Dry Weight)
TKN	39,500
Ammonia (N)	7,600
NO ₃ + NO ₂ (N)	5

- 2. Mineralization Rate (MR) = 20% (Anaerobically Digested Sewage Sludge) – See part (4)(d)2 of this rule.
- 3. Plant Available Nitrogen (PAN) = [(MR) x (TKN – NH₃)] + 0.5 x (NH₃) + (NO₃+NO₂)
 - (i) PAN = [(0.2) x (39,500 – 7,600)] + 0.5 x (7,600) + (5) = 10, 185 mg/kg PAN (mg/kg) x 0.002 = 20.37 lbs/dry ton
 - (ii) PAN = 20.37 lbs/dry ton or 5.09 lbs/wet ton (assuming 25% solids)

Authority: T.C.A. §§ 69-3-101 et seq. and 4-5-201 et seq. **Administrative History:** Original rule filed April 1, 2013; effective June 30, 2013.

0400-40-15-.03 RESERVED.

Authority: T.C.A. §§ 69-3-101 et seq. and 4-5-201 et seq. **Administrative History:** Original rule filed April 1, 2013; effective June 30, 2013.

0400-40-15-.04 PATHOGENS AND VECTOR ATTRACTION REDUCTION [40 CFR 503 SUBPART D]

- (1) Scope [40 CFR 503.30]
 - (a) This rule contains the requirements for biosolids and sewage sludge to be classified either Class A or Class B with respect to pathogens.
 - (b) This rule contains the site restrictions for land on which Class B biosolids are applied.
 - (c) This rule contains alternative vector attraction reduction requirements for biosolids that are applied to the land.

(2) Special definitions [40 CFR 503.31]

“Aerobic digestion” is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

“Anaerobic digestion” is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

“Density of microorganisms” is the number of microorganisms per unit mass of total solids (dry weight) in the biosolids or sewage sludge.

(Rule 0400-40-15-.04, continued)

"Land with a high potential for public exposure" is land that the public uses frequently. This includes, but is not limited to, a public contact site and a reclamation site located in a populated area (e.g., a construction site located in a city).

"Land with a low potential for public exposure" is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest, and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

"Pathogenic organisms" are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

"pH" means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade.

"Specific oxygen uptake rate" or "SOUR" is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in the biosolids or sewage sludge.

"Total solids" are the materials in biosolids or sewage sludge that remain as residue when they are dried at 103° to 105° Celsius.

"Unstabilized solids" are organic materials in biosolids or sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

"Vector attraction" is the characteristic of biosolids or sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

"Volatile solids" is the amount of the total solids in biosolids or sewage sludge lost when they are combusted at 550° Celsius in the presence of excess air.

(3) Pathogens [40 CFR 503.32]

(a) Biosolids—Class A.

1. The requirement in part 2 of this subparagraph and the requirements in either parts 3, 4, 5, 6, 7, or 8 of this subparagraph shall be met for a biosolids to be classified Class A with respect to pathogens.
2. The Class A pathogen requirements in parts 3 through 8 of this subparagraph shall be met either prior to meeting or at the same time the vector attraction reduction requirements in paragraph (4) of this rule, except the vector attraction reduction requirements in parts (4)(b)6 through 8 of this rule, are met.
3. Class A—Alternative 1
 - (i) Either the density of fecal coliform in the biosolids shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the biosolids shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02.

(Rule 0400-40-15-.04, continued)

- (ii) The temperature of the biosolids that are applied or disposed shall be maintained at a specific value for a period of time.
- (I) When the percent solids of the biosolids are seven percent or higher, the temperature of the biosolids shall be 50° Celsius or higher; the time period shall be 20 minutes or longer; and the temperature and time period shall be determined using Equation (1), except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid.

Equation (1)

$$D = \frac{131,700,000}{10^{0.1400t}}$$

Where,

D = time in days.

t = temperature in degrees Celsius.

- (II) When the percent solids of the biosolids are seven percent or higher and small particles of sewage sludge are heated by either warmed gases or an immiscible liquid, the temperature of the biosolids shall be 50° Celsius or higher; the time period shall be 15 seconds or longer; and the temperature and time period shall be determined using Equation (1).
- (III) When the percent solids of the biosolids are less than seven percent and the time period is at least 15 seconds, but less than 30 minutes, the temperature and time period shall be determined using Equation (1).
- (IV) When the percent solids of the biosolids are less than seven percent; the temperature of the biosolids are 50° Celsius or higher; and the time period is 30 minutes or longer, the temperature and time period shall be determined using Equation (2).

Equation (2)

$$D = \frac{50,070,000}{10^{0.1400t}}$$

Where,

D = time in days.

t = temperature in degrees Celsius.

4. Class A—Alternative 2

- (i) Either the density of fecal coliform in the biosolids shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in the biosolids shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application

(Rule 0400-40-15-.04, continued)

to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02.

- (ii) (I) The pH of the biosolids that are applied or disposed shall be raised to above 12 and shall remain above 12 for 72 hours.
- (II) The temperature of the biosolids shall be above 52° Celsius for 12 hours or longer during the period that the pH of the biosolids is above 12.
- (III) At the end of the 72 hour period during which the pH of the biosolids are above 12, the biosolids shall be air dried to achieve a percent solids in the biosolids greater than 50 percent.

5. Class A—Alternative 3

- (i) Either the density of fecal coliform in the biosolids shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella sp. bacteria in biosolids shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02.
- (ii) (I) The biosolids shall be analyzed prior to pathogen treatment to determine whether the biosolids contains enteric viruses.
- (II) When the density of enteric viruses in the biosolids prior to pathogen treatment is less than one Plaque-Forming Unit per four grams of total solids (dry weight basis), the biosolids are Class A with respect to enteric viruses until the next monitoring episode for the biosolids.
- (III) When the density of enteric viruses in the biosolids prior to pathogen treatment is equal to or greater than one Plaque-Forming Unit per four grams of total solids (dry weight basis), the biosolids are Class A with respect to enteric viruses when the density of enteric viruses in the biosolids after pathogen treatment is less than one Plaque-Forming Unit per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the biosolids that meet the enteric virus density requirement are documented.
- (IV) After the enteric virus reduction in item III of this subpart is demonstrated for the pathogen treatment process, the biosolids continue to be Class A with respect to enteric viruses when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in item III of this subpart.
- (iii) (I) The biosolids shall be analyzed prior to pathogen treatment to determine whether the biosolids contain viable helminth ova.

(Rule 0400-40-15-.04, continued)

- (II) When the density of viable helminth ova in the biosolids prior to pathogen treatment is less than one per four grams of total solids (dry weight basis), the biosolids are Class A with respect to viable helminth ova until the next monitoring episode for the biosolids.
 - (III) When the density of viable helminth ova in the biosolids prior to pathogen treatment is equal to or greater than one per four grams of total solids (dry weight basis), the biosolids are Class A with respect to viable helminth ova when the density of viable helminth ova in the biosolids after pathogen treatment is less than one per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the biosolids that meet the viable helminth ova density requirement are documented.
 - (IV) After the viable helminth ova reduction in item III of this subpart is demonstrated for the pathogen treatment process, the biosolids continue to be Class A with respect to viable helminth ova when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented item III of this subpart.
- (iv) The use of Alternative 3 for Class A pathogen reduction requires prior written approval from the State Biosolids Coordinator.

6. Class A—Alternative 4

- (i) Either the density of fecal coliform in the biosolids shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of *Salmonella* sp. bacteria in the biosolids shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02.
- (ii) The density of enteric viruses in the biosolids shall be less than one Plaque-Forming Unit per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02, unless otherwise specified by the State Biosolids Coordinator.
- (iii) The density of viable helminth ova in the biosolids shall be less than one per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02, unless otherwise specified by the State Biosolids Coordinator.
- (iv) The use of Alternative 4 for Class A pathogen reduction requires prior written approval from the State Biosolids Coordinator.

(Rule 0400-40-15-.04, continued)

7. Class A—Alternative 5
 - (i) Either the density of fecal coliform in the biosolids shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella, sp. bacteria in the biosolids shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02.
 - (ii) Biosolids that are applied or disposed shall be treated in one of the Processes to Further Reduce Pathogens described in paragraph (5) of this rule.
 8. Class A—Alternative 6
 - (i) Either the density of fecal coliform in the biosolids shall be less than 1000 Most Probable Number per gram of total solids (dry weight basis), or the density of Salmonella, sp. bacteria in the biosolids shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the biosolids are applied or disposed; at the time the biosolids are prepared for sale or given away in a bag or other container for application to the land; or at the time the biosolids or material derived from biosolids are prepared to meet the requirements in subparagraph (1)(b) of Rule 0400-40-15-.02.
 - (ii) Biosolids that are applied or disposed shall be treated in a process that is equivalent to a Process to Further Reduce Pathogens as determined by EPA Region 4.
- (b) Biosolids—Class B.
1.
 - (i) The requirements in either part 2, 3, or 4 of this subparagraph shall be met for biosolids to be classified Class B with respect to pathogens.
 - (ii) The site restrictions in part 5 of this subparagraph shall be met when biosolids that meet the Class B pathogen requirements in part 2, 3, or 4 of this subparagraph are applied to the land.
 2. Class B—Alternative 1
 - (i) Seven representative samples of the biosolids that are applied or disposed shall be collected.
 - (ii) The geometric mean of the density of fecal coliform in the samples collected in subpart (i) of this part shall be less than either 2,000,000 Most Probable Number per gram of total solids (dry weight basis) or 2,000,000 Colony Forming Units per gram of total solids (dry weight basis).
 3. Class B—Alternative 2

Biosolids that are applied or disposed shall be treated in one of the Processes to Significantly Reduce Pathogens described in paragraph (5) of this rule.

(Rule 0400-40-15-.04, continued)

4. Class B—Alternative 3

Biosolids that are applied or disposed shall be treated in a process that is equivalent to a Process to Significantly Reduce Pathogens, as determined by EPA Region 4.

5. Site restrictions

- (i) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
- (ii) Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
- (iii) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
- (iv) Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
- (v) Animals shall not be grazed on the land for 30 days after application of biosolids.
- (vi) Turf grown on land where biosolids are applied shall not be harvested for one year after application of the biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the State Biosolids Coordinator.
- (vii) Public access to land with a high potential for public exposure shall be restricted for one year after application of biosolids.
- (viii) Public access to land with a low potential for public exposure shall be restricted for 30 days after application of biosolids.

(4) Vector attraction reduction [40 CFR 503.33]

- (a)
 - 1. One of the vector attraction reduction requirements in parts (b)1 through 10 of this paragraph shall be met when bulk biosolids are applied to agricultural land, forest, a public contact site, or a reclamation site.
 - 2. One of the vector attraction reduction requirements in parts (b)1 through 8 of this paragraph shall be met when bulk biosolids are applied to a lawn or a home garden.
 - 3. One of the vector attraction reduction requirements in parts (b)1 through 8 of this paragraph shall be met when biosolids are sold or given away in a bag or other container for application to the land.
- (b)
 - 1. The mass of volatile solids in the biosolids shall be reduced by a minimum of 38 percent (see calculation procedures in "Environmental Regulations and

(Rule 0400-40-15-.04, continued)

Technology—Control of Pathogens and Vector Attraction in Sewage Sludge," EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268).

2. When the 38 percent volatile solids reduction requirement in part 1 of this subparagraph cannot be met for an anaerobically digested biosolids, vector attraction reduction can be demonstrated by digesting a portion of the previously digested biosolids anaerobically in the laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37° Celsius. When at the end of the 40 days, the volatile solids in the biosolids at the beginning of that period are reduced by less than 17 percent, vector attraction reduction is achieved.
3. When the 38 percent volatile solids reduction requirement in part 1 of this subparagraph cannot be met for an aerobically digested biosolids, vector attraction reduction can be demonstrated by digesting a portion of the previously digested biosolids that have a percent solids of two percent or less aerobically in the laboratory in a bench-scale unit for 30 additional days at 20° Celsius. When at the end of the 30 days, the volatile solids in the biosolids at the beginning of that period are reduced by less than 15 percent, vector attraction reduction is achieved.
4. The specific oxygen uptake rate (SOUR) for biosolids treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20° Celsius.
5. Biosolids shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the biosolids shall be higher than 40° Celsius and the average temperature of the biosolids shall be higher than 45° Celsius.
6. The pH of biosolids shall be raised to 12 or higher by the addition of alkaline material and, without the addition of more alkaline material, shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours.
7. The percent solids of biosolids that do not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75 percent based on the moisture content and total solids prior to mixing with other materials.
8. The percent solids of biosolids that contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90 percent based on the moisture content and total solids prior to mixing with other materials.
9.
 - (i) Biosolids shall be injected below the surface of the land.
 - (ii) No significant amount of the biosolids shall be present on the land surface within one hour after the biosolids are injected.
 - (iii) When the biosolids that are injected below the surface of the land are Class A with respect to pathogens, the biosolids shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process.
10.
 - (i) Biosolids applied to the land surface shall be incorporated into the soil within six hours after application to or placement on the land, unless otherwise specified by the State Biosolids Coordinator.

(Rule 0400-40-15-.04, continued)

- (ii) When biosolids that are incorporated into the soil are Class A with respect to pathogens, the biosolids shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process.
- (5) Pathogen Treatment Processes [Appendix B to Part 503]
- (a) Processes To Significantly Reduce Pathogens (PSRP).
 1. Aerobic digestion—Sewage sludge or biosolids are agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20° Celsius and 60 days at 15° Celsius.
 2. Air drying—Sewage sludge or biosolids are dried on sand beds or on paved or unpaved basins. The sewage sludge or biosolids dry for a minimum of three months. During two of the three months, the ambient average daily temperature is above 0° Celsius.
 3. Anaerobic digestion—Sewage sludge or biosolids are treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55° Celsius and 60 days at 20° Celsius.
 4. Composting—Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge or biosolids is raised to 40° Celsius or higher and remains at 40° Celsius or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55° Celsius. Passively aerated static pile composting is not an acceptable PSRP.
 5. Lime stabilization—Sufficient lime is added to the sewage sludge or biosolids to raise the pH of the sewage sludge or biosolids to 12 after two hours of contact.
 - (b) Processes to Further Reduce Pathogens (PFRP).
 1. Composting—Using either the within-vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge or biosolids is maintained at 55° Celsius or higher for three days. Passively aerated static pile composting is not an acceptable PSRP.

Using the windrow composting method, the temperature of the sewage sludge or biosolids is maintained at 55° or higher for 15 days or longer. During the period when the compost is maintained at 55° or higher, there shall be a minimum of five turnings of the windrow.
 2. Heat drying—Sewage sludge or biosolids are dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge or biosolids to 10 percent or lower. Either the temperature of the biosolids particles exceeds 80° Celsius or the wet bulb temperature of the gas in contact with the biosolids as the biosolids leaves the dryer exceeds 80° Celsius.
 3. Heat treatment—Liquid sewage sludge or biosolids are heated to a temperature of 180° Celsius or higher for 30 minutes.

(Rule 0400-40-15-.04, continued)

4. Thermophilic aerobic digestion—Liquid sewage sludge or biosolids are agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the sewage sludge or biosolids is 10 days at 55 to 60° Celsius.
5. Beta ray irradiation—Sewage sludge or biosolids are irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20° Celsius).
6. Gamma ray irradiation—Sewage sludge or biosolids are irradiated with gamma rays from certain isotopes, such as ⁶⁰ Cobalt and ¹³⁷ Cesium, at dosages of at least 1.0 megarad at room temperature (ca. 20° Celsius).
7. Pasteurization—The temperature of the sewage sludge or biosolids is maintained at 70° Celsius or higher for 30 minutes or longer.

Authority: T.C.A. §§ 69-3-101 et seq. and 4-5-201 et seq. **Administrative History:** Original rule filed April 1, 2013; effective June 30, 2013.

0400-40-15-.05 RESERVED.

Authority: T.C.A. §§ 69-3-101 et seq. and 4-5-201 et seq. **Administrative History:** Original rule filed April 1, 2013; effective June 30, 2013.

0400-40-15-.06 PERMITTING.

- (1) Applicable facilities – Application required

All treatment works treating domestic sewage that want to land apply Class B biosolids are considered to be applicable facilities and shall apply for a permit for the land application of Class B biosolids or submit a notice of intent certification with regard to a general permit for the land application Class B of biosolids.

- (a) Designation as a treatment works treating domestic sewage.

In addition to facilities meeting the definition of a treatment works treating domestic sewage in paragraph (8) of Rule 0400-40-15-.01, the Director may designate any person, site, or facility that treats, uses, transports, stores, or applies biosolids, as a treatment works treating domestic sewage, and require the owner or operator to apply for a permit if any of the following conditions are met:

1. The Director determines that a permit is necessary to protect human health or the environment from the adverse effect of a contaminant in biosolids;
2. The Director determines that a permit is necessary to protect human health or the environment from poor biosolids management practices;
3. The Director determines that a permit is necessary to ensure compliance with any of the requirements in these rules; or
4. Bulk biosolids or sewage sludge originating from a source or location outside the jurisdiction of the State of Tennessee are being applied to the land or received at any site or facility.

- (b) It is a violation of these rules for a facility to fail to submit a permit application or notice of intent to the Division as required by these rules.

(Rule 0400-40-15-.06, continued)

(2) General and individual permits

The Division will issue permits for the land application of biosolids.

- (a) The Division will issue, modify, revoke and reissue, and terminate a general permit in accordance with the provisions of paragraph (23) Appendix .06-E of this rule.
- (b) The Division will accept and consider notices of intent seeking coverage under a general permit and revoke or terminate coverage under a general permit in accordance with the provisions of this rule.
- (c) The Division will issue, modify, revoke and reissue, or terminate individual permits in accordance with the provisions of this rule.

(3) Requirements to apply for coverage under a general permit or to request an individual permit

- (a) After the Division has issued a general permit for the land application of biosolids, all applicable facilities shall apply for coverage under the general permit in accordance with paragraph (4) of this rule unless any of the following apply:

- 1. The facility has a current individual permit issued in accordance with these rules;
- 2. The Division requires a facility to apply for an individual permit;
- 3. On written request of the applicant, the Division has granted permission to apply for an individual permit;

(Note: (i) A facility may request an individual permit if a practice it proposes is not addressed in a general permit issued by the Division.

(ii) A facility may seek coverage under a general permit for any portion of its biosolids management practices that are applicable under the general permit and may also request an individual permit for any portion of its biosolids management practices that are not applicable under the general permit.)

- 4. The Division may require any facility applying for an individual permit in accordance with part 3 of this subparagraph to limit its practices for the land application of biosolids to those that are authorized in a general permit and to apply for coverage under a general permit; or
 - 5. The facility produces EQ Biosolids and submits documentation in the form of an annual report in accordance with 40 CFR Part 503.18 that the product is EQ Biosolids to the State Biosolids Coordinator on or before February 19th of each calendar year.
- (b) Facilities that apply to the Division for coverage under a general permit through the submittal of a notice of intent (NOI) will be self-centered for coverage and will not require a notice of coverage (NOC) from the Division if they meet one of the following criteria:
 - 1. The facility is a certified biosolids management agency under that National Biosolids Partnership's Environmental Management System, in which case the facility shall submit documentation of certification to the State Biosolids Coordinator on or before January 15th of each calendar year; or

(Rule 0400-40-15-.06, continued)

2. The facility land applies Class B biosolids to their own property. To land apply Class B biosolids to a site(s) not owned by the facility would require the facility to obtain an NOC from the Division only for the site(s) not owned by the facility.

(4) Timing of permit applications

- (a) Existing facilities seeking coverage under the initial general permit.

Existing facilities seeking coverage under a general permit shall submit a notice of intent for coverage within 60 days after issuance of the applicable general permit by the Division. However, on a case-by-case basis the Division may grant an extension up to a maximum of one year after issuance of the applicable general permit. Requests for an extension shall be made in accordance with the following:

1. Requests shall be made in writing to the State Biosolids Coordinator; and
2. Requests shall be made within 60 days after issuance of the applicable general permit.

- (b) Existing facilities requesting an individual permit.

Existing facilities that wish to request an individual permit under part (3)(a)3 of this rule shall do so within 60 days of issuance of the applicable general permit by the Division.

- (c) Facilities required or approved to apply for an individual permit.

Facilities that have been directed by the Director to apply for an individual permit in accordance with part (3)(a)2 of this rule or approved to apply for an individual permit requested in accordance with part (3)(a)3 of this rule shall submit a permit application within 60 days of receiving notification.

(5) Timing of notices of intent – continuing coverage

- (a) All facilities permitted in accordance with this rule shall submit a notice of intent to continue coverage under a general permit or an application for a new individual permit at least 180 days prior to the expiration date of their applicable permit.
- (b) When a facility has submitted a timely and sufficient notice of intent or application as required in this paragraph, coverage under an expiring permit remains in effect and enforceable until any of the following occur:
1. The application or notice of intent has been denied and time for any appeal has expired; or
 2. A replacement individual or general permit has been issued by the Division and time for any appeal has expired.
- (c) Coverage under a permit for permittees who fail to submit a timely and sufficient notice of intent or application shall cease on the expiration date of the permit.

(6) Individual permit application contents

All facilities shall submit a complete and factually correct individual permit application in accordance with the schedule in paragraph (4) of this rule on a form or in a format specified by the Division. The content requirements are listed in paragraph (23) Appendix .06-A of this rule.

(Rule 0400-40-15-.06, continued)

(7) Notice of intent contents

Facilities submitting a notice of intent to be covered under an applicable general permit shall do so on a form provided by the Division in the general permit.

(8) Land application plans

(a) Exemptions for exceptional quality biosolids. Land application plans are not required when exceptional quality biosolids are applied to the land.

(b) Land application plans are required when biosolids are applied to the land. Facilities that propose to apply nonexceptional quality biosolids to the land shall do one or both of the following:

1. Submit with their permit application or notice of intent a site specific land application plan for each site where biosolids will be applied during the life of the permit; and/or

2. Submit with their permit application or notice of intent a general land application plan, a letter dated at least 60 days prior to applying biosolids, and a site specific land application plan for each site where biosolids will be applied to the land.

(c) Any site specific land application plans shall be consistent with a facility's general land application plan, if a general land application plan has been submitted.

(d) Site specific land application plan contents.

Each site specific land application plan shall provide information necessary to determine if the site is appropriate for land application of biosolids and a description of how the site will be managed. The minimum content for site specific land application plans is listed in paragraph (23) Appendix .06-C of this rule.

(e) General land application plan contents.

Applicants intending to apply nonexceptional quality biosolids to sites for which a site specific land application plan is not submitted as a part of the permit application shall submit for approval, as a part of their permit application, a general land application plan. The minimum content for general land application plans is listed in paragraph (23) Appendix .06-D of this rule.

(f) As individual sites are identified in accordance with the general land application plan in subparagraph (e) of this paragraph, facilities that seek to apply nonexceptional quality biosolids shall develop and submit site specific land application plans in accordance with subparagraph (d) of this paragraph.

(g) All land application plans are subject to review and final approval by the State Biosolids Coordinator. If a land application plan is found to be insufficient, the State Biosolids Coordinator may either request additional information or may impose additional requirements as a condition of approval in accordance with paragraph (16) of this rule.

(9) Submitting permit applications and notices of intent

Facilities shall submit their permit application and notice of intent to the State Biosolids Coordinator.

(Rule 0400-40-15-.06, continued)

(10) Signatories to permit applications and reports

(a) Applications. All permit applications shall be signed as follows:

1. For a municipality, state, federal, or other public agency.

By either a principal executive officer or ranking elected official. For purposes of this rule, a principal executive officer of a federal agency includes either of the following:

- (i) The chief executive officer of the agency; or
- (ii) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

(b) Reports and other information.

All reports and other information required by permits and other information requested by the Division shall be signed by a person described in subparagraph (a) of this paragraph or by a duly authorized representative of that person. A person is a duly authorized representative only if the following conditions are met:

1. The authorization is submitted to the State Biosolids Coordinator in writing by a person described in subparagraph (a) of this paragraph; and
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

(c) Changes to authorization.

If an authorization in accordance with subparagraph (b) of this paragraph is no longer accurate, a new authorization satisfying the requirements of subparagraph (b) of this paragraph shall be submitted to the State Biosolids Coordinator prior to or together with any reports or other information.

(d) Certification.

Any person signing a document in accordance with subparagraph (a) or (b) of this paragraph shall make the following certification, unless a different certification is applicable in accordance with another related requirement of these rules:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(11) Reserved

(12) Recordkeeping required for permit application

(Rule 0400-40-15-.06, continued)

Applicants shall keep records of all information used to complete permit applications, and any supplemental information submitted, for a period of five years, or longer if otherwise required by these rules, the conditions of the applicable permit, or other state laws.

(13) Public notice and comment period

Public notices and comment periods shall be in conformance with Rule 1200-04-05-.06 requirements.

(14) Compliance schedules

(a) A permit may specify a schedule leading to compliance with the federal Clean Water Act and these rules. Any compliance schedule in accordance with this paragraph shall require compliance as soon as possible, but not later than any applicable statutory deadline under the CWA or the Tennessee Water Quality Control Act.

(b) Interim dates. If a permit establishes a compliance schedule that exceeds one year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement. The time between interim dates shall not exceed six months.

(c) Reporting. The permit shall require that no later than 14 days after each interim date and the final date of compliance, the permittee shall notify the Division in writing of its compliance or noncompliance with the interim or final requirements.

(15) Fact sheet required for individual permits

(a) The Division shall prepare a fact sheet for every draft individual permit for biosolids application.

1. The fact sheet shall briefly set forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit.

2. The Division shall send this fact sheet to the applicant and, on request, to any other person.

(b) Fact sheet content. The facts sheet shall include all of the following:

1. A brief description of the type of facility or activity that is the subject of the draft permit;

2. Any calculations or other necessary explanation of the derivation of conditions for biosolids application, including a citation to the applicable standards for biosolids application and reasons why they are applicable, or in the case of conditions developed on a case-by-case basis to implement § 405(d)(4) of the CWA, an explanation of and the basis for the conditions; and

3. For permits that include a general land application plan, a brief description of how each of the required elements of the land application plan is addressed in the permit.

(16) Additional or more stringent requirements

(a) On a case-by-case basis, the Division may impose requirements for the land application of biosolids that are in addition to or more stringent than the requirements in

(Rule 0400-40-15-.06, continued)

these rules if the Division finds that the additional or more stringent requirements are necessary to protect public health or the environment from any adverse effect of a contaminant in the biosolids or to ensure compliance with these rules. Imposition of such requirements will be done through issuance of an individual permit.

- (b) In addition to other considerations, failure of a generator, applier, or landowner to conform to any applicable requirements of these rules may be cause to impose additional or more stringent requirements through issuance of an individual permit.

(17) Prohibition

The Division may not issue a permit when the Regional Administrator of EPA has objected in writing in accordance with 40 CFR 123.44.

(18) Duration of permits

- (a) Permits are issued for fixed terms up to, but not exceeding, 5 years from the effective date of the permit. Final coverage under a general permit may be issued for a period up to the remaining term of issuance for the permit.
- (b) The term of a permit may not be extended by modification beyond 5 years.

(19) Transfer of permit coverage

- (a) Except as provided in subparagraph (b) of this paragraph, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued, to identify the new permittee and incorporate other requirements as may be necessary to assure compliance with the requirements of these rules.
- (b) Automatic transfer.

Coverage under a permit is automatically transferred from the old permittee to a new permittee on the date agreed to if all of the following conditions are met:

1. A written, signed agreement between the old and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability is submitted to the Division; and
 2. The Division has not notified both permittees of any objection to the transfer, or of the intent to revoke the permit.
- (c) No condition or requirement of a permit or these rules may be waived by the transfer of permit coverage from one party to another.

(20) Modification or revocation and reissuance of permits

- (a) When the Division receives any information (for example, upon inspection of a facility, receipt of information submitted by the permittee as required in the permit, receipt of a request for modification or revocation and reissuance, or upon a review of the permit file), the Division may determine whether or not one or more of the causes listed in subparagraph (b) or (c) of this paragraph for modification, or revocation and reissuance, or both, exist.
 1. If cause for modification, or revocation and reissuance, or both, exists, the Division may modify or revoke and reissue a permit and may request an update application, if necessary.

(Rule 0400-40-15-.06, continued)

2. When a permit is modified, only the conditions subject to modification are reopened.
 3. If a permit is revoked and reissued, the entire permit is reopened and subject to revision, and the permit may be reissued for a new term.
 4. If cause does not exist in accordance with this paragraph, the Division may not modify or revoke and reissue a permit.
- (b) Causes for modification. The following are causes for modification, but not revocation and reissuance of permits except when the permittee requests or agrees.
1. Alterations. There are material and substantial alterations or additions to the permitted facility or activity that occurred after permit issuance that justify the application of permit conditions that are different from or absent in the existing permit.
 2. Information. The Division has received new information. A permit may be modified during its term for this cause only if the information was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and would have justified the application of different permit conditions at the time of issuance.
 3. New regulations. New regulations have been adopted or the standards or regulations on which the permit was based have been changed by adoption of amended standards or regulations or by judicial decision after the permit was issued.
 4. Compliance schedules. The Division determines good cause exists for modification of a compliance schedule, such as an act of God, flood, or materials shortage or other events over which the permittee has little or no control and for which there is no reasonable available remedy. However, in no case may a compliance schedule be modified to extend beyond an applicable CWA statutory deadline.
 5. Land application plans. When required by a permit condition to incorporate a general land application plan for beneficial use of biosolids, to revise a general land application plan, or to add a general land application plan.
- (c) Causes for modification or revocation and reissuance. The following are causes to modify or, alternatively, revoke and reissue a permit:
1. Cause exists for termination in accordance with paragraph (21) of this rule and the Division determines that modification or revocation and reissuance is appropriate; or
 2. The Division has received notification of a proposed transfer of the permit.
- (21) Causes for termination of permits, denying permit applications, or denying expansion of an existing permit
- The following are causes for terminating a permit during its term, or for denying a permit application, or for denying an expansion of an existing permit:
- (a) Noncompliance by the permittee with any condition of the permit;

(Rule 0400-40-15-.06, continued)

- (b) The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time;
- (c) A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination; and/or
- (d) A change in any condition that requires either a temporary or a permanent reduction or elimination of any activity controlled by the permit.

(22) Reserved

(23) Appendices

Appendix .06-A Minimum Content for a Permit Application

- (1) The activities conducted by the applicant that require it to obtain a permit.
- (2) Name, mailing address, and location of the facility for which the application is submitted.
- (3) The operator's name, address, telephone number, ownership status, and status as federal, state, private, public, or other entity.
- (4) Whether or not the facility or any associated facilities or land applications sites are located on federal lands.
- (5) A map extending 1 mile (1.6 kilometers) beyond the property boundaries of the facility, showing the location and means of access to the facility.
- (6) Any biosolids monitoring data the applicant has for the last 2 years.
- (7) A description of the applicant's biosolids application practices including, where applicable, the location of any sites where the applicant transfers biosolids for treatment, as well as the name of the applicator or other contractor who applies the biosolids to land if different from the applicant.
- (8) Land application plans, as required by paragraph (8) of Rule 0400-40-15-.06.
- (9) The amount of biosolids produced and the amount of biosolids applied to the land during the previous year.
- (10) Any information required to determine the appropriate standards for permitting in accordance with these rules, and any other information the Division may request and reasonably require to assess biosolids application, to determine whether or not to issue a permit, or to ascertain appropriate permit requirements in accordance with these rules.

Appendix .06-B (Reserved)

Appendix .06-C Minimum Content for a Site Specific Land Application Plan

- (1) If biosolids containing contaminants in excess of the values in Table 3 of part (3)(b)3 of Rule 0400-40-15-.02 have ever been applied to the site, then provide the following:
 - (a) The date(s) when the biosolids were applied;

(Rule 0400-40-15-.06, continued)

- (b) The amount of biosolids applied;
 - (c) The concentration of the contaminants in the biosolids; and
 - (d) The area(s) of the site to which the biosolids were applied.
- (2) A discussion of the types of crops grown or expected to be grown, their intended end use (e.g., pasture grass for a feed crop, corn as a feed crop), and the current distribution of crops on the site.
- (3) An explanation of how agronomic rates will be determined during the life of the site, along with any currently available calculations. Whenever agronomic rates or the method used to determine agronomic rates change, an update of the agronomic rate calculations shall be filed with the Division.
- (4) Method(s) of application.
- (5) Seasonal biosolids applications.
- (6) The name of the county where biosolids will be applied.
- (7) A description of how biosolids will be stored at the site that also addresses related off-site storage.
- (8) Map(s) for the site(s) shall be submitted. Maps shall be of an appropriate scale to show the detail necessary for evaluation of the proposed application areas and so that a person may reasonably be able to locate the sites and any application units within a site (for example, 1:7920 [8 inches to the mile] for detailed information with an overview map at 1:63,360 [1 inch to the mile]). Minimally, maps shall provide the following information:
- (a) A legend;
 - (b) The location and means of access;
 - (c) Specific areas of the site where biosolids may be applied (If there is more than one site or more than one application unit within a site, a site or unit ID number should be included);
 - (d) The number of acres in the site or in any distinct application unit within a site;
 - (e) Location and extent of any wetlands on the site;
 - (f) A topographic relief of the application site and surrounding area;
 - (g) Any seasonal surface water bodies located on the site;
 - (h) Any perennial surface water bodies located on the site;
 - (i) The location of any wells located on the site that are listed in public records or otherwise known to the applicant, whether for domestic, irrigation, or other purposes;
 - (j) Buffer zones to surface waters, wells, and sink holes;
 - (k) The location and size of any areas that will be used to store biosolids;

(Rule 0400-40-15-.06, continued)

- (l) A description of how access to the site will be restricted (e.g., signs posted around the site or other approved method of access restriction);
- (m) A copy of any landowner agreement; and
- (n) Any additional information requested by the State Biosolids Coordinator that is needed to evaluate the appropriateness of the site for biosolids application.

Appendix .06-D Minimum Content for a General Land Application Plan

- (1) Describes the geographical area covered by the plan, including the names of all counties where biosolids may be applied.
- (2) Identifies site selection criteria.
- (3) Describes how sites will be managed.
- (4) Provides for not less than 30 days advance notice to the State Biosolids Coordinator of new or expanded land application sites to allow time for the State Biosolids Coordinator to object prior to the biosolids application.

Appendix .06-E Procedures for Issuing General Permits

- (1) General permit coverage
 - (a) The Division may issue general permits to satisfy any or all of the biosolids management requirements in these rules or other applicable state or federal biosolids management requirements.
 - (b) The Division may issue general permits to cover categories or subcategories of facilities with appropriate geographic areas.
 - (c) General permits may be written to cover categories of treatment works treating domestic sewage that meet all of the following requirements:
 - 1. Involve the same or substantially similar types of operations;
 - 2. Engage in the same types of biosolids application practices;
 - 3. Require the same or substantially similar operating conditions or standards for biosolids application;
 - 4. Require the same or substantially similar monitoring; and
 - 5. In the opinion of the Director, are more appropriately controlled under a general permit than under individual permits.
- (2) General permit preparation – preliminary determination

For all general permits, the Director shall make a preliminary determination to develop a general permit.

- (a) Interested persons may petition the Director requesting that a category of facilities be considered for the development of a general permit.
- (b) The Director shall respond to such a petition within 90 days of receipt.

(Rule 0400-40-15-.06, continued)

(3) Fact sheets

(a) The Director shall prepare a fact sheet for every general permit determination. Such fact sheet shall summarize the following:

1. The legal basis of the permitting program;
2. The type of facility or activity which is the subject of the general permit;
3. The geographical area for which the general permit is valid;
4. The criteria for which coverage under a general permit will be approved;
5. If available, a listing or some other means of identifying the facilities proposed to be covered under the general permit;
6. The information required to be submitted as part of the application for coverage under the general permit;
7. The general characteristics of the facilities being authorized under the general permit;
8. Standards and limitations imposed in the general permit;
9. A general description of the conditions in the general permit;
10. Any compliance schedules proposed as part of the general permit;

(b) The Division shall provide copies of general permit fact sheets to any interested person upon request.

(4) Reserved

(5) Public notice

The Division shall provide public notice of all preliminary determinations to develop a general permit, all determinations not to develop a general permit after publishing such a preliminary determination, all draft general permit determinations, and the issuance of a final general permit. All public notices shall be circulated in a manner designated to inform interested and potentially affected persons of the proposed general permit.

(a) Public notice for preliminary determinations. The Division shall provide public notice of all preliminary determinations to develop a general permit as follows:

1. Public notice shall be circulated within the geographical area of the proposed general permit. Such notice may include any or all of the following:
 - (i) Publishing, as a paid advertisement or legal notice, the Division's preliminary determination in one or more major newspaper(s) throughout the area of proposed coverage; and/or
 - (ii) Issuance of news releases, focus sheets, or newsletters.

(Rule 0400-40-15-.06, continued)

2. The Division shall request comments on whether a general permit is appropriate for the proposed category of facilities or whether individual permits are necessary.
 3. The public notice shall provide an opportunity for any interested or potentially affected party to submit information on facilities proposed to be covered under a general permit including:
 - (i) Any documented information on the characteristics of the biosolids including quantity, quality, and any land application sites. Information may be from an individual facility or be representative of the category as a whole; and
 - (ii) Any other relevant information.
 4. The Division shall add the name of any person, upon request, to a general permit specific mailing list to receive information and notices related to the development of the general permit.
- (b) In the event that the Division determines not to develop a general permit after publishing a preliminary determination in accordance with subparagraph (a) of this paragraph, the Division shall provide public notice to that effect.
- (c) Public notice for draft general permits. The Division shall provide public notice of every draft general permit as follows:
1. The notice shall be circulated throughout the geographical area covered by the general permit. Such circulation may include any or all of the following:
 - (i) Posting for a period of 30 days in post offices, public libraries, and public places within the geographical area covered by the general permit.
 - (ii) Publishing the notice as a paid advertisement, display advertisement, or legal notice, in one or more major local newspapers of general circulation serving the area covered by the general permit.
 - (iii) Issuance of news releases, focus sheets, or newsletters.
 2. Notice shall be mailed to any person upon request, including all persons on the general permit specific mailing list established in accordance with (a)4 of this paragraph and all known potential permittees.
 3. Reserved
 4. Public comment period. The Division shall provide a period of not less than 30 days following the last publication of the public notice, during which time interested persons may submit their written views on a draft general permit determination. All written comments submitted during the comment period shall be retained by the Division and considered in the formulation of its final determination with respect to the draft general permit. The period for comment may be extended at the discretion of the Division.
 5. The Division shall make available during the public comment period:
 - (i) The draft general permit;

(Rule 0400-40-15-.06, continued)

- (ii) The fact sheet on the draft general permit required in accordance with paragraph (3) of this Appendix; and
 - (iii) A copy of the proposed application for coverage.
6. The contents of the draft general permit public notice shall, at a minimum, summarize the following:
- (i) The name, address, and phone number of the agency issuing the public notice;
 - (ii) The type of facilities and activities which are the subject of the general permit;
 - (iii) The geographical area for which the general permit is valid;
 - (iv) The criteria for which coverage under the general permit will be approved;
 - (v) If available, a listing or some other means of generally identifying the facilities proposed to be covered under the general permit;
 - (vi) The tentative determination to issue a general permit;
 - (vii) The procedures for the formulation of final determinations, including the 30-day comment period required by part (c)4 of this paragraph and any other means by which interested persons may comment upon those determinations;
 - (viii) The date, time, and place when the public hearing(s) required in paragraph (7) of this Appendix will be held;
 - (ix) The address and phone number of locations at which interested persons may obtain further information; and
 - (x) The date and time after which comments will not be considered by the Division in formulating the final determination on the draft general permit.
- (d) Public notice for final general permits.

The Division shall provide public notice of the issuance of a final general permit as follows:

1. The notice of general permit issuance shall be circulated in a manner similar to that used to circulate the notice on the draft general permit in part (c)1 of this paragraph.
2. The notice of general permit issuance shall be provided to all persons on the general permit specific mailing list established in accordance with part (a)4 of this paragraph and all known potential permittees.
3. The public notice of the issuance of a general permit shall contain:
 - (i) The name, address, and phone number of the agency issuing the public notice;

(Rule 0400-40-15-.06, continued)

- (ii) The type of facilities and activities which are the subject of the general permit;
- (iii) The geographical area for which the general permit is valid;
- (iv) The criteria for which coverage under a general permit will be approved;
- (v) If available, a listing or some other means of generally identifying the facilities proposed to be covered under the general permit;
- (vi) A summary of the application process by which eligible facilities may obtain coverage under the general permit;
- (vii) An explanation of any changes to the final general permit, other than editing changes, and the principal reasons for adopting the changes;
- (viii) A notice that the terms and conditions of the general permit may be appealed and include the necessary instruction regarding the appeal process; and
- (ix) The date after which the general permit will be effective. The effective date of a general permit shall be no sooner than 30 days after the publication of the public notice in accordance with part 1 of this subparagraph.

(6) Notice to other government agencies

The Division shall notify other appropriate government agencies of each draft general permit determination and shall provide such agencies an opportunity to submit their written views and recommendations.

(7) Public hearings

- (a) The Division shall hold one or more public hearing(s) on all draft general permits. The public hearing shall be held during the public comment period provided in accordance with part (5)(c)4 of this Appendix.
- (b) The date, time, and place will be at the discretion of the Division provided:
 - 1. At least 30 days is provided between the time the public notice is published in accordance with part (5)(c)1 of this Appendix and the time the hearing is held; and
 - 2. The hearing location is within the geographical area covered by the general permit.
- (c) The Division shall cause a record to be made of all hearings required by this Appendix. The record may be stenographic, mechanical, or electronic.

(8) Public access to information

- (a) The Division shall make identifiable public records related to all general permits available to the public for inspection and copying in accordance with the Division's copying policies.
- (b) Reserved

(Rule 0400-40-15-.06, continued)

(c) General permit development file.

The Division shall prepare a general permit development file for each issued general permit. The general permit development file shall be available for public inspection subject to the provisions of this Appendix. The general permit development file shall contain:

1. Copies of all public notices required in accordance with paragraph (5) of this Appendix;
 2. A copy of the fact sheet required in accordance with paragraph (3) of this Appendix and any other documents not readily available to the public which were used in developing the terms and conditions of the general permit;
 3. Reserved
 4. Copies of the draft and final general permits and the application for coverage;
 5. All written comments received during the public comment period in accordance with part (5)(c)4 of this Appendix on the draft general permit, fact sheet, and application for coverage;
 6. The record of public hearings produced in accordance with subparagraph (7)(c) of this Appendix; and
 7. The response to comments prepared in accordance with subparagraph (9)(a) of this Appendix.
- (d) The Division shall add the name of any person, upon request, to a mailing list to receive notices of Division actions associated with a general permit.
- (e) The Division shall provide facilities for the inspection of information relating to general permits and shall ensure that employees honor requests for such inspection promptly without undue requirements or restrictions. The Division shall either:
1. Ensure that a machine or device for the copying of papers and documents is available for a reasonable fee; or
 2. Otherwise provide for, or coordinate with, copying facilities or services such that requests for copies of nonconfidential, identifiable public records be honored promptly.
- (9) Issuance of general permits
- (a) At the close of the public comment period required by part (5)(c)4 of this Appendix, the Division shall prepare a response to all relevant comments received (both written and verbal) and shall briefly describe any changes, other than editing changes, and the principal reasons for making the changes to the draft general permit.
 - (b) General permits shall be deemed issued upon signing by the Director.
 - (c) The Division shall provide public notice of the issuance of all final general permits in accordance with subparagraph (5)(d) of this Appendix.

(Rule 0400-40-15-.06, continued)

- (d) General permits become effective 30 days after the date of publication of the public notice issued in accordance with subparagraph (5)(d) of this Appendix, unless a later date is specified by the Division.

(10) Appeals

- (a) The terms and conditions of a general permit, as they apply to the appropriate class of facilities, are subject to appeal within 30 days of issuance of the general permit.
- (b) The terms and conditions of a general permit, as they apply to an individual facility, are appealable within 30 days of the effective date of coverage of that facility. This appeal is limited to the general permit's applicability or non applicability to that individual facility.
- (c) The appeal of general permit coverage of an individual facility does not affect any other facilities covered under the general permit. If the terms and conditions of a general permit are found to be inapplicable to any individual facility, the matter shall be remanded to the Director for consideration of issuance of an individual permit or permits.

(11) Modification, revocation and reissuance, and termination of general permits

A general permit may be modified, revoked and reissued, or terminated, during its term for cause including, but not limited to, the following:

- (a) A change occurs in the technology or practices for control or abatement of contaminants applicable to the category of facilities covered under the general permit.
- (b) New biosolids or sewage sludge guidelines or standards are promulgated pursuant to the Tennessee Water Quality Control Act, §§ T.C.A 69-3-101 et seq., for the category of facilities covered under the general permit.
- (c) Information is obtained which indicates that cumulative effects on the environment from facilities covered under the general permit are unacceptable.

(12) Notice for determinations to modify or revoke

In the event that the Division has determined to modify or revoke, in whole or in part, a general permit in accordance with paragraph (11) of this Appendix, the Division shall notify, in writing, all facilities covered under the general permit. The notification shall include:

- (a) The reason(s) why the general permit is being revoked or modified;
- (b) The process for appealing the determination;
- (c) An application form and a time limit for submitting the application; and
- (d) Any other information determined to be relevant by the Division.

Authority: T.C.A. §§ 69-3-101 et seq. and 4-5-201 et seq. **Administrative History:** Original rule filed April 1, 2013; effective June 30, 2013.



SP500

**The University of Tennessee
Agricultural Extension Service
and
Tennessee Division of Water Pollution
Control**

**Best Management
Practices (BMPs)
for Land
Application of
Biosolids**



Best Management Practices (BMPs) for Land Application of Biosolids

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With increasing costs in production agriculture, many landowners are considering biosolids as a safe, inexpensive source of crop nutrients. Many landowners have found success using biosolids and eagerly recommend biosolids to their neighbors. The use of best management practices (BMPs) by wastewater treatment plants, haul truck operators and landowners during the application of biosolids results in landowner satisfaction and good public perception.

Unfortunately, not every wastewater treatment plant is finding success with biosolids marketing and, all too often, practices have resulted in complaint generation. Just a little negative publicity can derail an application program. Consider the following factors as integral parts of a best management plan for land application of biosolids.

Factors Affecting Public Perception

Haul Routes

When considering application sites, do not forget to evaluate haul routes and timing. Loud trucks roaring past school crossings or bus stops may cause some concerns from parents. Use of exhaust brakes, exceeding speed limits and early morning and late evening hauling are all

potential complaints. **The BMP would be to avoid residential areas for all haul routes, especially before or after school.**

Trucks used for biosolids application are heavy and can cause considerable damage to roads if the same traffic patterns are used often. Some dialogue with the local traffic department before haul routes are established may help avoid future problems.

Spills

Any biosolids spilled onto highways must be cleaned up immediately. Some lime-stabilized biosolids are very slippery when wet, causing potentially hazardous conditions. Trucks hauling biosolids must be designed to prevent spillage onto roadways. Biosolids should not be loaded into dump trucks unless the truck bed is leakproof for the type of biosolids to be transported. Obviously, trucks must not be overloaded and transfer hoses must be completely emptied before entering roadways. It is mandatory that a proactive maintenance program on all biosolids application and hauling equipment are enacted and repairs are made before hazardous conditions result. A successful land application program will always pursue the goal of zero complaint generation. Review protocol for spill cleanup and reporting with regulatory agencies before the accident happens. **Remember that if a spill occurs, the BMP is to clean it up!**

Safety Concerns

Carefully evaluate all application sites, looking critically for any potential problems. For example, applying lime-stabilized biosolids near a school should not be a problem. However, if the biosolids dry and become dusty and if the wind direction changes and recess occurs while downwind of the application site, some children will probably experience burning eyes from the lime dust. Always evaluate the site and increase the border area around application sites near home sites, schools or other public areas. **Remember that the BMP for safety is to**

anticipate potential problems so they can be avoided before they occur. As application sites become more urban, more planning is mandatory.

Equipment Operation and Considerations

Successful land application of biosolids and zero complaint generation are similar goals. Having well-maintained vehicles that operate quietly, obeying all traffic laws and leaving no trail of biosolids on streets is just the beginning of a successful land application program. All vehicles should be clean and routinely washed. Remember that the next load of material a dump truck will carry may not be biosolids. For example, a load of sand hauled behind a load of biosolids may smell like biosolids if the truck bed is not washed after the last load of biosolids. If biosolids are spilled onto the vehicle during loading, hose off the vehicle before hauling to the application site. Muddy conditions are often encountered at application sites. However, mud tracked onto roadways should be promptly removed to eliminate any hazardous conditions on roadways. Because people often smell what they see, odors can be reduced by using clean equipment. Again, keeping equipment clean, cleaning mud from roadways, preventing spills, etc., all enhance community acceptance and improve the public image of biosolids recycling.

Consider the following BMPs:

- **Keep haul vehicles quiet and leave no mud on the road.**
- **Encourage equipment operators to keep all equipment clean!** Daily cleaning of equipment, routine maintenance and having conscientious equipment operators will go a long way toward improving public perception of recycling biosolids nutrients.
- **Clean haul vehicle beds well before hauling other materials.**

Odor

All biosolids management plans must address odors as a potential problem. Nuisance complaints from odors are common and create an unfavorable public reaction. Potential for odors can be reduced by utilizing the following BMPs:

- **Incorporate or inject liquid biosolids soon after application to the site.** Soil absorbs moisture from biosolids, which reduces odors as the biosolids dry. Faster drying or incorporation of biosolids at the application site will result in reduced odor generation.
- **Avoid application to wet or waterlogged soil.** Obviously, wet soils will absorb little water from applied biosolids, resulting in potential odors for longer periods. Similarly, biosolids stockpiled at the application site can produce odors until all are land-applied. Minimizing the time biosolids are stockpiled can reduce odors and complaints.
- **Use proper application rates.** Over-applying biosolids can result in runoff and pools of liquid biosolids in low areas that can generate odors. Applying biosolids at an agronomic rate helps prevent these situations.
- **Isolate application sites from residential, public access and commercial areas.** Keeping application sites away from these areas will limit potential for complaints.

Soils and sites

Carefully evaluate each site for potential groundwater and surface water contamination. Areas with karst topography require additional evaluation. Karst topography is underlain by limestone bedrock that has dissolved, resulting in landscapes with enclosed drainage systems. In some areas of Middle and East Tennessee, streams drain into sinkholes, thereby creating a direct shunt to groundwater. Over-application of biosolids in these areas may result in groundwater contamination.

At biosolids application sites, consider filter strips and borders around application sites as BMPs. Consider borders or filter strips in the following situations:

- **Provide a minimum border of 100 feet around all application sites.** No biosolids should be applied in these zones between application areas and roadways, streams, fencerows, etc.
- **Provide a minimum border of 300 feet around all home sites, water wells and sinkholes.**
- **For side-discharge spreaders, always throw biosolids toward the center of the field, never toward the outside.** Underestimating how far biosolids are applied can result in roadways (and cars!) getting hit with biosolids. And each hit will probably generate at least one complaint!

Evaluating soils at the application site can help prevent ground and surface water contamination. Soils that have either a high permeability (sandy soils) or a low permeability (clayey soils) may present special application planning. Evaluating soil texture in concert with slope and topography can help ensure that ground and surface waters are protected. Sites with slopes in excess of 8-12 percent should be avoided because of runoff. Likewise, soils shallow to bedrock provide little protection from ground-water contamination and should be avoided.

When evaluating soils at application sites, also evaluate the depth to groundwater at the site. Sites shallow to groundwater provide less buffer and greater potential for groundwater contamination. Following simple BMPs for all biosolids applications is an effective way to recycle nutrients and build a more sustainable future.

The Tennessee Department of Environment and Conservation is committed to principles of equal opportunity, equal access and affirmative action. Contact the Tennessee Department of Environment and Conservation EEO/AA Coordinator, (615) 532-0103 or the ADA Coordinator, Isaac Okoreeh-Baah, (615) 532-0059 for further information. Hearing impaired callers may use the Tennessee Relay Service (1-800-848-0298).

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