



ILLINOIS

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

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

In Illinois...

- *An estimated 75% of Illinois wastewater solids are applied to soils, and about 20% are placed in landfills or surface disposal sites.*
- *Agricultural land is abundant and close to a large number of water resource recovery facilities (WRRFs), allowing for many programs to cost-effectively inject liquid Class B biosolids in farm soils. Still, most biosolids are land applied as dewatered cake.*
- *Chicago dominates solids production and management in the state, including demonstrating and leading diverse biosolids management options: Class B land application for agriculture and long-term drying, composting, and pelletization to produce various Class A products for urban and suburban uses.*

Biosolids Management in Illinois

Agriculture is a major part of the Illinois economy. Statewide there is a high rate of biosolids recycling, most as injected liquid or dewatered cake Class B biosolids applied to fertilize mostly corn (mostly for ethanol and animal feed), soy, wheat, and hay (for animal feed; Illinois is also a major producer of pork, beef, dairy, and sheep). The 190 dt solids use or disposal events reported to the U.S. EPA biosolids electronic reporting system for 2018 (as accessed via ECHO) show that ~93% of the state's finished biosolids were applied to land as Class B or Class A. Minor amounts were used for landfill capping or went to landfills or surface disposal. There are no sewage sludge incinerators operating in Illinois.

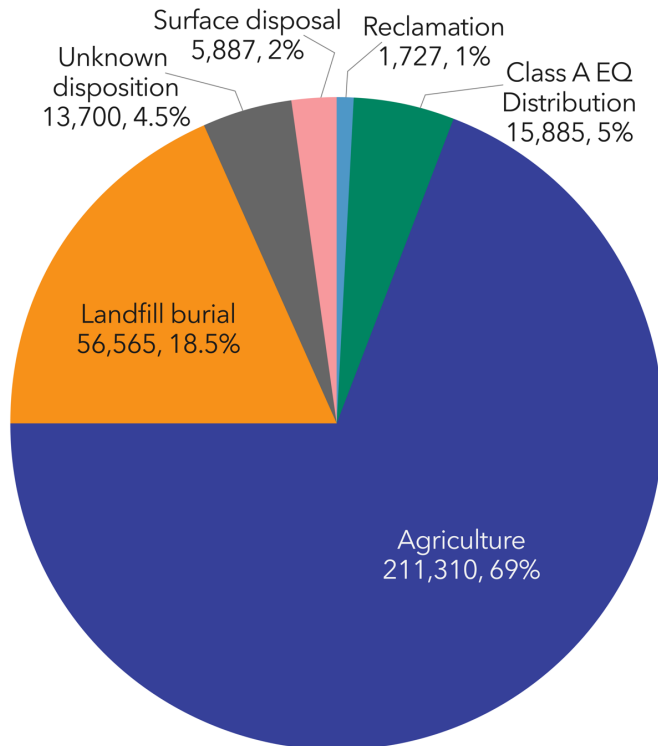
Wastewater in the greater Chicago area is managed by one large utility, the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). In 2018, 99% percent of MWRDGC biosolids were recycled to soils; just 1% of off-spec material was disposed of in a landfill. Chicago accounts for 1/3 of the estimated 305,000 dry U.S. tons (dt) of solids used or disposed of in Illinois in 2018. Note that an additional 28,000 dt of solids were produced and reported, mostly from MWRDGC, but they went into storage and thus are not part of the total that was used or disposed in 2018.

A unique feature of MWRDGC's biosolids program is storage in lagoons for approximately two years followed by drying to produce a Class A product. Some other Illinois biosolids are also produced this way (e.g. at Downers Grove). See below for details on Chicago's long-standing, diverse, and effective biosolids recycling program.

There are few separate preparers treating biosolids in Illinois; the Chicago Metropolitan Biosolids Management/Veolia heat-drying facility is the only major one. But there are several private contractors that perform the land application of liquid and dewatered biosolids, including local companies (e.g. Stewart Spreading) and nationwide companies (e.g. Synagro, Merrell Brothers). Also,

as happens across the nation, private companies are sometimes contracted to operate entire municipal wastewater treatment systems, including their biosolids management.

Illinois Biosolids Use & Disposal 2018 (dry US tons, %) Total: 305,000



Agency/Department Oversight, Regulations, and Permitting

The Illinois Environmental Protection Agency (IL EPA) oversees biosolids management in conjunction with the federal U.S. EPA Part 503 biosolids rule. IL EPA regulations impose additional requirements for Class B land application, as do regulations in many other states. These requirements include setbacks from surface waters and groundwater, slope restrictions, nutrient management, and more.

Illinois is unique in having encouragement from the legislature for production and use of Class A EQ biosolids. Because the Illinois biosolids regulations pre-date the Part 503 rule, and therefore did not adopt the Class A EQ standards, stakeholders worked with legislators and, "In 2015, the Illinois General Assembly amended the Illinois Environmental Protection Act to adopt the USEPA EQ classification in the state and recognize biosolids as a safe, beneficial, and renewable resource. This

Discrepancies with ECHO Data

Illinois biosolids data provide an example of the difference between solids *produced* and solids *used or disposed*. This NBDP project strives to compile and report the latter.

Because IL biosolids managers did so well in completing the required U.S. EPA electronic reporting process for 2018 data (158 submitted the required data online), the difference between solids *produced* and solids *used or disposed* is evident (in dry U.S. tons, or dt, using only ECHO data):

Total IL solids produced: 289,819 dt
Total solids used/disposed: 263,713 dt
 = 26,106 dt

Almost all of the 26,106 dt difference is attributable to *storage* of Chicago biosolids. In its 2018 Annual Biosolids Report, the Chicago utility shows:
 Total solids produced: 179,940 dt
Minus solids produced that went to another treatment facility: 53,988 dt
Equals finished biosolids: 125,952 dt
 100,282 dt were used or disposed
 25,670 dt were stored.

This NBDP project tallies biosolids used or disposed, *not* solids produced.

legislative change eased state regulations that were stricter than federal restrictions on the use of EQ biosolids...” (MWRDGC, 2019).

Septage is regulated by the IL Department of Public Health and local counties.

Pressures on Biosolids Management and Land Application

Pressures on biosolids in IL as of 2018 include the following, which were selections by the state coordinator from a preset list in the NBDP state survey:

1. TRADITION – WRRF management doesn't care where it goes, just contracts to make it go away.
2. TRADITION – it's difficult to change from long-standing practices or existing and known infrastructure.
3. PUBLIC INVOLVEMENT – concerns of neighbors, environmental groups, and others.

As of 2018, the beneficial use of biosolids was staying about the same as in recent years. Since 2004, it appears that beneficial use has increased by about 17% and there is more Class A biosolids being produced – an increase of 35% percentage points since 2004, replacing Class B production.

Septage Management

The NBDP estimates that 20% of Illinois residents and small businesses rely on onsite wastewater systems (septic systems) for wastewater treatment. Septage can be land applied in Illinois, and about 20% of Illinois septage goes to land application, according to the IL Department of Public Health. Often, septage haulers treat septage by alkaline stabilization and land apply it directly, in accordance with federal requirements at 40 CFR Part 503. The remainder (80%) is discharged at WRRFs. See Table 1 for more information.

Illinois Septage Management 2018
(% estimated)
Total: 87,687,500 gallons

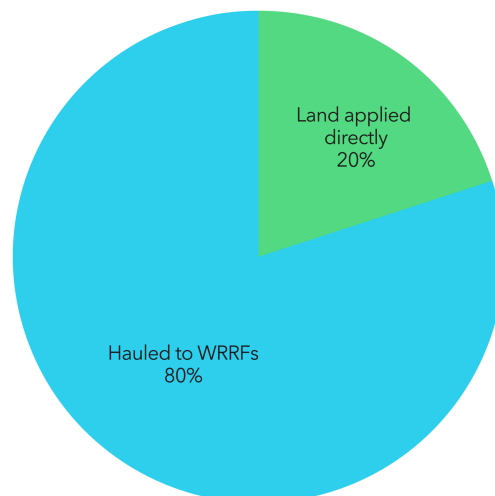


Table 1. Illinois Septage Management

Quality of state septage data	Moderate
Septage haulers based in state:	496
In-state separate preparers (not WRRFs) taking septage:	0
WRRFs required to take septage?	No
WRRFs that accept septage:	many
Septage received at WRRFs in 2018 (gallons):	69,799,048
Other outside wastes accepted at WRRFs:	no data
Is fats/oil/grease (FOG) a significant issue?	no data
Is it regulated?	some, at county or local level
How?	no data
Is there a proactive program to collect FOG?	no
Can septage be land applied in state?	Yes
If yes, what treatment is required?	Meet Part 503
Most recent septage regulations update:	The Private Sewage Disposal Code was last updated August 2013.
Full-time equivalent (FTE) at state agency for septage:	0
Notes:	
In the State of Illinois disposal of septage from a private sewage disposal system for CY2018: Land applied in gallons - 17,888,460 Municipal facilities in gallons - 69,799,048 Total gallons of septage disposed of in the State of Illinois - 87,687,508	

Major WRRFs and Notable Projects (in order by decreasing WRRF size)

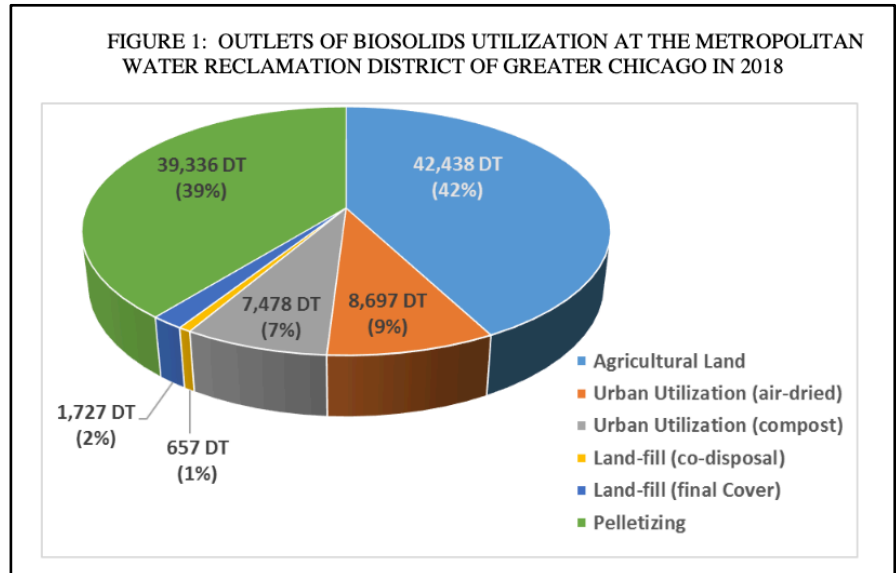
- Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)** owns and operates one of the largest wastewater operations in the world, treating more than 1.3 billion gallons (1,300 MGD) on average each day. The District’s annual biosolids report for 2018 explains its biosolids program:

The District operates seven water reclamation plants (WRP), namely Stickney, Calumet, Terrence J. O’Brien (O’Brien), John E. Egan (Egan), Hanover Park, James C. Kirie (Kirie), and Lemont WRPs. Four WRPs, Stickney, Calumet, Egan, and Hanover Park, produce final biosolids products. Under normal operations, the untreated sludge generated at the Kirie WRP is sent to the Egan WRP, and sludge from the O’Brien and Lemont WRPs are sent to the Stickney WRP for processing into final products. The processing of biosolids at the four WRPs that generate final biosolids products includes anaerobic digestion for over 15 days of detention time at 35°C to meet the 40 CFR Part 503 Class B pathogen reduction requirements. The metal concentrations in all biosolids produced at the District are well below the pollutant concentration limits established in Table 3 of Part 503.13(b)(3). The additional processing to achieve the final products varies between the four

WRPs as indicated in the description of the biosolids products outlined below.

- **Dewatered Class B Biosolids:** These biosolids are produced primarily by centrifugation of anaerobically digested liquid biosolids (~5 percent solids content) to approximately 25 percent solids content.

Alternatively, the anaerobically digested biosolids are stored temporarily in lagoons then placed on drying beds for partial drying (>20 percent solids content) through mechanical



agitation before use. This product is produced at the Stickney, Calumet, and Egan (centrifuged biosolids only) WRPs and commonly applied to farmland as a fertilizer.

- **Air-dried Exceptional Quality Biosolids:** These biosolids are produced through the aging of centrifuge cake biosolids or digested sludge in lagoons for at least 1.5 years followed by air-drying to at least 65 percent solids content. This air-dried material meets the “Exceptional Quality” (EQ) standards... This product is produced at the Stickney and Calumet WRPs, and since the early 1990’s, it has been used under a Controlled Solids Distribution program as a fertilizer or soil amendment on areas such as recreational fields and golf courses and for reclamation of urban soils. The material is currently voluntarily registered as a soil amendment with the Illinois Department of Agriculture... [Some is occasionally applied to farmland similarly to the Class B program described above. In addition, the lagoon-aged air-dried biosolids are used for establishing final vegetative layer on landfills through an Adjusted Standard issued by the Illinois Pollution Control Board.]

- **Exceptional Quality Composted Biosolids:** The composted biosolids are produced at the Stickney WRP Harlem Avenue Solids Management Area and at the Calumet East Solids Management Area under permits issued by the Illinois Environmental Protection Agency (IEPA) Bureau of Land and according to operational standards of the Federal 40 CFR Part 503... The composting recipe consists of one part centrifuge cake biosolids and three parts woodchips. The composting process used is open windrow composting for a minimum of 23 days, a minimum of five turnings, temperature maintained at a minimum of 55 °C, and then followed by 16 weeks of curing. The product produced is currently voluntarily registered as a soil amendment

with the Illinois Department of Agriculture.

- **Liquid Biosolids:** The digested biosolids produced at the Hanover Park WRP are stored and thickened (~5 percent solids content) in lagoons on the grounds of the Hanover Park WRP. This material meets the 40 CFR Part 503 Class B pathogen requirements and is applied through a subsurface injection at the on-site Fischer Farm as a fertilizer for crops, mainly corn. The Fisher Farm has an underdrain system that returns drainage from the fields back to the WRP.
- **Biosolids Pellets:** The product is produced by heat-drying at a Pelletizer facility located at the Stickney WRP that is owned and operated by Metropolitan Biosolids Management, LLC (MBM), a subsidiary of Veolia Water North America. The operation generates small fertilizer pellets that meet Class A, exceptional quality (EQ) biosolids with a solids content greater than 90 percent [which are marketed by MBM and used as fertilizer on area agricultural land and sold to fertilizer blending businesses].

The District's Biosolids Management Program is designed to manage all the biosolids for beneficial reuse. During 2018, only 1 percent biosolids which were unsuitable for land application was co-disposed in municipal landfills... [In 2018, this was the Waste Management Laraway Landfill in Joliet, IL.] The unsuitable materials generally contain gravel, wood debris, and dust from sweeping of roads at biosolids drying sites. There are four main outlets for the beneficial utilization of District biosolids:

- (1) **Farmland Application:** Dewatered Class B biosolids are utilized as a fertilizer for the production of row crops in nearby counties in Illinois. Under this program, land application companies are contracted by the District through the competitive bidding process to enroll farmers in the program and to haul and apply the biosolids to the farm fields... District oversight is done by: (1) requiring the land application contractor to comply with hauling and field operation specifications and execute a Public Relations Program, and (2) District staff who conduct additional activities to complement the activities of the contractors.
- (2) **Urban Utilization of air-dried and composted biosolids:** The EQ air-dried and composted biosolids are applied to public lands (e.g., parks, golf courses, and athletic fields) and residential properties within the District's service area. The air-dried biosolids are typically used as topdressing on established turfgrass or blended into topsoil as a soil amendment. The composted biosolids are typically applied to land as a soil amendment or as mulch in planter beds.
- (3) **Hanover Park Utilization Program:** The liquid biosolids are stored and thickened in lagoons and are utilized as fertilizer for application to farmland by a subsurface injection at the Fischer Farm located at the Hanover Park WRP. The supernatant from the settling of the biosolids, and the settled biosolids are injected separately.
- (4) **Landfill Final Cover:** [In 2018,] a total of 1,727 DT of biosolids generated at the Calumet WRP was applied as final cover at the Land and Lakes Landfill, Dolton, Illinois.

- *MWRDGC 2018 Annual Biosolids Report*

The following WRRF biosolids programs are examples of typical mid-size and smaller systems in Illinois:

- **Decatur** treats about 34 MGD of wastewater from a population of about 100,000. The solids are stabilized with anaerobic digestion and stored in lagoons. Each fall, these Class B biosolids are pumped out of the lagoon, trucked, and land applied by liquid injection into the soils of area farms.
- **Rockford's** water reclamation district (formerly Rock River Water Reclamation District) changed its name to Four Rivers Sanitation Authority in 2021. It treats 40 MGD and processes ~11,000 tons of solids each year using anaerobic digestion. The biosolids are land applied on area farms. Biogas is used for electricity, providing about 70% of the WRRF's required power.
- **Peoria** land applied 9,700 dry U.S. tons of Class B biosolids in 2018. Their average annual tonnage is ~8,000 dt applied to ~430 acres of farmland not far from the WRRF.
- **Sauget's** American Bottoms WRRF treats about 25 MGD. Solids are thickened to 8% solids and dewatered with a belt filter press before being landfilled.
- **Oswego's** Fox Metro Water Reclamation District underwent a major expansion at its South Plant, completed in 2019, allowing up to 42 MGD of treatment. The resulting biosolids are land applied on area farm fields.
- **Springfield** expanded its Spring Creek treatment plant in the early 2010s, adding biological nutrient removal (BNR).
- **Kankakee** land applied about 2,500 dry U.S. tons of Class B biosolids by liquid injection on about 350 acres of farmland in 2018.
- **Downers Grove** has an 8 MGD facility that treats solids with anaerobic digestion and uses the biogas to produce electricity and process heat. The solids are dewatered with belt filter presses and then air dried in long-term storage, similar to Chicago's process, producing Class A biosolids that are given away throughout the community.

References

Some of the data and information contained herein were kindly provided by IL EPA and IL Department of Health. Additional sources include:

MWRDGC:

MWRDGC, 2019. 2018 Annual Biosolids Report, <https://mwrdd.org/sites/default/files/documents/19-26%20Annual%20Biosolids%20Report%20for%202018.pdf>

MBM/Veolia facility:

<https://www.veolianoorthamerica.com/case-studies/upgrading-biosolids-management-chicago>

Danville:

https://www.news-gazette.com/news/district-shows-off-biogas-to-energy-system/article_2ab05925-4da2-5991-bc47-486bc5d0add8.html

Decatur:

<https://sddcleanwater.org/departments/operations/>

Downers Grove:

<https://www.dgsd.org/biosolids/>

Kishwaukee:

<https://www.kishwrd.com/the-sewer-plant/biosolids>

Rockford/Four Rivers Sanitation Authority:

<https://www.mystateline.com/news/rock-river-water-reclamation-district-changes-its-name/>

Biosolids management in Illinois:

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

<https://www.amwater.com/ilaw/news-community/illinois-american-water-news-drop/>