



NEW JERSEY

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

This summary, a dashboard of state statistics, & further data are at www.biosolidsdata.org

In New Jersey...

- *The majority of biosolids produced are used as landfill alternative daily cover in and out of the state, which is considered a beneficial use by NJ Department of Environmental Protection.*
- *Some NJ biosolids are beneficially used as soil amendments, including compost from a few facilities (e.g. Burlington County, Cape May) and bulk biosolids from, for example, the long-standing program of the Landis Sewerage Authority, but the state's population density and limited agricultural land make it challenging.*
- *The Passaic Valley Sewerage Commission (PVSC) is a regional treatment hub, taking in solids from facilities in New Jersey and nearby states, and using a Zimpro System for treatment.*
- *Various innovative water resource recovery technologies are being installed at treatment facilities around the state, in response to aging infrastructures and new statewide restrictions.*

Biosolids Management in New Jersey

New Jersey, with high population density and much industry in some areas, disposes of most of its wastewater solids, as it has for decades. In 2018, the solids/biosolids leaving New Jersey's 237 WRRFs with greater than 20,000 gallons per day (gpd) wastewater flow totaled roughly 155,100 dry metric tons. Most were used as landfill alternative daily cover (ADC). The solids from 48 facilities went to beneficial use, including composting, heat-drying, alkaline stabilization, and land application; most of this is managed by just a few facilities that have notable, successful biosolids recycling programs (see examples below). Most biosolids that go out of state for beneficial use are used as landfill alternative daily cover.

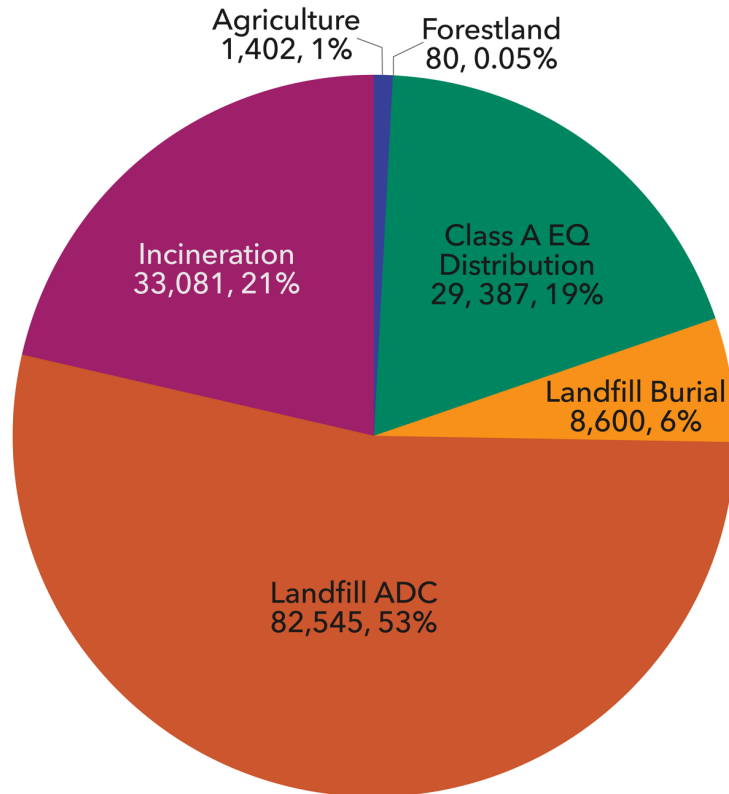
Twenty percent (20%) of NJ's wastewater solids are applied to soil. About 7% of the state's total biosolids or about 37% of those land applied goes out of state – mostly to Pennsylvania. There are a few permitted land application sites in New Jersey. There are three Class B programs and three compost facilities. In 2018, five WRRFs in NJ produced Class A EQ biosolids that are mostly not used on large-scale agriculture. Several facilities have implemented advanced energy recovery through anaerobic digestion (AD) and biogas use.

In 2018, six sewage sludge incinerators (SSIs) processed 21% of New Jersey wastewater solids: NW Bergen County in northeast NJ; Bayshore, Somerset Raritan Valley, and Stonybrook River Road near the center of the state; Atlantic City; and the Gloucester County SSI that closed in 2019. Back in 2004, there were nine operating SSIs in the state.

Only 13 out of the 237 WRRFs in the state with flow of at least 20,000 gpd manage their solids themselves; all others (including facilities with <20,000 gpd) rely on other facilities and/or contractors – about 95% of WRRFs. An estimated 90% of NJ’s biosolids are managed by private contractors. Most facilities truck sludge in liquid form, often to a larger WRRF such as Passaic Valley Sewerage Commission (PVSC). Only 48 dewater sludge before transport, even though many more have the technology (e.g. belt filter presses) to do so. This reliance of the majority of WRRFs on a few large facilities produces a challenge for WRRFs when they complete annual reports to U.S. EPA. The sludge produced at one facility might eventually become a Class A product at another facility. This complex management matrix is not unusual - the same happens in other states. New Jersey Department of Environmental Protection (NJ DEP) has cradle-to-grave tracking of all sludge produced. Every generator submits a report on either a monthly or annual basis (depending on size) indicating where their sludge is sent and how much.

New York City is an outside influence on biosolids in the region, as the city hopes to cease landfilling as part of its waste management systems and looks for places to send its biosolids for beneficial use. Pennsylvania is likewise influential, as a regional destination for biosolids, especially for land application. Forthcoming additional regulations on phosphorus (P) in several Mid-Atlantic states – including possibly Pennsylvania – could disrupt current arrangements, setting lower agronomic loading rates beyond the current nitrogen-based restrictions. About 7% of New Jersey biosolids goes to land application out of state; those management programs could be impacted.

New Jersey Biosolids Use & Disposal 2018 (dry metric tons, %) Total: 155,100



Agency/Department Oversight

NJ Department of Environmental Protection describes their biosolids regulatory program as follows:

Residual [NJ DEP's term for biosolids and similar materials] is generated by both domestic treatment plants (sewage sludge) and industrial treatment plants (industrial residual). Residual is managed in a variety of ways, including the development of Marketable Residual Products (often referred to as biosolids) used to fertilize or condition the soil. Examples include pellets, compost, alkaline materials, food processing by-products and water treatment residuals. Residual is also incinerated in New Jersey and managed in a variety of ways at out-of-state facilities. Beneficial use of residual as a fertilizer or soil conditioner is regulated under a New Jersey Pollutant Discharge Elimination System permit issued by the [Bureau of Pretreatment and Residuals](#) and may require site specific approvals, depending upon the nature of the

residual. Incineration of residual is regulated under [New Jersey's Air Pollution Control Program](#). While residual managed in other states is regulated by the receiving state, the generator must demonstrate to the Department compliance with the receiving state's law.

The Bureau of Pretreatment and Residuals also oversees the Statewide Sludge Management Plan (a component of the Statewide Solid Waste Management Plan) and reviews and approves long term generator residual management plans. Finally, through the implementation of the Sludge Quality Assurance Regulations, residual generators must test their residual and report the results to the Department on a regular basis. This data is available to assure compliance with the appropriate residual management criteria in much the same way that the surface water program uses effluent data to assure compliance with wastewater discharge requirements. (<https://www.state.nj.us/dep/dwq/sludge.htm>)

NJ DEP has relatively good records of biosolids production and quality for the last 25 years. The quality of these years of data was triggered partly by changes in management of solids/sludge/biosolids and residuals in the 1980s, as ocean disposal was phased out and there was increased regulation and tracking of solids.

NJ DEP provides an interactive map of facilities that accept wastewater solids for processing. Much of its data – which includes capacity and pollutant (metals) data – was updated in 2020. The map quickly shows which facilities offer Class A or Class B biosolids production or disposal via incineration. https://www.state.nj.us/dep/dwq/sew_sludge_mapping.htm

State Regulations and Permitting

New Jersey categorizes all sludge generators under the Sludge Quality Assurance Rule. Facilities with under 20,000 gallons daily flow are considered “exempt” from anything beyond annual reporting on quantity and destination(s) of sludge removed that year.

Biosolids end use and disposal in New Jersey is regulated through specific and general NPDES permits and/or solid waste permits. A biosolids preparer receives a NPDES permit, and specific sites receive approval for Class B land application. Land applicators and land owners can also hold legal liability for biosolids end use. For all biosolids entering from outside the state, NJ issues permit letters dictating requirements.

Beyond EPA Part 503, NJ has stricter pathogen and vector attraction reduction limits and process monitoring that is determined on a site-by-site basis. Pollutant limits are the same as

Part 503. At Class B land application sites, the state has additional restrictions on odors and requires testing of groundwater and soil to ensure that levels of nitrogen (N) and phosphorus (P) are within regulatory limits. NJ DEP requires agronomic rates be calculated based on use of the Pennsylvania Phosphorus Site Index.

Reports on biosolids are required by the state from major and minor WRRFs and from separate preparers. Annual Sewage Sludge Production by Management Mode reports are available on the state's website, back to 2006.

In 2018, NJ DEP had 8 people (6.0 FTEs) who provided parts of their time to solids management, including overseeing domestic and industrial solids management, WRRFs, food processing residuals, and biosolids. As of 2020, there were 9 people (6.7 FTEs). Tony Pilawski, long-time biosolids coordinator for NJ DEP, retires in the spring of 2021, after 37 years of service to the state and the profession.

Pressures on Biosolids Management and Land Application

Pressures on biosolids management in New Jersey as of 2018, as identified by the state's biosolids coordinator, include...

1. PUBLIC INVOLVEMENT - concerns of neighbors, environmental groups, and others
2. REGULATIONS ON BENEFICIAL USE - lack of regulatory support for beneficial use
3. MANAGEMENT ISSUES - the hassle of biosolids recycling/land application
4. COST - disposal options are least expensive
5. AGRICULTURAL ISSUES - declining farmland due to less agriculture or due to development, sprawl, seasonal restrictions, or competition with manures, etc.

As of 2018, the beneficial use of biosolids was not increasing in New Jersey. A new NJ DEP report (in draft) notes:

Although it is the Department's stated policy to encourage beneficial use alternatives, it must be recognized that a policy that also encourages management alternatives that rely less heavily on large areas of land is necessary in our State. For calendar year 2011, only about 12 percent of New Jersey's sewage sludge production was prepared for in-state land application.... About thirty-eight percent of the State's sewage sludge production was transported out-of-state in 2011. ...[T]here were eighteen permitted sewage sludge operations remaining in New Jersey by the year 2014. This is a decrease from 1987 when there were twenty-six permitted land-based sewage sludge management operations in the State

[including 10 incinerators, 10 Class B operations, and 6 Class A operations]. In addition, New Jersey is dealing with aging sewage sludge management infrastructure. A new customer-based sewage sludge management alternative has not been implemented within the last decade. It is worth noting that prior to 1991 over fifty percent of New Jersey's sewage sludge production was disposed in the Atlantic Ocean.

As of 2020, beneficial use seems to be increasing for the first time in decades, as several new beneficial use projects are in the midst of construction and permitting.

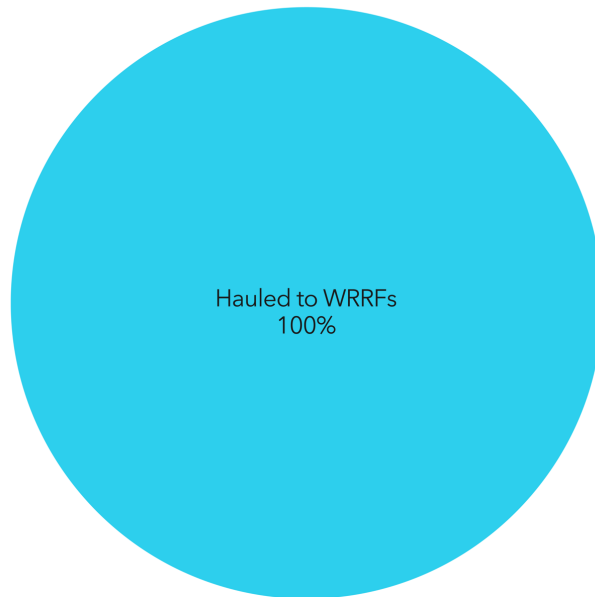
However, public pressure is also increasing, partly because of the recent passage of a landmark state environmental justice law designed to protect “overburdened communities”¹ from pollutants. This new law requires the NJ DEP to evaluate the impact on overburdened communities when reviewing permit applications for resource recovery facilities, incinerators, sludge processing facilities, WRRFs with greater than 50 MGD capacity, and landfills, among other waste-related facilities and potential sources of air pollution. PFAS is also an increasing pressure on biosolids management, as of 2020, as the state works toward setting PFAS groundwater and other limits. New Jersey already has very strict regulations for land application of biosolids, designed to control odors, pollutants, and nutrients, contributing to the difficulty and cost of recycling biosolids.

Septage Management

An estimated 25 septage haulers operate in the state, and roughly the same number of WRRFs accept septage, though it is not required by the state that they do so. Septage can be land applied in New Jersey, as long as it meets Part 503 and the state's Class B standards. As of 2018, all of NJ's septage goes to WRRFs. Other residuals accepted by WRRFs include food and beverage processing wastes, fats, oils, and grease (FOG), and sludge/solids from other WRRFs. FOG is considered a significant issue in NJ, and it is regulated by wastewater permits/regulations.

¹ “Overburdened communities” are defined as communities in which “35 percent of the households qualify as low-income according to the U.S. Census, 40 percent of households are minority, or 40 percent of households have limited English proficiency.” <https://www.nj.gov/governor/news/news/562020/20200918a.shtml>

New Jersey Septage Management 2018
(% estimated)



New Jersey Septage Management

Septage haulers based in the state	25
Separate preparers (not WRRFs) taking septage in the state	0
WRRFs required to take septage?	No
WRRFs accepting septage in the state	25
Septage received in 2018 (gallons)	189,000,000
Other outside wastes accepted at WRRFs, type & gallons	4,500,000 gallons of food & beverage processing waste, 6,000,000 gals. FOG, and 56,800 dmt sludge from smaller WRRFs
Is FOG considered a significant issue? Is it regulated / how?	Yes In wastewater permits & regulations
Is there a proactive program to collect FOG?	No
Most recent septage regulations update	1998
FTEs at state agency for septage	<1

Major WRRFs, Separate Preparers, and Notable Projects

- Passaic Valley Sewerage Commission (PVSC) takes sludge from a large percentage of New Jersey WRRFs, as well as from out of state (including from New York City and Connecticut). PVSC uses a Zimpro system, a thermal sludge treatment process that is a remnant of the days when PVSC took in significant toxic waste and needed to ensure it would be adequately oxidized. This process produces a 40% solids product that could potentially meet Class A EQ standards, but is not registered with the state because it all goes to landfill alternative daily cover (ADC), much of it out of state, through a contract with Synagro (EPIC). ADC has long been considered by NJ DEP to be a “beneficial use” of biosolids. A 1985 law restricts (to emergency circumstances only) the landfilling of sewage sludge for disposal. When Hurricane Sandy took PVSC out of commission in 2012, it caused a big problem for the whole region, due to the size and scope of PVSC’s wastewater solids management operations.
- The Delaware No. 1 Water Pollution Control Facility (WPCF) is operated by Camden County Municipal Utilities Authority (CCMUA). Just across the Delaware River from Philadelphia, this WPCF sends its dried sludge either for use as landfill ADC or to replace coal as fuel at a cement kiln. CCMUA has been Platinum-Certified by the National Biosolids Partnership since 2010.
- Gloucester County Utility Authority outside Philadelphia closed its incinerator in 2019, put in anaerobic digesters, and is experimenting with drying processes. Its biosolids currently go to ADC at the Gloucester County Landfill.
- Middlesex County Utilities Authority (MCUA) has an N-Viro biosolids treatment systems that has been modified but is still based on alkaline stabilization. It produces “Meadow Life” EQ biosolids that were used for landfill ADC at the landfill across the street. Malodors associated with this EQ biosolids made land application difficult. That was in 2018. As of 2020, Denali Water provides back-up during maintenance and sends the biosolids to mine reclamation out of state. The MCUA biosolids are produced either from dewatered “cake” or from heat-dried material. In either case, they are treated with the alkaline process. The heat dryer used is a horizontal thin film dryer (Buss Dryer).
- Ocean County makes a pelleted product sold as a nitrogen fertilizer called OceanGro.

- WeCare Denali currently operates the biosolids composting facility for Burlington County. The agitated bay in-vessel composting operation was completed in 1998 in a public/private partnership.
- Cape May County Municipal Utilities Authority has operated a biosolids composting facility since 1985, taking in solids from four service areas (Cape May, Ocean City, Seven Mile Beach-Middle, Wildwood Lower) that comprise most of 14 of the County's 16 towns. The facility's EQ product is called CapeOrganic. In 2016, after suffering a bad fire, the composting facility temporarily switched to being a sludge transfer facility.
- The Landis Sewerage Authority (LSA) operates a WRRF and land application facility in Vineland, NJ. It uses anaerobic digestion to produce biosolids for beneficial use on 380 acres of agricultural land owned by LSA, either through subsurface injection or surface application. FOG, pancake batter, Campbells Soup waste, and other food waste are accepted for co-digestion. The facility is powered by biogas from AD, a large solar array, and a wind turbine.
- Ridgewood's WRRF implemented co-digestion in 2013, taking in FOG and reclaiming the biogas to power the plant (with the help of solar panels). Its solids go to PVSC.
- Rahway Valley Sewerage Authority (RVSA) processes its solids with AD, and biogas is recovered to offset 25% of the facility's power costs through a combined heat and power (CHP) system. RVSA has a robust public outreach program, offering regular tours. It also receives slurried food waste from a Waste Management transfer station.
- New Jersey still has four reed beds for slowly treating and storing solids/sludge; all will have to be cleaned out someday, according to NJ DEP regulations.

As of 2020, there are three new biosolids facilities in the works, after there being no new facilities built for over two decades:

- In Deerfield Township, Synagro has applied for a permit for a 70-dry-tons-per-day compost facility. However, as of fall 2020, the facility is receiving some public pushback, partly due to the fact that Deerfield Township is an "overburdened community" (see regulatory discussion above).

- In Linden, Aries Clean Energy is building a sludge gasifier. The project is supposed to be completed in 2021, with no significant setbacks or slowdowns due to the COVID-19 pandemic. Linden is an industrial city, one of NJ's most polluted, and the new Aries gasifier is just one of many development projects currently underway to clean up and revitalize the area.
- Aries is also applying for permits to build a similar gasifier in Newark, demonstrating confidence in their system.

References

The state biosolids coordinator and other state biosolids experts provided most of the information in this summary report. Additional information was obtained from:

Aries Clean Technologies:

https://ariescleanenergy.com/case_studies/bringing-clean-sustainable-biosolids-gasification-to-new-jersey/

BioCycle:

<https://www.biocycle.net/codigestion-water-resource-recovery-facilities/>

Buss-SMS-Canzler:

<https://www.sms-vt.com/technologies/drying-technology/horizontal-thin-film-dryer/>

Cape May County Municipal Utilities Authority:

<https://www.cmcmua.com/wastewater-management-program>

<https://www.cmcmua.com/compost>

Landis Sewerage Authority:

<http://landissewerageauthority.com/Overview.html>

Middlesex County Utilities Authority:

<https://www.mcu.com/wastewater-division/meadow-life/>

My Central Jersey:

<https://www.mycentraljersey.com/story/news/local/development/2018/07/20/linden-redevelopment-new-business-real-estate/787222002/>

Natural Systems Utilities:

<https://www.nsuwater.com/village-of-ridgewood-wastewater-treatment-plant-now-fully-operational-and-producing-renewable-energy/>

New Jersey state government:

<https://www.nj.gov/pvsc/>

<https://www.nj.gov/governor/news/news/562020/20200918a.shtml>

Ocean Country Utilities Authority:

<http://www.ocua.com/OceanGro/SitePages/Home.aspx>

The Philadelphia Inquirer:

<https://www.inquirer.com/science/climate/solar-wind-power-environment-sewage-vineland-south-jersey-20190212.html>

Rahway Valley Sewerage Authority:

<https://www.rahwayvalleysa.com/>

Sussex County Municipal Utilities Authority:

<https://www.scmua.org/Cit-e-Access/webpage.cfm?TID=121&TPID=11906>

Township of Parsippany-Troy Hills:

<http://www.parsippany.net/206/Sanitary-Sewer-Utility>

Waste Management World:

<https://dpw.lacounty.gov/epd/socalconversion/PDFS/AriesCleanEnergy-Gasification.pdf>

WeCare Compost:

<http://www.wecarecompost.com/wecare-products/locations/burlington-county-nj/>