

## Missouri

### Infrastructure & Wastewater

	2004 Data	2018 Data	
<b>Total Number of WWTPs:</b>	no data (survey), 732 CWNS	745 (CWNS), 97 (NBDP)	NOTE: 2004 data at left are estimates from total wastewater flow, using USEPA "Biosolids Generation Factor."
<b>WWTP &amp; Biosolids Infrastructure Totals</b>			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	no data	>1	-----
Total number of your state's WWTPs sending to those Separate Preparers:	no data	no data	-----
Number of operating sludge incinerators in your state (total):	no data	4	-----
Fluidized bed:	no data	1	-----
Multiple hearth:	no data	3	-----
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004		-----
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	47	-----
Number of WWTPs in your state with <i>sludge lagoons</i> :	data not requested for 2004	>3	-----
<b>Wastewater Flow Totals</b>			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	no data	-----
Total statewide WWTP <i>design</i> capacity for wastewater flow (MGD):	data not requested for 2004	no data	-----
Total statewide average daily <i>dry weather</i> flow (MGD):	data not requested for 2004	no data	-----
<b>Other Totals</b>			
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	-----

The data presented here are from two main sources: a survey designed by NBDP and distributed to WRRFs in MO with the help of the Missouri Water Environment Association (MWEA) and U. S. EPA's Enforcement and Compliance History Online (ECHO) database. Additionally, individuals from the Missouri Department of Natural Resources supplied a few data points, as indicated. Data were obtained for 97 facilities that together treat ~86% of the state's average daily wastewater flow. • The one known separate preparer in MO is the Tri-Lakes Regional Biosolids Drying Facility. • In 2018, there were 4 facilities with sewage sludge incinerators (SSIs) in operation: Bissell Point & Lemay WWTPs (St. Louis), Blue River WWTP (Kansas City), and LBVSD Atherton WWTP. These are 4 of the largest WWTPs in the state. • There are at least 3 WWTPs with sludge lagoons, according to data obtained, and there are likely many more at small WWTPs. • MDNR estimated 47 pretreatment programs in MO.

### Biosolids Use and Disposal

UNITS:	Dry U.S. tons	Dry U.S. tons	
<b>BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total): 128,900</b>			
<b>Summary</b>			
	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)	no data	85,000	71 29,285
Disposal & Alternative Dispositions	no data	85,000	32 89,784
Other	0	0	no data 9,811
<b>TOTAL</b>	-	<b>170,000</b>	<b>103</b> <b>128,880</b>
<b>Beneficial Use</b>			
	Number of Entities (WWTPs & Sep. Preparers) Going To...	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To... Quantity of Biosolids
Agricultural			67 28,652
Forestland			0 0
Reclamation			0 0
Class A EQ Distribution			4 633
Beneficial Use Subtotal	-	-	71 29,285
Long-term storage			9 9,811
Number of <i>acres</i> to which biosolids were applied:		no data	~5000
<b>Disposal &amp; Alternative Dispositions</b>			
	Number of Entities (WWTPs & Sep. Preparers) Going To...	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To... Quantity of Biosolids
MSW landfill (total)			21 10,061
Burial	data not requested for 2004	data not requested for 2004	no data no data
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004	no data no data
Surface Disposal			see note at right see note at right
Incineration			11 79,723

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.

This information is not tracked by MDNR. NBDP compiled these data from the sources mentioned above.

NOTE: 2004 data were incomplete. See 2007 report, Appendix D, for more info.

Long-term storage may be high for 2018 due to significant flooding of land application sites. Survey respondents were instructed to substitute 2017 data if their biosolids management was significantly affected. Some of the solids stored may have been on-site. • Acres applied to is based on NBDP survey responses and may have been lower than normal in 2018 because of flooding (survey respondents reported ~11,000 permitted acres for land application).

Besides the 4 WRRFs with incinerators, 7 other facilities send solids for incineration (and other management) to those facilities for a total of 11 entities utilizing incineration for at least some of their solids. • Data compiled indicated 9 facilities and 954 dry tons of

Cement kiln or industrial furnace	data not requested for 2004	data not requested for 2004	0	0	total of 11 entities utilizing incineration for at least some of their solids. • Data compiled indicated 3 facilities and 394 dry tons of biosolids went to surface disposal. This is assumed to be landfilled, since MDNR indicated there are no biosolids surface disposal sites in MO (monofills, etc.). There are at least two SSI ash-only landfills.
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	-	-	32	89,784	
<b>TOTAL</b>	-	-	<b>112</b>	<b>128,880</b>	

### 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			8	2,508	Most MO biosolids go to incineration; their quality is not tracked.
Other Class A			4	64	
Class B			68	52,433	
Other (no data, etc.)			10	73,875	
<b>TOTAL</b>	-	-	<b>90</b>	<b>128,880</b>	

### 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...		
<b>Stabilization</b>						
<b>Aerobic Digestion (total)</b>			186	no data	This information is not tracked. • The two identified biosolids composting operations are Sedalia (3 WWTPs) and Belton (1 WWTP). • The one biosolids drying facility is Tri Lakes Regional. • All other numbers here were supplied by MDNR.	
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004	no data	no data		
Class B	data not requested for 2004	data not requested for 2004	no data	no data		
<b>Anaerobic digestion (AD) (total)</b>			17	no data		
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004	no data	no data		
Class B (mesophilic)	data not requested for 2004	data not requested for 2004	no data	no data		
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004	no data	N/A		
Biogas used (heating, electricity, fuel, etc./scf/year)	data not requested for 2004	data not requested for 2004	no data	N/A		
<b>Lime/Alkaline (total)</b>			no data	no data		
Class A lime/alkaline	data not requested for 2004	data not requested for 2004	no data	no data		
Class B lime/alkaline	data not requested for 2004	data not requested for 2004	no data	no data		
<b>Composting</b>			2	637		
Thermal (e.g. heat drying, not incineration/gasification/pyrolysis)			1	-1,100		
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.)			1	N/A		
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004	112	N/A		
Other stabilization technology			0	0		
<b>Dewatering</b>						
Belt Filter Press			no data	no data		
Plate & Frame Press			no data	no data		
Screw Press			no data	no data		
Centrifuge			no data	no data		
Vacuum Filter			no data	no data		
Drying beds (open-air)			no data	no data		
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004	no data	no data		
Other dewatering technology			no data	no data		
<b>Thickening</b>						
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		
<b>Other</b>						
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

	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)										
State high quality (lower number) limit (mg/kg)										
State CPLR (kg/ha)										
State APLR (kg/ha/365days)										

### 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	no	(please select)		
Dioxins/furans	no	yes	(please select)		
PCBs	no	no	(please select)		
Priority pollutants ( <a href="https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf">https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf</a> )	no	yes	(please select)	1/year or otherwise required by permit	Required if pretreatment is required.
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	no	(please select)		
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	no	(please select)		
Nutrients (NPK)	no	yes	yes		
Pathogen reduction (Class A or B)	no	no	Yes		
Vector attraction reduction (VAR)	no	no	Yes		
PFAS (as of 2018)	no	no	(please select)		
Microplastics (as of 2018)	no	no	(please select)		
TCLP (toxicity characteristic leaching procedure)	no	no	(please select)		
Paint Filter Liquids Test	no	no	(please select)		

### 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	no
Part 503 metals (As, Cu, Hg, etc.)	yes	yes		paper	no
Other metals (boron, silver...)	no	(please select)		(please select)	(please select)
Dioxins/furans	no	(please select)		(please select)	(please select)
PCBs	no	(please select)		(please select)	(please select)
Priority pollutants	yes	yes		paper	no
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	(please select)		(please select)	(please select)
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	(please select)		(please select)	(please select)
Nutrients (NPK)	yes	yes		(please select)	(please select)
Cumulative Pollutant Loading Rates (CPLR)	no	(please select)		(please select)	(please select)
How biosolids achieve Class A or Class B	Yes	Yes		(please select)	(please select)
How biosolids achieve vector attraction reduction (VAR)	Yes	Yes		(please select)	(please select)
Solids stabilization process(es) used	no	yes		(please select)	(please select)
Other biosolids treatments	yes	yes		paper	no
End use or disposal practice	yes	yes		paper	no
PFAS (as of 2018)	no	(please select)		(please select)	(please select)
Microplastics (as of 2018)	no	(please select)		(please select)	(please select)
TCLP (toxicity characteristic leaching procedure)	no	(please select)		(please select)	(please select)
Paint Filter Liquids Test	no	(please select)		(please select)	(please select)