NATIONAL BIOSOLIDS DATA PROJECT

STATE BIOSOLIDS SURVEY

2018 data
conducted 2020-2021
biosolidsdata.org

Maine

Infrastructure & Wastewater

	2004 Data	2018 Data	
Total Number of WWTPs:	**103 (survey), 148 CWNS**	**115**	
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	4	1	----------
Total number of your state's WWTPs sending to those Separate Preparers:	0	45	----------
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	2	----------
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	10+	----------
Number of WWTPs in your state with *sludge* lagoons:	data not requested for 2004	~38	----------
Wastewater Flow Totals			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	110	----------
Total statewide WWTP *design* capacity for wastewater flow (MGD):	data not requested for 2004	no data	----------
Total statewide average daily *dry weather* 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	no data	----------
Number of WWTPs involved in those complaints:	data not requested for 2004	no data	----------
Percent of population served by on-site systems (e.g. septic systems):	no data	40%	----------

As recently as 2014, Maine DEP's sludge tracking spreadsheet included 115 municipal WRRFs, but the 2018 data used here include only the larger facilities – 45 of them, including only a few lagoon systems. U.S. EPA's 2011 listing shows 128 WRRFs in Maine; Seiple et al., 2020 count 135, based mostly on EPA Clean Watershed Needs data from 2012. • The one separate preparer noted here is the Hawk Ridge Compost Facility in Unity, operated by Casella Organics. There was another large sepatate preparer – an alkaline-stabilization facility – in Plymouth, ME that closed in the early 2010s. There was a long-term *septage* composting operation in central Maine that closed in or around 2018. • Landfills are Juniper Ridge (Old Town, owned by the State, operated by Casella) and Crossroads (Norridgewock, owned & operated by Waste Management). • Industrial pretreatment programs are at all the larger WRRFs, including Portland, So. Portland, Bangor, Augusta, Lewiston-Auburn, Sanford, Biddeford, Hampden, Saco, Pittsfield, & more. • The number of WRRFs that put their solids into lagoons for long-term storage is from Maine DEP 2011 data; all these WRRFs are small, less than1 MGD. Two of the long-term storage systems are reed beds. Lagoon facilities include Ashland, Eagle Lake, Frenchville, Mars Hill, Patten, Sinclair, Washburn, & other small towns, all of which only are cleaned out, producing solids, every 10 - 30 years. • Estimated total state average wastewater flow is the sum of data reported by WRRFs to the NBDP/NEIWPCC online survey for 2018, with gaps filled with data from Seiple et al., 2020. • Percent of population relying on septic systems is an estimate based on 1990 state-by-state data.

Biosolids Use and Disposal

UNITS:	**Dry U.S. tons**	**Dry U.S. tons**	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total):		**24,300**	

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)	86	25,549	66	9,367
Disposal & Alternative Dispositions	10	6,169	21	14,602
Other	7	490		316
TOTAL	**103**	**32,208**	**87**	**24,285**

NOTE: Quantity of sewage sludge or biosolids used or disposed means the quantity that goes out the gate of the WWTPs. Quantities are in the units (the form of measurement) indicated above.

Data on tonnages used & disposed are from 28 responses to the NEIWPCC & NBDP online survey, with additional data from the Maine Department of Environmental Protection (ME DEP) spreadsheet of sewage sludge use & disposal annually since 2011 (data for individual WRRFs are 2018 when available, or as far back as 2011). Several WRRFs' data are from 2018 U.S. EPA ECHO. Maine DEP tracks biosolids use in cubic yards; when those data were being used, NBDP converted cubic yards to dry U.S. tons assuming density of 1700 lbs./cu. yard (consistent with ME DEP practice) & 22% solids (5% for liquid; these are NBDP default factors).

Beneficial Use

	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids
Agricultural (EQ, Class A, & Class B)	31	10,549	15	2,140
Forestland (EQ, Class A, & Class B)	0	0	0	0
Reclamation (EQ, Class A, & Class B)	0	0	1	115
Class A EQ Distribution (bagged or bulk, public distribution, or unsure where it went)	55	15,000	50	7,112
Beneficial Use Subtotal	**86**	**25,549**	**66**	**9,367**
Long-term storage	7	490	many small lagoon facilities	not used or disposed in 2018
Number of *acres* to which biosolids were applied:		no data		no data

Maine DEP and NBDP estimated the number of WRRFs going to the various uses in 2018. WRRFs sending solids to agricultural land in 2018 include Lewiston-Auburn, Presque Isle, Mechanic Falls, Blue Hill, Grand Isle, Norridgewock, & Richmond. • The one reclamation program was reported by Bethel. • NBDP includes here in "Class A EQ Distribution" the ~40 WRRFs whose solids went to Hawk Ridge Compost Facility in Unity and a few others that sent solids to the Lewiston-Auburn compost facility. In addition, several WRRFs have their own composting operations, including Sanford, Scarborough, Lincoln, & Yarmouth. This led to the estimated 50 WRRFs shown here with solids going to Class A EQ general distribution. Some of the Class A EQ products may have gone to agricultural sites, but such end-use detail is not avaialble, so all the Class A EQ tonnages are included in Class A EQ Distribution unless otherwise reported. • Acreage to which Class B biosolids was land applied is reported to Maine DEP but not compiled and is not included here. • Total beneficial use tonnage is lower than in 2004 in part because the relatively large Lewiston-Auburn WPCA facility adopted anaerobic digestion in the mid-2010s and the Village Green digester started operations and taking wastewater solids; these actions reduced those facilities' solids production by more than 50%. In addition, the use of alkaline stabilization at a now-closed facility in Plymouth, ME produced more tons of biosoilds in 2004 because of the added alkaline amendments. • ME DEP received reports of 1,660 dry U.S. tons of Class A EQ biosolids coming into Maine and being land applied in 2018. All was bulk heat-dried fertilizer: most was from NEFCO's facility that treats solids from Boston's Deer Island Treatment Plant; some was from the Greater Lawrence Sanitary District and Milorganite (the latter is sold in bags). The tonnages of these out-of-state products are not included here.

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)	10	6,169	20	14,591
Burial	data not requested for 2004	data not requested for 2004	20	14,591
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004	0	0
Surface Disposal (i.e., beneficial reuse)	0	0	1	12
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	**10**	**6,169**	**21**	**14,602**
TOTAL	**103**	**32,208**	**87**	**23,969**

The estimate of ~20 WRRFs sending solids to landfills is based on ME DEP and NBDP data. There were likely more smaller facilities that did so as well. • The two large landfills, at Norridgewock and Old Town, received most of these landfilled solids, much of the total tonnage being from Portland & South Portland, whose treated solids went to landfill when beneficial use options were not available at the time. • Some WRRF solids went to *local* landfills; for example, Brewer's solids went to the Hartland municipal landfill. Some WRRFs, such as Portland and the Kennebec Sanitary Treatment District (Waterville), sent some solids to a separate preparer (compost facility) and some to landfill.

Biosolids Quality Summary

	Number of Entities (WWTPs & Sep. Preparers) Producing…	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Producing…	Quantity of Biosolids
Class A EQ	55	21,404	50	7,112
Other Class A	0	0	0	0
Class B	31	4,145	15	2,255
Other (no data, etc.)	20	6,659	20	14,591
TOTAL	**106**	**32,208**	**85**	**23,957**

NOTE: For "number of entities," the total may not match because some entities go to more than one use or disposal.

The number of WRRFs producing Class A EQ refers to all those whose solids go into producing Class A EQ product. Most of those 50 send solids to the Hawk Ridge Compost Facility, but there are also several other composting operations, as noted above. • Some of the landfilled biosolids were likely treated to Class A or Class B standards, but this was not clear, so those solids are included in the "other" category, which also includes solids that are not treated to Class A or B standards and are just sent to landfill.

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…
Stabilization				
Aerobic Digestion (total)	no data	no data	0	0
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		
Anaerobic digestion (AD) (total)	one or two	no data	2	1,920
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	2	1,920
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004	2	N/A
Biogas used (heating, electicity, fuel, etc.;scf/year)	data not requested for 2004	data not requested for 2004	2	N/A
Lime/Alkaline (total)	many	no data	few, if any	no data
Class A lime/alkaline	data not requested for 2004	data not requested for 2004		
Class B lime/alkaline	data not requested for 2004	data not requested for 2004		
Composting	many	no data	8	7,112
Thermal (e.g. heat drying, not incineration/gasificatn/pyrol)	0	no data	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
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004	0	N/A
Long-term (lagoons, reed beds, etc.)	several		~38	N/A
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004	several	N/A
Other stabilization technology	no data	no data	0	0
Dewatering				
Belt Filter Press	many	no data	fewer than in 2004	no data
Plate & Frame Press	some	no data	fewer than in 2004	no data
Screw Press	several	no data	more than in 2004	no data
Centrifuge	few to none	no data	few	no data
Vaccuum Filter	no data	no data	0	no data
Drying beds (open-air)	no data	no data	several	no data
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004	0	no data
Other dewatering technology	no data	no data	no data	no data
Thickening				
Gravity thickener	data not requested for 2004	data not requested for 2004	no data	no data
Gravity belt thickener (GBT)	data not requested for 2004	data not requested for 2004	no data	no data
Centrifuge	data not requested for 2004	data not requested for 2004	no data	no data
Dissolved air flotation (DAF)	data not requested for 2004	data not requested for 2004	no data	no data
Other thickening technology	data not requested for 2004	data not requested for 2004	no data	no data
Other				
Biosolids sold in bags (explain at right what size bags)	data not requested for 2004	data not requested for 2004	0	0

The two anaerobic digestion systems are at Lewiston-Auburn Water Pollution Control Authority (LAWPCA) and the private, independent Village Green facility in Brunswick. Both do co-digestion of wastewater soids and other wastes (e.g. food waste, fats/oils/grease) and utilize the biogas they generate for electricity and heat. • New England's largest compost facility is the Hawk Ridge Compost Facility in Unity, operated by Casella Organics. It takes in wastewater solids from ~40 WRRFs, along with other organic residuals. Other composters include Sanford, Scarborough, Lincoln, Yarmouth, and Lewiston-Auburn (the LAWPCA compost facility was taking in solids from other facilities in 2018). The quantity of compost is assumed to be 100% of the Class A EQ material reported. • The number of WRRFs that put their solids into lagoons for long-term storage is from Maine DEP 2011 data; all these WRRFs are small, less than1 MGD. Two of the long-term storage systems are reed beds.

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

	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)	41	39	3000	1500	300	10	75	420	100	2800
State high quality (lower number) limit (mg/kg)	34	10	1000	1000	300	6	75	200	100	2000
State CPLR (kg/ha)	34	39		1500	300	6		420	100	2800
State APLR (kg/ha/365days)	2	2		75	15	0		20	5	140

****Line 11 rounds up to the nearest whole number. Some of the Maine DEP limits are not whole numbers. See state regulations for details.**

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.)			not applicable (N/A)	other frequency	license-specific
Other metals (boron, silver…)			not applicable (N/A)	other frequency	license-specific
Dioxins/furans			not applicable (N/A)	other frequency	license-specific
PCBs			not applicable (N/A)	other frequency	license-specific
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf))			not applicable (N/A)	other frequency	license-specific
Other organic compounds (e.g. PDBEs, pharmaceutical)			not applicable (N/A)	other frequency	license-specific
Radioactive isotopes (alpha, beta, Ra 226, etc.)			not applicable (N/A)		
Nutrients (NPK)			not applicable (N/A)	other frequency	license-specific
Pathogen reduction (Class A or B)			not applicable (N/A)	other frequency	license-specific
Vector attraction reduction (VAR)			not applicable (N/A)	other frequency	license-specific
PFAS (as of 2018)			not applicable (N/A)	other frequency	license-specific
Microplastics (as of 2018)			not applicable (N/A)	other frequency	license-specific
TCLP (toxicity characteristic leaching procedure)			not applicable (N/A)	other frequency	license-specific
Paint Filter Liquids Test			not applicable (N/A)	other frequency	license-specific

Unknown if testing is required for "all sewage sludge or biosolids". Testing is specified per program per license.

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? If 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		program and license-specific		
Part 503 metals (As, Cu, Hg, etc.)			program and license-specific		

Other metals (boron, silver…)			program and license-specific		
Dioxins/furans			program and license-specific		
PCBs			program and license-specific		
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf)			program and license-specific		
Other organic compounds (e.g. PDBEs, pharmaceutical)			program and license-specific		
Radioactive isotopes (alpha, beta, Ra 226, etc.)			program and license-specific		
Nutrients (NPK)			program and license-specific		
Cumulative Pollutant Loading Rates (CPLR)			program and license-specific		
How biosolids achieve Class A or Class B			program and license-specific		
How biosolids achieve vector attraction reduction (VAR)			program and license-specific		
Solids stabilization process(es) used			program and license-specific		
Other biosolids treatments			program and license-specific		
End use or disposal practice			program and license-specific		
PFAS (as of 2018)			program and license-specific		
Microplastics (as of 2018)			program and license-specific		
TCLP (toxicity characteristic leaching procedure)			program and license-specific		
Paint Filter Liquids Test			program and license-specific		

Data compiled differently per program. Some paper-only, some electronic, some both paper and electronic. Some data not compiled.