NATIONAL BIOSOLIDS DATA PROJECT

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TENNESSEE

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

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Biosolids Management and Oversight in TN

In Tennessee, two-thirds of biosolids are beneficially used through bulk application of Class A or B biosolids to farmland or reclamation sites as soil amendment, or through distribution of exceptional quality (EQ) products for use in landscaping, agriculture, yards, parks, and more. Treatment methods to reach Class A or EQ quality include composting (Maryville, Smyrna, Sevier County), heat drying (Nashville, Athens, Newport), advanced alkaline stabilization (McMinnville, Gallatin, Dickson, Cookeville), and autothermal thermophilic aerobic digestion (ATAD – Lebanon). Biosolids not beneficially used are disposed of at landfills or surface disposal sites. No TN solids are incinerated.

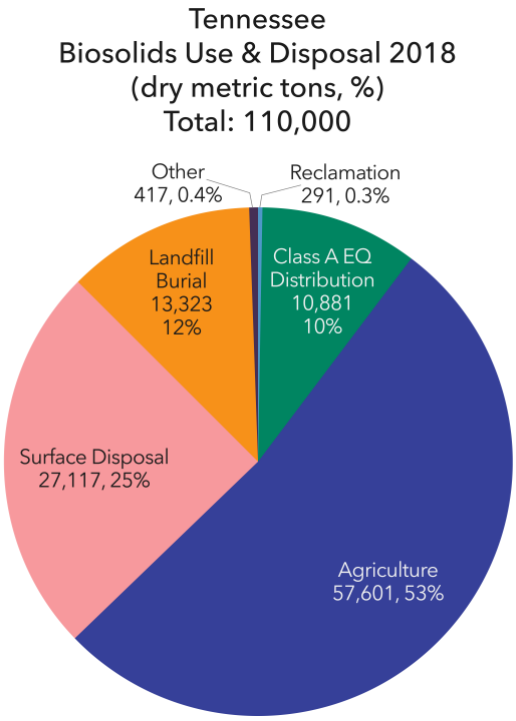
The Department of Environment & Conservation (TN DEC) oversees biosolids management. Tennessee's biosolids rule (0400-40-15) mirrors the federal rule, 40 CFR Part 503. TN DEC issues general and individual permits for land application of non-EQ biosolids through a process that requires submission by the biosolids preparer or land applier of a Notice of Intent and a Land Application Plan. Class A EQ biosolids are exempt from end use and site restrictions. Nitrogen is the basis for the agronomic loading rate for land application. A unique feature of TN regulations is that some regulatory requirements are reduced if a biosolids program is operated under a formal Biosolids Management System (Environmental Management System) certified by the National Biosolids Partnership. Chattanooga and Knoxville are examples of NBP-recognized programs.

Septage can be land applied if requirements are met (state rule 0400-48-01.20), but preference for septage disposal is for treatment at water resource recovery facilities (WRRFs), and that's the dominant practice. Roughly 15 septage disposal sites have been permitted for use by certain septage pumpers as an alternative to hauling to a WRRF. The state lists 122 septage haulers operating in TN.

The trends in biosolids recycling in TN in 2018 - 2022 are continued interest and a slow increase in beneficial use of biosolids, with new and improved solids treatment processes, such as heat drying at medium-sized WRRFs. The pressures on biosolids management include:

- Landfill Capacity – Middlepoint Landfill (Murfreesboro, TN) is a major disposal site for middle Tennessee biosolids. They are nearing capacity, and there has been public pressure to restrict expansion of the facility. This may well reduce one significant landfill option for wastewater solids from WRRFs in the region.

- Odor Concerns – There have been instances where public and media have reported odor concerns at biosolids land application sites. This has resulted in the need to increase management practices.



Notable WRRFs and Biosolids Projects

Nashville, TN's largest city (population about 693,000), has three WRRFs, Central (>100 MGD), Dry Creek (24 MGD), and Whites Creek (37.5 MGD) Sewage Treatment Plants. Solids from Whites Creek STP is pumped to the Central Biosolids Facility for treatment. There, Central and Whites Creek solids are anaerobically digested, treated with polymers, dewatered in centrifuges, and heat dried. Methane-rich biogas captured from the AD process is used to heat the digesters and the biosolids dryer. The final Class A EQ product is marketed and sold by a third party, Tycowa LLC, as "Music City Gold" fertilizer and is used in landscaping, agriculture, city parks, and more. Solids from the Dry Creek STP are anaerobically digested, dewatered, and landfill disposed.

Memphis, the second-largest city (~652,000), has two WRRFs that each treat about 75 MGD of wastewater – the M.C. Stiles and T.E. Maxson Wastewater Treatment Facilities (WWTFs). Both facilities have covered anaerobic lagoons where solids sit for ~1 year. Biogas from the lagoons is captured and sold for use or flared. After digestion, solids are dewatered and spread on a surface disposal site. In 2020, M.C. Stiles WWTF received permitting to land apply its biosolids.

In ***Knoxville***, TN's third-largest city (~186,000), the largest WRRF (Kuwahee) produces Class B anaerobically digested biosolids that are land applied by Synagro mostly on pastureland. Knoxville Utilities Board maintains a Platinum Level (highest level) certification for their biosolids program. Other WRRFs in Knoxville and West Knoxville landfill their wastewater solids.

Chattanooga, the state's fourth-largest city (~180,000), produces anaerobically digested, centrifuge dewatered Class B biosolids that are land applied on 190 farms in Tennessee and Alabama and one mine reclamation site. Chattanooga contracts with Denali Water Solutions for land application services.

Clarksville, ***Murfreesboro***, and ***Jackson***, the 5th, 6th and 8th largest cities in Tennessee, landfill their wastewater solids. ***Franklin***, the state's seventh largest city operates a 16 mgd WRRF. The plant has historically aerobically digested and landfilled its biosolids – and that's what they did in 2018. In the early 2020s, they added the first thermal hydrolysis facility in the state of Tennessee. Startup and commissioning of the facility is anticipated in Summer 2022.

Athens produces a heat-dried EQ biosolids fertilizer that is marketed and distributed as AthenaGro, available in bulk or 40 lb. bags.

Newport's WRRF treats about 4 MGD of wastewater, but has much higher solids loading (30,000 pounds BOD/day) caused by input from a local ConAgra facility. The solids are dewatered with belt filter presses and heat-dried, creating a Class A EQ fertilizer product that is provided to the public for general use in landscaping, gardening, etc.

Cookeville (~14 MGD) treats solids with two holding tanks and two two-meter belt filter presses before running them through an RDP heated, EnVessel lime stabilization process. Farmers come and haul away the resulting Class A biosolids for no cost. "While it would be cheaper to go to a landfill, we have prided ourselves to have 100% of the biosolids go to beneficial reuse." – Barry Turner, Environmental Engineer, Cookeville Wastewater Treatment Plant

Maryville (~17 MGD) produces a Class A product through the ATAD process. Biosolids are then dewatered by belt filter press and combined onsite with wood chips for composting. The final compost is available for free to individuals or for a fee to wholesalers.

Sevier Solid Waste Inc. (SSWI) owns and operates a large co-composting plant in Pigeon Forge, TN. SSWI takes in municipal solid waste (MSW) from across Sevier County, including Gatlinburg, Pigeon Forge, and Great Smoky Mountains National Park. Additional organic waste is trucked in from elsewhere in the state. MSW and biosolids are put into in-vessel containers, where any organics are composted. After three days, inorganics are screened out and sent to a Class IV landfill. The compost is placed in windrows for 28 days, and then made

available to the public. SSWI's Class A EQ compost goes to a wide variety of uses: reclamation sites, landfill final cover, home gardens, municipal parks, soil blends, and more.

There are two gasification facilities in Tennessee. These – at Covington (NE of Memphis) and Lebanon (east of Nashville) – are the first of only a few successful operating gasifiers treating wastewater solids in North America. Both are Aries Clean Energy projects constructed in the 2010s. Wastewater solids are <20% of the total gasifier feedstock mix; the majority is wood and tire chips. At Lebanon, in 2018, 10% or a bit more of the WRRF's solids were gasified, with the goal of increasing to 100% eventually. The biochar goes to a local farmer. Syngas is used at the WRRF for renewable energy.

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