

Delaware

WWTP Totals

	2004 Data	2018 Data	
Total Number of WWTPs:	6 (survey), 19 CWNS	33	33
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	0	3	-----
Total number of your state's WWTPs sending to those Separate Preparers:	0	0	-----
Number of operating sludge incinerators in your state (total):	0	0	-----
Fluidized bed:	0	0	-----
Multiple hearth:	0	0	-----
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004	3	-----
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	6	-----
Number of WWTPs in your state with <i>sludge</i> lagoons:	data not requested for 2004	5	-----
Wastewater Flow Totals			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	107.25	-----
Total statewide WWTP <i>design</i> capacity for wastewater flow (MGD):	data not requested for 2004	192.69	-----
Total statewide average daily <i>dry weather</i> flow (MGD):	data not requested for 2004	no data	-----
Other Totals			
Number of documented odor & nuisance complaints received by state in 2018 related to biosolids transportation and use or disposal outside of the gates of the WWTP:	data not requested for 2004	1	-----
Number of WWTPs involved in those complaints:	data not requested for 2004	1	-----
Percent of population served by on-site systems (e.g. septic systems):	30%	25%	-----

Most of Delaware's sanitary waste is treated by 21 WWTPs with NPDES surface water discharge permits and 12 WWTPs that use their effluent for spray irrigation. Several of these plants discharge into larger plants or their sludge is processed by larger plants. • The "total statewide average daily flow" was only available for the 21 NPDES WWTPs; there are no available data for the 12 spray irrigation WWTPs. The estimate here is based on the ratio of the design capacity for the NPDES WWTPs and the spray irrigation WWTPs: NPDES = 181,232,600, Spray Irrigation = 11,453,836, or approximately 6% of the total design capacity is for spray irrigation WWTPs. The NPDES statewide actual flow was 100,276,000 GPD. • The daily dry weather flow is not readily available. • The percent of population served by on-site systems is an estimate.

Biosolids Use and Disposal

UNITS:	Dry metric tons	Dry U.S. tons	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total): 27,900			
Summary			
	Number of Entities (WWTPs & Sep. Preparers) Going To...	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To... Quantity of Biosolids
Beneficial Use (applied to soils, not including ADC)	6	21,000	6 22,580
Disposal & Alternative Dispositions	0	0	7 5,250
Other	0	0	0 0
TOTAL	6	21,000	13 27,830
Beneficial Use			
	Sep. Preparers) Going To...	Quantity of Biosolids	Sep. Preparers) Going To... Quantity of Biosolids
Agricultural (EQ, Class A, & Class B)	3	8,500	3 10,785
Forestland (EQ, Class A, & Class B)	1	1,000	1 0
Reclamation (EQ, Class A, & Class B)	1	10,000	0 0
Class A EQ Distribution (bagged or bulk, public distribution, or unsure where it went)	1	1,500	3 11,795
Beneficial Use Subtotal	6	21,000	7 22,580
Long-term storage	0	0	no data no data
Number of acres to which biosolids were applied:	4,224		no data
Disposal & Alternative Dispositions			
	Number of Entities (WWTPs & Sep. Preparers) Going To...	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To... Quantity of Biosolids
Landfill (total)	0	0	7 5,250

NOTE: Quantity of sewage sludge or biosolids used or disposed means the quantity that goes out the gate of the WWTPs. Use the units (the form of measurement) you chose above.

There are 7 separate preparers, but one - Mountaire (Millsboro) is a chicken plant that has a WWTP that processes only a small quantity of sanitary waste. They have a land application permit for forested land and cultivated fields, but they did not land apply any biosolids in 2018. Therefore, the total number of beneficial use entities for 2018 is shown as 6 (subtracting the chicken plant, as all of their solids went to a landfill in 2018). • The number of acres shown here, to which biosolids were applied, is only for Class B (and most of the 10,785 tons went to Pennsylvania, including all of Wilmington's. Only 290 dry tons were applied in DE (City of Rehoboth 235 dry tons and Sussex County 55 dry tons). The number of acres of land EQ biosolids were applied onto is unknown. • DNREC does not keep track of the tons of long term storage in Delaware.

Burial	data not requested for 2004	data not requested for 2004	7	5,250
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004	0	0
Surface Disposal	0	0	0	0
Incineration	0	0	0	0
Cement kiln or industrial furnace	data not requested for 2004	data not requested for 2004	0	0
Deep well injection	data not requested for 2004	data not requested for 2004	0	0
Gasification	data not requested for 2004	data not requested for 2004	0	0
Pyrolysis	data not requested for 2004	data not requested for 2004	0	0
Disposal & Alternative Dispositions Subtotal	-	-	7	5,250
TOTAL	6	21,000	14	27,830

Biosolids Quality Summary

	Number of Entities (WWTPs & Sep. Preparers) Producing...	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Producing...	Quantity of Biosolids	NOTE: For "number of entities," the total may not match because some entities go to more than one use or disposal.
Class A EQ	6	21,000	3	11,795	
Other Class A	0	0	0	0	
Class B	0	0	3	10,785	
Other (no data, etc.)	0	0	7	5,250	
TOTAL	6	21,000	13	27,830	

Biosolids Treatment Practices

	Estimated Number of WWTPs or Separate Preparers Using...	Estimated Quantity of Biosolids Produced Using...	Estimated Number of WWTPs or Separate Preparers Using...	Estimated Quantity of Biosolids Produced Using...	The Class B lime stabilized product included here is septage. • In this table, "Heat drying" includes heat drying and pasteurization systems. • The "aerobic digestion" data is for the City or Rehoboth (235 tons that is land applied). Data are not available for other aerobic digestion WWTPs, because their biosolids are not land applied nor tracked as closely. • For WWTPs that digest and then make Class A biosolids, only the Class A process is listed here. • The "other technology" is for Milton's "Clairgestar" and the private Perdue facility's "Sequential Batch Reactor" and the quantity is an estimate. • The gravity thickener is for City of Rehoboth.
Stabilization					
Aerobic Digestion (total)	6	no data	3	521	
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004	0	0	
Class B	data not requested for 2004	data not requested for 2004	3	521	
Anaerobic digestion (AD) (total)	0	no data	0	0	
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004	0	0	
Class B (mesophilic)	data not requested for 2004	data not requested for 2004	1	no data	
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004	0	N/A	
Biogas used (heating, electricity, fuel, etc.;scf/year)	data not requested for 2004	data not requested for 2004	0	N/A	
Lime/Alkaline (total)	1	no data	2	102	
Class A lime/alkaline	data not requested for 2004	data not requested for 2004	0	0	
Class B lime/alkaline	data not requested for 2004	data not requested for 2004	2	102	
Composting	1	no data	1	327	
Thermal (e.g. heat drying, not incineration/gasification/pyroly)	0	no data	2	11,468	
Gasification	data not requested for 2004	data not requested for 2004	0	0	
Pyrolysis	data not requested for 2004	data not requested for 2004	0	0	
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004	0	N/A	
Long-term (lagoons, reed beds, etc.)	2	no data	0	N/A	
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004	0	N/A	
Other stabilization technology	0	no data	2	282	
Dewatering					
Belt Filter Press	7	no data	7	14,595	
Plate & Frame Press	0	no data	0	0	
Screw Press	0	no data	0	0	
Centrifuge	0	no data	2	10,524	
Vacuum Filter	0	no data	0	0	
Drying beds (open-air)	3	no data	2	586	
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004	0	0	
Other dewatering technology	0	no data	0	0	
Thickening					
Gravity thickener	data not requested for 2004	data not requested for 2004	1	235	
Gravity belt thickener (GBT)	data not requested for 2004	data not requested for 2004	0	0	
Centrifuge	data not requested for 2004	data not requested for 2004	0	0	
Dissolved air flotation (DAF)	data not requested for 2004	data not requested for 2004	0	0	
Other thickening technology	data not requested for 2004	data not requested for 2004	0	0	
Other					
Biosolids sold in bags (explain at right what size bags)	data not requested for 2004	data not requested for 2004	0	0	

State Pollutant (trace metal, etc.) Concentration Limits in Biosolids Applied to Land, 2018

Enter numbers only where state limits differed in 2018 from U.S. EPA limits.

	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Zinc (Zn)
EPA Table 1 (mg/kg)	75	85		4300	840	57	75	420	100	7500
EPA Table 3 (mg/kg) & CPLR (kg/ha)	41	39		1500	300	17		420	36 (CPLR = 100)	2800
State ceiling limit (higher limit) (mg/kg)	75	85	3000	4300	840	57	75	420	100	7500
State high quality (lower number) limit (mg/kg)	41	39	1200	1500	300	17	18	420	36	2800
State CPLR (kg/ha)	41	39	3000	1500	300	17	18	420	100	2800
State APLR (kg/ha/365days)	2	2	150	75	15	1	1	21	5	140

TESTING

For each of the following constituents, indicate if testing is required by your state, as of 2018.	Is testing required for all sewage sludge or biosolids?	Or is testing required only for biosolids being beneficially used as fertilizers and soil amendments?	Frequency of testing (indicate how often testing must be done for each parameter):		If frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	In accordance with other frequency required by state (if applicable, please specify)	
Part 503 metals (As, Cu, Hg, etc.)	no	yes	yes		
Other metals (boron, silver...)	no	yes	not applicable (N/A)		
Dioxins/furans	no	yes	not applicable (N/A)		
PCBs	no	yes	no		See notes, right.
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf)	no	yes	no		Typically once every 3 years
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	no	not applicable (N/A)		
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	no	no		
Nutrients (NPK)	yes	yes	yes		Varies
Pathogen reduction (Class A or B)	no	yes	yes		
Vector attraction reduction (VAR)	no	yes	yes		
PFAS (as of 2018)	no	no	not applicable (N/A)		
Microplastics (as of 2018)	no	no	not applicable (N/A)		
TCLP (toxicity characteristic leaching procedure)	no	yes	not applicable (N/A)		
Paint Filter Liquids Test	no	no	not applicable (N/A)		Only for landfilled solids

CPLR and APLR above - some numbers are rounded due to how this spreadsheet is set up. • Delaware requires testing for the original 10 503 metals. • Testing for PCBs: DNREQ requires some more frequent testing; for Wilmington, every 2 months; for Kent City, ever month; and for Seaford, quarterly. • TCLP is required for new sludge sources that are going to be land applied prior to permit issuance. • TCLP and paint filter test are required for sludge going to a landfill.

REPORTING

For each of the following, indicate what WWTPs and/or biosolids preparers must report to the state:	Is reporting to the state required for these parameters?	Frequency of reporting (indicate how often testing must be done for each parameter):		How are these data stored by the state?	Are data compiled by the state in reports or summaries? Is so, please attach.
		In accordance with Part 503 requirements	In accordance with other frequency required (if applicable, please specify)		
The amounts of biosolids/ sewage sludge used or disposed	yes	yes		paper	yes
Part 503 metals (As, Cu, Hg, etc.)	yes	yes		electronic	yes
Other metals (boron, silver...)	no	not applicable (N/A)		not applicable (N/A)	no
Dioxins/furans	yes	not applicable (N/A)		electronic	yes
PCBs	yes	yes		electronic	yes
Priority pollutants	yes	not applicable (N/A)		electronic	yes
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	not applicable (N/A)		not applicable (N/A)	no
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	not applicable (N/A)		not applicable (N/A)	no
Nutrients (NPK)	yes	no		electronic	yes
Cumulative Pollutant Loading Rates (CPLR)	yes	yes		electronic	yes
How biosolids achieve Class A or Class B	yes	yes		electronic	yes
How biosolids achieve vector attraction reduction (VAR)	yes	yes		electronic	yes
Solids stabilization process(es) used	yes	yes		electronic	yes
Other biosolids treatments	no	not applicable (N/A)		not applicable (N/A)	no
End use or disposal practice	yes	yes		paper	yes
PFAS (as of 2018)	no	not applicable (N/A)		not applicable (N/A)	no
Microplastics (as of 2018)	no	not applicable (N/A)		not applicable (N/A)	no
TCLP (toxicity characteristic leaching procedure)	yes	no		electronic	no
Paint Filter Liquids Test	no	no		electronic	no

End use of land applied products is tracked in Delaware. We do not have records at DNREC detailing how much biosolids go to landfills. • TCLP - only required for new sites before permit issuance. TCLP and paint filter are required for sludge going to a landfill.