



STATE BIOSOLIDS SURVEY

2018 data
conducted 2020-2021
biosolidsdata.org

Indiana

Infrastructure & Wastewater

	2004 Data	2018 Data	
Total Number of WWTPs:	193 (survey), 411 CWNS	769	
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	7	7	*****
Total number of your state's WWTPs sending to those Separate Preparers:	36	96	*****
Number of operating sludge incinerators in your state (total):	1	4	*****
Fluidized bed:	0	0	*****
Multiple hearth:	1	4	*****
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004	34	*****
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</i> lagoons:	data not requested for 2004	no data	*****
Wastewater Flow Totals			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	~1050	*****
Total statewide WWTP <i>design</i> capacity for wastewater flow (MGD):	data not requested for 2004	1,200	*****
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	0	*****
Number of WWTPs involved in those complaints:	data not requested for 2004	0	*****
Percent of population served by on-site systems (e.g. septic systems):	no data	no data	*****

* NPDES Program at IDEM (in the water division) does not track some of this information. • Biosolids are overseen by the IDEM solid waste program. • Actual and design flow estimates are from IDEM list of active NPDES "sewerage systems." • Separate preparers: There are 7 regional biosolids centers (RBCs) in the state, and these take in biosolids from 2 or more WWTPs, blend, and land apply them. The state then considers them generators. 96 WWTPs sent solids to the 7 separate preparers in 2018, as counted by the IDEM expert who counted only domestic wastewater sludge generators and not the many industrial sludge generators that also send solids to some of the RBCs. • Indianapolis is the one system that operates incineration; they have 4 sewage sludge incinerators at the Belmont treatment facility, where solids from that facility and the Southport facility are burned.

Biosolids Use and Disposal

UNITS:	Dry U.S. tons	Dry U.S. tons	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total): 200,000			
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)	145	106,099	96 72,739
Disposal & Alternative Dispositions	48	90,864	38 94,036
Other*, likely landfilled (see Add'l Total Estimate Calculations, below)	0	0	no data 34,000
TOTAL	193	196,963	134 200,775
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)	133	43,977	84 42,826
Forestland (EQ, Class A, & Class B)	0	0	0 0
Reclamation (EQ, Class A, & Class B)	0	0	0 0
Class A EQ Distribution (bagged or bulk, public distribution, or unsure where it went)	12	62,122	12 29,913
Beneficial Use Subtotal	145	106,099	96 72,739
Long-term storage	0	0	no data
Number of acres to which biosolids were applied: 14,976 18,178			
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
MSW landfill (total), including landfilled solids not reported to IDEM*	48	39,041	36 67,289
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	0	0	- -
Incineration	2	51,823	2 60,747
Cement kiln or industrial furnace	data not requested for 2004	data not requested for 2004	- -
Deep well injection	data not requested for 2004	data not requested for 2004	- -
Gasification	data not requested for 2004	data not requested for 2004	- -
Pyrolysis	data not requested for 2004	data not requested for 2004	- -
Disposal & Alternative Dispositions Subtotal	48	90,864	38 128,036

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.

The total number of entities overlap, as some who land apply may also dispose of some biosolids by landfill or alternate means when ground conditions are not suitable for land application.

EPA ECHO biosolids data show 49,900 dry U. S. tons "land applied" (meaning put on soil, either Class A or B) in 2018, of which 28,140 dry U. S. tons was Class A, including, for example, Fort Wayne's compost-like product. The IDEM data are more complete and of higher quality than the ECHO data. For example, ECHO data for Brownsburg indicates 474 dry U. S. tons land applied, but Merrell Bros. reports that it may have gone to a nearby, low-cost landfill. • IDEM does not track long term storage. • For Class A EQ Distribution, there were also 3 out-of-state facilities (Milorganite/Milwaukee, Louisville KY, and Chicago) that distributed 22,609 dry tons in Indiana in 2018, but these are not included in the data at left. • Acres applied to are only tracked for Class B land application.

The number of facilities (36) that dispose by landfilling that are included here are only those facilities that hold a land application permit or have in the past and voluntarily continue to submit reports to the land application program. This number (36 facilities) does not represent all facilities in the State of Indiana that dispose of their biosolids by methods other than land application or incineration. The quantity of biosolids disposed includes 33,289 dry U. S. tons reported to the IDEM solid waste division by WWTPs that have land application permits but landfilled some or all their solids in 2018. For example, as reported by Merrell Bros. regarding Richmond Class B biosolids: "the wet spring (and their capacity being affected due to construction) caused us to dewater for them using a belt-press. The City owns the landfill, so we hauled it there for them due to the fields being too wet. The only reason IDEM knows of this tonnage is because Richmond has a land app permit; otherwise, there is no requirement to report landfill disposal through IDEM." • Additional solids - 34,000 dry U. S. tons assumed to be landfilled - were estimated by the NBDP team; see "Additional Total Estimate Calculations," below. • Final cover is land application and would be tracked as land applied; not aware of any biosolids used for final cover. • *Not aware of any IN facilities disposing of biosolids using any of these alternative methods. • Indianapolis reported to this survey 55,124 drv metric tons (= 60,747 dry U. S. tons) onertaed & incinerated, which matches its report to EPA's ECHO

TOTAL	193	196,963	134	200,775	database. However, some small IN WWTP may send their solids to the Indianapolis incinerators
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Biosolids Quality Summary

	Number of Entries (WWTPs & Sep. Preparers) Producing...	Quantity of Biosolids	Number of Entries (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	11	61,197	15	52,522	IDEM does not track all facilities or amount produced. They only track those with land application or marketing and distribution permits and the volume out the gate (land applied, marketed/distributed, landfilled, hauled to other treatment works, etc.). - The "Other (no data, etc.)" is the 2 incineration facilities at Indianapolis, plus an estimate likely dozens of WWTPs (not included at left) that send an estimated 34,000 dry U. S. tons solids (included in the 72,139 tons shown at left) only to landfill and have no land application permit.
Other Class A	1	924	0	0	
Class B	135	45,753	129	76,114	
Other (no data, etc.)	no data	no data	2	72,139	
TOTAL	147	198,738	146	200,775	

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)	662	no data	91	no data
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004	3	no data
Class B	data not requested for 2004	data not requested for 2004	88	no data
Anaerobic digestion (AD) (total)	94	no data	37	no data
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004	2	no data
Class B (mesophilic)	data not requested for 2004	data not requested for 2004	35	no data
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004	3	N/A
Biogas used (heating, electricity, fuel, etc./year)	data not requested for 2004	data not requested for 2004	no data	N/A
Lime/Alkaline (total)	19	no data	10	no data
Class A lime/alkaline	data not requested for 2004	data not requested for 2004	6	no data
Class B lime/alkaline	data not requested for 2004	data not requested for 2004	4	no data
Composting	3	no data	3	no data
Thermal (e.g. heat drying, not incineration/gasifcatn/pyrol)	17	no data	3	no data
Gasification	data not requested for 2004	data not requested for 2004	no data	no data
Pyrolysis	data not requested for 2004	data not requested for 2004	no data	no data
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004	no data	N/A
Long-term (lagoons, reed beds, etc.)	4	no data	26	N/A
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004	no data	N/A
Other stabilization technology	0	0	no data	no data
Dewatering				
Belt Filter Press	no data	no data	no data	no data
Plate & Frame Press	no data	no data	no data	no data
Screw Press	no data	no data	no data	no data
Centrifuge	no data	no data	no data	no data
Vacuum Filter	no data	no data	no data	no data
Drying beds (open-air)	no data	no data	45	no data
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004	1	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	no data	no data

*Additional Total Estimate Calculations

IDEM data provided are based on reports on all land application and some landfilling (when a facility has or had a land application permit and reports landfilling). However, IDEM knows it does not have data on additional solids landfilled when the WWTP does not have a land application permit. The following calculations were used by the NBDP to independently estimate the additional mass of solids landfilled in 2018, using other data sources.

2018 U. S. EPA electronic reporting data (ECHO), solids generated		160,303	U. S. dry tons
incinerated (Indianapolis, 2 WWTPs)	60,746		U. S. dry tons
other disposition	99,557		U. S. dry tons
3 additional WWTP's data from NBDP WWTP survey		348	U. S. dry tons
12 additional larger WWTPs that are ~19% of state avg. flow, 149.71 MGD		26,199	U.S. dt, assuming 175 U.S.dt solids/MGD (IN mean), 0% to other WWTPs
Total U. S. dry tons solids estimate for ~76% of flow (down to 4 MGD)		186,850	U. S. dry tons
Other major (1 - 4 MGD) WWTPs, per Seiple et al 2020, 157.69 MGD		13,798	U.S. dt, assuming 175 U.S.dt solids/MGD (IN mean), 50% to other WWTPs
Adjusted estimate of total solids used & disposed in IN	200,648	200,648	U. S. dry tons
beneficial use: IDEM number of tons beneficially used is accurate	72,739		U. S. dry tons
incineration data are accurate, from ECHO report by Indianapolis	60,746		U. S. dry tons
IDEM data on landfill disposal, accurate based on reports	33,289		U. S. dry tons
other - likely additional landfill disposal - NBDP estimate	33,874		U. S. dry tons

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	40 mg/kg limit for Mo on pass	420	36 (CPLR = 100)	2800
State ceiling limit (higher limit) (mg/kg)										
State high quality (lower number) limit (mg/kg)							75			
State CPLR (kg/ha)										
State APLR (kg/ha/365days)		0.504								Industrial waste has a lower Cd APLR than for biosolids; generally not a problem; most industrial material is food waste

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	no	amount generated
Other metals (boron, silver...)	no	no	not applicable (N/A)	no	
Dioxins/furans	no	no	not applicable (N/A)	no	
PCBs	no	yes	yes	no	amount generated
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf)	(please select)	(please select)	(please select)		
Other organic compounds (e.g. PDBEs, pharmaceutical)	(please select)	(please select)	(please select)		
Radioactive isotopes (alpha, beta, Ra 226, etc.)	(please select)	(please select)	(please select)		
Nutrients (NPK)	no	yes	(please select)		application occurs
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)	(please select)	no	not applicable (N/A)		
Paint Filter Liquids Test	(please select)	no	no		

NPDES program requires testing for priority pollutants.

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	no	monthly	electronic	no
Part 503 metals (As, Cu, Hg, etc.)	yes	no	monthly when land apply	electronic	no
Other metals (boron, silver...)	no	not applicable (N/A)	n/a	not applicable (N/A)	no
Dioxins/furans	no	not applicable (N/A)	n/a	not applicable (N/A)	no
PCBs	yes	no	with permit renewal	not applicable (N/A)	no
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf)	(please select)	(please select)		(please select)	(please select)
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	not applicable (N/A)		(please select)	(please select)
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	not applicable (N/A)		(please select)	(please select)
Nutrients (NPK)	yes	(please select)		electronic	no
Cumulative Pollutant Loading Rates (CPLR)	no	not applicable (N/A)		(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	yes	yes		(please select)	(please select)
Other biosolids treatments	yes	yes		(please select)	(please select)
End use or disposal practice	yes	yes		(please select)	(please select)
PFAS (as of 2018)	no	not applicable (N/A)		(please select)	(please select)
Microplastics (as of 2018)	no	not applicable (N/A)		(please select)	(please select)
TCLP (toxicity characteristic leaching procedure)	no	not applicable (N/A)		(please select)	(please select)
Paint Filter Liquids Test	yes	not applicable (N/A)		(please select)	(please select)

State rules require monthly reporting even when no disposal is reported. • Priority pollutants are covered under the NPDES program. • Only facilities holding a land application permit are required to report disposal method and volume. • Data are entered into access database and can be queried for various uses and reports (metals, nutrients, volume land applied, landfilled, or taken to another treatment facility or regional center).