NATIONAL BIOSOLIDS DATA PROJECT

STATE BIOSOLIDS SURVEY

2018 data
conducted 2020-2021
biosolidsdata.org

Texas

Infrastructure & Wastewater

	2004 Data	2018 Data	
Total Number of WWTPs:	**1067 (survey), 1380 CWNS**	**2800**	
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	4	no data	----------
Total number of your state's WWTPs sending to those Separate Preparers:	0	no data	----------
Number of operating sludge incinerators in your state (total):	no data	0	----------
Fluidized bed:	no data	0	----------
Multiple hearth:	no data	0	----------
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004	86	----------
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	73	----------
Number of WWTPs in your state with *sludge* lagoons:	data not requested for 2004	200	----------
Wastewater Flow Totals			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	2,525	Seiple et al., 2020
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	~20	----------
Number of WWTPs involved in those complaints:	data not requested for 2004	hard to say	----------
Percent of population served by on-site systems (e.g. septic systems):	no data	~20%	----------

Of the 2800 WRRFs in Texas (an estimate), there are many small package plants – for example, over 750 in the Houston metro area alone. • There are about 200 pond systems and 10 sludge lagoons used for storage and disposal. The solids from these are cleaned out every 10 - 20 years. Any cleaned out and used or disposed in 2018 are included in the data here. • TCEQ does not receive many odor complaints, considering the large amount of land application, probably because most land application sites are isolated in rural areas. The regional TCEQ offices manage complaints. TCEQ estimates there are 10 - 15 significant complaints each year, most notably in recent years in north TX in the Dallas/Ft. Worth region. • The estimate that 20% of Texans are served by on-site systems is based on the fact that 85% of the population is in urban areas served by sewer systems and WWTPs (https://demographics.texas.gov/Resources/publications/2017/2017_08_21_UrbanTexas.pdf)

Biosolids Use and Disposal

UNITS:	Dry metric tons	Dry metric tons	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total):		**474,000**	

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)	132	158,861	435	209,813
Disposal & Alternative Dispositions	424	329,149	no data	263,980
Other	511	154,568	511	
TOTAL	**1,067**	**642,578**	**946**	**473,793**

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 tonnage of biosolids used or disposed in 2004 should have been reported as 571,411 dry metric tons. • For 2018, there are no data available for the number of WWTPs going to landfill.

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)	98	24,304	400	157,281
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)	34	134,557	35	52,532
Beneficial Use Subtotal	**132**	**158,861**	**435**	**209,813**
Long-term storage	511	154,568	511	154,568
Number of *acres* to which biosolids were applied:		23,112		18,257

In TX, Class B land application sites are permitted, with more thorough record-keeping than for Class A biosolids use sites. Class B sites can have biosolids from multiple WWTPs, and these sources change year by year, as documented in site permit applications or as additional sources are added to an already-issued permit. All of TX Class B biosolids, 34,706 dry metric tons, were used on agricultural lands. • TX also regulates "Class AB" biosolids, which meet EPA Class A EQ biosolids standards, but are applied in bulk in accordance with Class B management practices, to reduce risks of malodors and other nuisances. Of the total EQ, Class A, and Class AB biosolids produced, 175,107 dmt, the project team assumed 70% were applied in bulk on agricultural land (122,575 dmt), mostly as Class AB, or mixed into fertilizers for bulk application. For example, Houston WWTPs produced 29,107 dry metric tons of "Houactinite" biosolids that were transported in bulk to agricultural land application or fertilizer blending operations, with most of the fertilizer being applied to agricultural lands. However, some EQ product is compost from the 28 composters, including Austin and San Antonio; such compost is used in landscaping, horticulture, etc., as well as in agriculture. The project team assumed that 30% of total EQ biosolids was distributed to the general public, 52,532 dmt. • For 2018, in this spreadsheet, there is a significant increase in the total biosolids reported as compared to 2004. Population growth is likely the major reason for this increase. But, in addition, there is one land applier that had only a few land application sites in the state in 2004, but has now taken over numerous sites and biosolids sources, including numerous small WWTPs (e.g. package plants in the Houston metro area), which means these biosolids were counted for 2018 but not for 2004. • Although there are about 35 Class A marketing and distribution facilities in Texas, some may have EQ biosolids only occasionally - when they clean out drying beds every ten years or so. • Data on long-term storage of biosolids were not available for 2018, but it is expected that the numbers would remain about the same as the data gathered in 2004 - a guesstimate. Tons put into long-term storage are not included in the total biosolids used or disposed in 2018. • The number of acres to which biosolids were applied in 2018 is the total for permitted Class B sites only. Thousands of additional acres received Class AB and EQ biosolids, but exact data are not available because reporting for Class AB use is less than for Class B use.

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)	406	288,244	no data	218,776
Burial	data not requested for 2004	data not requested for 2004		
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004		
Surface Disposal	14	40,311	12	45,204
Incineration	4	594	0	0
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	**424**	**329,149**	**12**	**263,980**
TOTAL	**1,067**	**642,578**	**958**	**473,793**

The quantity of biosolids going to landfill is calculated based on the quantity of sludge received at landfills in 2018, as reported to the TCEQ: 1,340,044 wet U.S. tons. Using a default average of 18% solids for sewage sludge (knowing that landfills require dewatered sludge that passes a paint filter test), and converting to metric, the dry metric tonnage landfilled is calculated to be 218,776. • WWTPs are authorized to send their biosolids to a landfill, to another facility for further processing, or to a beneficial land use site. A facility could use any one of these disposal options at any time. Therefore, data are not kept on the number of WWTPs going to landfills.

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	34	134,557	34	175,107
Other Class A	0	0	0	0
Class B	98	24,304	400	34,706
Other (no data, etc.)	935	483,717	12	263,980
TOTAL	**1,067**	**642,578**	**446**	**473,793**

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

Biosolids disposed in landfills or surface disposal sites may or may not be treated to Class A or Class B quality.

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		
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004		
Class B	data not requested for 2004	data not requested for 2004		
Anaerobic digestion (AD) (total)	no data	no data		
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004		
Class B (mesophilic)	data not requested for 2004	data not requested for 2004		
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004		N/A
Biogas used (heating, electicity, fuel, etc.;scf/year)	data not requested for 2004	data not requested for 2004		N/A
Lime/Alkaline (total)	no data	no data	no data	N/A
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	no data	no data	28	no data
Thermal (e.g. heat drying, not incineration/gasificatn/pyrol)	no data	no data	no data	N/A
Gasification	data not requested for 2004	data not requested for 2004		
Pyrolysis	data not requested for 2004	data not requested for 2004		
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004		N/A
Long-term (lagoons, reed beds, etc.)	no data	no data	no data	N/A
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004		N/A
Other stabilization technology	no data	no data	no data	N/A
Dewatering				
Belt Filter Press	no data	no data	no data	
Plate & Frame Press	no data	no data	no data	
Screw Press	no data	no data	no data	
Centrifuge	no data	no data	no data	
Vaccuum Filter	no data	no data	no data	
Drying beds (open-air)	no data	no data	no data	
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004		
Other dewatering technology	no data	no data	no data	
Thickening				
Gravity thickener	data not requested for 2004	data not requested for 2004		
Gravity belt thickener (GBT)	data not requested for 2004	data not requested for 2004		
Centrifuge	data not requested for 2004	data not requested for 2004		
Dissolved air flotation (DAF)	data not requested for 2004	data not requested for 2004		
Other thickening technology	data not requested for 2004	data not requested for 2004		
Other				
Biosolids sold in bags (explain at right what size bags)	data not requested for 2004	data not requested for 2004		

Data on biosolids treatment practices and equipment are collected: any time a municipal permit is drafted by TCEQ, treatmeant and disposal options involved in that particular permit are selected from a list provided of all possible options within the permitting database. TCEQ ran a report on these treatment data, and shared that report with the National Biosoilds Data Project (NBDP, but all treatment practices for each WRRF (2500 in total) are listed in one cell, making the data less sortable by treatment, so data presented here are limited.

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)			3000						100	
State high quality (lower number) limit (mg/kg)			1200						36	
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.)	yes	no	yes	quarterly reporting for land appliers	
Other metals (boron, silver…)	no	no	not applicable (N/A)		
Dioxins/furans	no	no	not applicable (N/A)		
PCBs	yes	no	yes		
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf))	no	no	not applicable (N/A)		
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	no	not applicable (N/A)		
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	no	not applicable (N/A)		
Nutrients (NPK)	yes	no	yes		
Pathogen reduction (Class A or B)	yes	no	yes	quarterly reporting for land appliers	
Vector attraction reduction (VAR)	yes	no	yes	quarterly reporting for land appliers	
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)	yes	no	yes		
Paint Filter Liquids Test	no	no	not applicable (N/A)		

Under state regulations, quarterly reporting is required for Class B land application for amounts land applied, cumulative metals, and verification that the biosolids met pathogen reduction and VAR.

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	not applicable (N/A)		not applicable (N/A)	no
Dioxins/furans	no	not applicable (N/A)		not applicable (N/A)	no
PCBs	yes	yes		paper	no
Priority pollutants	no	not applicable (N/A)		not applicable (N/A)	no
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	yes		paper	no
Cumulative Pollutant Loading Rates (CPLR)	yes	yes		paper	no
How biosolids achieve Class A or Class B	yes	yes		paper	no
How biosolids achieve vector attraction reduction (VAR)	yes	yes		paper	no
Solids stabilization process(es) used	yes	yes		paper	no
Other biosolids treatments	yes	yes		paper	no
End use or disposal practice	yes	yes		paper	no
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	yes		paper	no
Paint Filter Liquids Test	no	not applicable (N/A)		not applicable (N/A)	no