

1. Welcome

Are you in New York or New England (CT, MA, ME, NH, RI, VT)?

If you are with a WWTP in one of these states, please **do not fill in this survey**. (You will be asked to do so later.)

Has anyone else at your WWTP filled in this survey? Or might they? Please check, to avoid duplicates. Click the green button here: <https://www.nebiosolids.org/nbii2definitions>

Welcome to The National Biosolids Survey - 2018 Data.

This is the second time this major national U.S. survey has been done; the initial survey was published in 2007, reporting 2004 data (download that report here, at the bottom of the page: <https://www.nebiosolids.org/national-biosolids-survey-2018-data>.) The results of this current survey will be published in spring 2021 and will benefit all stakeholders in the management of wastewater and biosolids in the U.S.

Thank you for your time and help! We know your time is limited. Your input is vital to advancing nationwide understanding for the whole profession. Everyone is pitching in, for the benefit of all.

You will need: Your 2018 EPA Part 503 Sludge Report (filed in February 2019) and/or your 2018 report to your state.

Want a preview? [Download the PDF version of this survey](#) and keep it open for reference. But fill it out here online.

You might need information from colleagues. We suggest you copy the applicable questions from the PDF into an email for them, and then you enter the data they provide.

The data requested are about: *sewage sludge and biosolids from public and private wastewater treatment plants (WWTPs) treating domestic sewage, who used or disposed of sewage sludge/biosolids in 2018*. If your facility fits this description, please proceed with the survey below.

The Core Survey has about 25 questions; many are quick to answer. It should take about 30 minutes to complete (if you have your 2018 data all set to go). Please respond to each question to the best of your ability. If firm data are not available, estimates are fine. Add explanations and comments in the spaces provided. Leave blank any questions that don't apply to your WWTP.

At the end, we'll ask you to complete additional questions about operations, economics, and energy.

Please do that today or as soon as you can.

1. Instructions

Survey support page: <https://www.nebiosolids.org/nbii2definitions> Open this page in a separate browser window and refer to it as needed.

If you have more than one WWTP / WRRF and the solids/biosolids are managed separately and differently, please use a different computer to enter the data for each WWTP / WRRF. **But, if the solids from different facilities are managed together or in essentially the same way**, just fill in one survey for all the facilities, adding their data together. Add explanations in the comment boxes.

- All data and information should be for **calendar year 2018**.
- Please explain details using the comment boxes.
- The quantity of biosolids used or disposed means the quantity that goes out the gate of your WWTP(s), even if it just goes to another WWTP. And it doesn't matter whether it is used or disposed of in or out of state.

Definitions: see the project Support page: <https://www.nebiosolids.org/nbii2definitions>

Click "Next" at the bottom of each page. That saves your answers on that page.

Need to go back? Use the "PREV" button at the bottom of each page.

Run out of time? You can start the survey & come back to it later, using the same computer.

Privacy: Unless you give permission at the end of the survey, we will ensure that your data are not reported in any way that identifies you/your facility.

Technical difficulty? Here's what the next page should look like:

**INTERNATIONAL
BIOSOLIDS
DATA
PROJECT** WWTP Biosolids Survey - 2018 Data

2. Core WWTP Biosolids Survey - Baseline Data

* 1. Enter your facility name.
If you have more than one WWTP / WRRF and the solids/biosolids are managed separately and differently, please use a different computer to enter the data for each WWTP / WRRF. But, if the solids from different facilities are managed together or in essentially the same way, just fill in one survey for all the facilities, adding their data together. Add explanations in the comment boxes. Include the names of all the WWTPs here.

* 2. State (or district or territory) in which your WWTP is located:

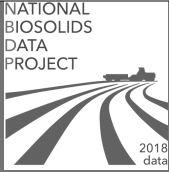
* 3. City or town:

* 4. Average daily flow in 2018 (MGD). Enter just a number (your best estimate) - no commas, ranges, or text:
Average daily flow in 2018:

- If boxes are missing or you have trouble entering data, try this:
- ensure JavaScript & cookies are enabled in your browser
 - increase or decrease font size by using browser +/- zoom controls
 - restart your browser
 - use a different browser (see [supported browsers](#))
 - be sure your system & browser are up-to-date.

These instructions are available in the PDF version of this survey; [download it](#) and keep it open for reference.

\$75 gift card RAFFLE As an extra “Thank you!”, we'll enter you in a 1-in-50-chance raffle for a \$75 gift card to a local coffee shop or eatery of your choice. Treat yourself & staff! Support your local favorite business! Your odds are good: 1 in every 50 survey respondents will win! You'll have the choice to enter the raffle or



2. Core WWTP Biosolids Survey - Baseline Data

*** 1. Enter your facility name.**

If you have more than one WWTP / WRRF and the solids/biosolids are managed separately and differently, please use a different computer to enter the data for each WWTP / WRRF. But, if the solids from different facilities are managed together or in essentially the same way, just fill in one survey for all the facilities, adding their data together. Add explanations in the comment boxes. Include the names of all the WWTPs here.

*** 2. State** (or district or territory) in which your WWTP is located:

*** 3. City or town:**

4. Average daily flow in 2018 (MGD). Enter just a number (your best estimate) - no commas, ranges, or text:

Average daily flow in 2018:

*** 5. What units do you use for sewage sludge / biosolids quantities?** Choose the one that you use usually.

- Dry U.S. tons
- Dry metric tons
- Wet U. S. tons
- Wet metric tons
- Cubic yards
- Gallons
- Other (please specify):

6. What was the **total quantity of sewage sludge/biosolids that left your facility** for use or disposal in 2018? Find the correct row(s) for the measurement units you selected above and enter your number(s) there. Leave the other rows blank. For wet measurement units, you will need to include the % solids of the sludge/biosolids. Enter just numbers, no commas or % signs.

Dry **U.S.** tons in 2018

Dry **metric** tons in 2018

Wet **U. S.** tons in 2018 and...

...average % solids

Wet **metric** tons in 2018 and...

...average % solids

Cubic yards in 2018 and...

...density and...

...average % solids

Gallons in 2018 and...

...average % solids

7. Please indicate the **quantity** (for example: U. S. tons) of the sewage sludge/biosolids from your WWTP **used or disposed in the following ways** in 2018. **USE THE UNIT OF MEASUREMENT YOU INDICATED ABOVE.** Enter just numbers (your best estimate) in the lines that apply - no ranges, commas, or text. Leave the other lines blank. Add any comments in the next question. The amounts you include here should add up to the total provided in the previous question (including "other" use or disposal).

Agricultural land application (EQ, Class A, and B):

Forestry land application (EQ, Class A, and B):

Reclamation of mine land, gravel pit, final landfill vegetative cap, other disturbed land (EQ, Class A, and B):

Class A EQ distribution to uses other than above (for example: to turf, gardens, etc.) or to unknown use/disposal. Class A EQ products include compost, heat-dried, alkaline stabilized, etc.

Long-term storage/stockpiling (for use after 2018):

Landfill (including burial and alternative daily cover):

Surface disposal (e.g. sludge monofill):

Incineration (sewage sludge incinerators and cement kiln/industrial furnace):

Transported or piped to another wastewater treatment plant (WWTP). Please tell us the name(s) of the WWTP(s) in the comment space below:

Deep well injection:

Gasification:

Pyrolysis:

Other (please describe in the next question):

8. What is the "Other" above? Or what WWTP(s) did your solids go to? Please describe:

9. Who manages the end use and/or disposal of solids/sludge/biosolids from your WWTP? Check all that apply.

- Municipal and/or utility/WWTP staff
- Handler/hauler/applier - they don't treat the solids further
- Separate preparer - they further treat the solids and change their quality. Someone who simply transports solids is NOT a separate preparer.
- Other (please specify):

10. If some or all of your solids go to a **separate preparer**, please provide the following:

Name(s) of separate preparer(s) (company name):

% of your solids that go to separate preparer(s):

Email address(es) for contacting the separate preparer(s):

11. Please indicate your **sludge/biosolids program's level of interest in a regional facility** for sludge/biosolids management:

Very important or very likely Somewhat important or likely Neutral Unimportant or unlikely Very unimportant or very unlikely

How important is it to you/your WWTP to collaborate / participate on a regional sludge/biosolids facility?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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How likely would you/your WWTP be to host a regional sludge/biosolids facility?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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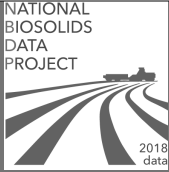
How likely would you/your WWTP be to send solids/sludge to a regional facility nearby (assuming all involved costs are reasonable)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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12. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):

* 13. In 2018, **were any of your WWTP's biosolids (Class A or Class B) applied to soils** by you/your WWTP or someone else?

Yes

No



3. Core WWTP Biosolids Survey - Biosolids Applied to Soils

1. Number of **permitted acres** that your WWTP's biosolids recycling program had available, as of 2018. If managed by a separate preparer, they should be able to provide you this information. Enter just a number (your best estimate) - no ranges, commas, or text. If none (for example: because you produce Class A EQ biosolids), put "0."

Acres **permitted** in 2018:

2. Number of **acres applied** with your WWTP's biosolids in 2018. Enter just a number (your best estimate) - no ranges, commas, or text. If managed by a separate preparer, they should be able to provide you this information. If not known (for example: because not tracked for Class A EQ biosolids), then leave this blank.

Acres **applied** in 2018:

3. What **crop(s) or other vegetation** are grown with biosolids from your WWTP? Check all that apply.

- Hay or grass for animal feed, including grazing land or rangeland
- Corn for animal feed
- Corn for energy (e.g. ethanol)
- Wheat
- Soy
- Other grains / commodity crops (not wheat or soy)
- Canola or other oil crop for food
- Woody biomass energy plants, (e.g. willow, sudan grass, etc. - not oil crops)
- Oil crop for energy use
- Vegetables for human consumption (e.g. community gardens)
- Flowers, shrubs, decorative trees
- Turfgrass (golf courses, parks, lawns, sports field, etc. - not including highway and erosion control)
- Turfgrass, other vegetation for erosion control (e.g. along highways, stream banks, construction sites)
- Turf farming (sod production)
- Fruit trees / shrubs
- Trees for lumber and/or other wood products (not for biomass energy)
- Native vegetation / natural ecosystem (e.g. at mine reclamation sites)
- Other (please specify):

4. What is the **%N (nitrogen)** in your WWTP's final biosolids product(s) leaving the gate of your WWTP or leaving your separate preparer (2018 data)? Provide just a number (i.e., don't enter a % sign). Leave blank if not applicable or don't know.

% N of our Class A product:

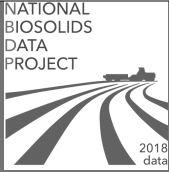
% N of our Class B product:

5. What is the **%P (phosphorus)** in your WWTP's final biosolids product(s) leaving the gate of your WWTP or leaving your separate preparer (2018 data)? Provide just a number (i.e., don't enter a % sign). Leave blank if not applicable or don't know.

% P in our Class A product:

% P in our Class B product:

6. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):



4. Core WWTP Biosolids Survey - Biosolids Quality

1. What was the **final sewage sludge/biosolids quality** produced at your facility in 2018? Enter the **PERCENTAGE (%)** of all that apply and be sure they total 100%. Provide just numbers (your best estimates) - no ranges or text or % sign.

% Class A EQ:

% Other Class A:

% Class B:

% Other, e.g., no data. Please explain in the next question:

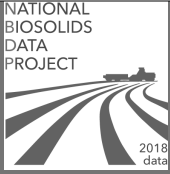
2. What is the "Other" above? Please explain:

3. In 2018, did all of the solids from your facility meet EPA's highest quality **pollutant (metals) concentration limits**, as found in Part 503 - Table 3?

4. In addition to Part 503 pollutants (for example: metals), **are your biosolids tested for any of the following (as of 2018)?** Include any testing, whether or not it is required by regulation or permit or is voluntary. Check all that apply.

- We do not test for anything more than what is required by Part 503.
- Other metals (boron, silver...)
- Dioxins/furans
- PCBs
- Priority pollutants other than Part 503 pollutants and PCBs, e.g.: pesticides, PAHs, phenols, amines, plasticizers, etc. (<https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf>)
- Other organic compounds (PBDE flame retardants, pharmaceuticals, personal care products, etc.)
- Radioactive isotopes (alpha, beta, Ra 224, TENORM, etc.)
- Nutrients
- Alum or aluminum
- Pathogen reduction (Class A and/or B)
- Vector attraction reduction (VAR)
- PFAS (as of 2018)
- Microplastics (as of 2018)
- TCLP (toxicity characteristic leaching procedure)
- Paint Filter Liquids Test
- Other (please specify):

5. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):



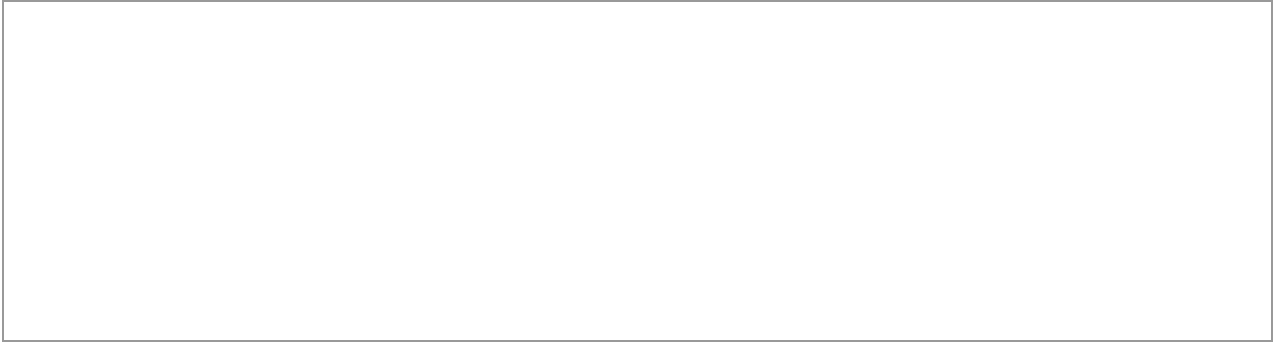
5. Core WWTP Biosolids Survey - Trends In Biosolids Management

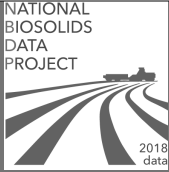
1. Please **rank the importance** of the following in decisions regarding the **management** of your WWTP's sludge or biosolids.

	Very important	Important	Neutral	Unimportant	Very unimportant - not even a consideration	N/A
Managing nutrients - such as phosphorus (P) and/or nitrogen (N) in biosolids and soils	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Net energy use - including energy savings and renewable energy production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climate concerns - greenhouse gas emissions reductions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nuisances - mitigating odors, dust, complaints	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capital costs - for infrastructure, new systems and technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operating costs - annual operating budgets, avoiding rate increases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial resources - lack of \$\$ for new infrastructure, cash flow, can't raise rates, payback required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community goals - meeting local policy goals, such as for energy, climate, costs, or quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing contaminants/pollutants - how best to address trace chemicals, metals, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capacity - trying to keep ahead of growth, ensuring enough capacity to manage sludge/biosolids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulations - meeting regulatory requirements on biosolids, effluent, air quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generating revenue - for example: by taking in septage and outside wastes, selling electricity or renewable natural gas, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited options - regulations or public pressures don't allow for one of the 3 options (application to soils, incineration, landfill disposal)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employee resources - how much can be expected of employees, training needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Core mission - cleaning water is the core mission of most WWTPs; how does biosolids management fit in?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other - please specify below	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify):

2. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):





6. Core WWTP Biosolids Survey - Thank You

1. We ask for your contact information so we can contact you if we have any questions. Your contact information will not appear in any public reports and will not be shared without your explicit consent. Providing this information is optional.

Your Name:

Email:

Phone number:

* 2. **PRIVACY:** Unless you provide permission below, your survey responses will be kept **confidential and anonymous**; they will appear only in combination with other responses or as part of large datasets (for example: all WWTPs in your state), and your facility will not be specifically identified in any public reports produced by this project.

However, we may want to highlight your WWTP's program. By answering "yes" below, you provide the National Biosolids Data Project team the option of including in public reports your specific facility's name and the associated information that you have provided. Granting this permission allows us to use your facility's name and/or identifying information as an example or case study in public reports, allowing us to highlight the variety of biosolids management programs across the U.S.

Optional:

1. If you have a photo of your program or other information that we might include in the final report, email it to ned.beecher@nebiosolids.org.
2. If you want a PDF copy of your responses to this survey, email request to ned.beecher@nebiosolids.org.

I give permission for NEBRA to include in public reports my facility's name and/or the associated information that I have provided in this National Biosolids Data Project survey. This does not include my name and contact information.

* 3. **If there is a biosolids association in my region (MABA, NEBRA, NW Biosolids, VBC, SEBA), NEBRA has my permission to share the contact information I provided above with that organization for their non-commercial use only.**

Yes

No

* 4. **Yes, please enter my name in the raffle!** I understand that I will have a 1 in 50 chance to win a **\$75 gift card** to a local coffee shop or eatery of my choice. I am able to accept this token of appreciation for my effort on this survey.

- Yes, please enter me in the raffle.
- No thanks.

7. Please complete the additional survey questions below.

Thank you! for completing the **CORE SURVEY** of the National Biosolids Survey for **2018!**

**Now please answer the following additional groups of questions:
Just keep going to the next page or choose at the bottom of this page.**

WWTP Infrastructure & Biosolids Treatment (30 mins)

These questions ask about:

- WWTP average flow (MGD)
- infrastructure improvements
- pressures on the biosolids program
- sludge storage & treatment processes
- dewatering & thickening equipment

Energy-Related Data (25 mins)

These questions ask about:

- current systems and/or future plans for energy efficiency & recovery
- anaerobic digestion
- biogas production
- pyrolysis and/or gasification

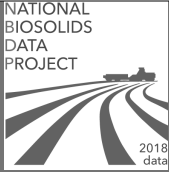
Economics of Biosolids (20 mins)

These questions ask about:

- biosolids operating budget
- biosolids use & disposal costs
- hauling distances
- tipping fees
- pricing of biosolids products
- FTEs & payroll

1. Which set of questions do you want to do next?

- WWTP Infrastructure & Biosolids Treatment
- Energy-Related Data
- Economics of Biosolids
- Back to the Instructions & Core Survey
- I've done them all!



8. WWTP Infrastructure & Biosolids Treatment

1. What is the **actual residential population** served by your facility? Do not include industrial flow equivalents. Enter just a number (your best estimate) - no commas, ranges, or text:

Actual residential population served:

2. **Permitted (or design) flow** (hydraulic capacity) of your facility (MGD). Enter just a number (your best estimate) - no commas, ranges, or text:

Permitted (or design) capacity (MGD):

3. Average **dry weather flow** in 2018 (MGD). Enter just a number (your best estimate) - no commas, ranges, or text:

Average *dry weather* flow (MGD):

4. Estimate the **volume of sludge or biosolids from other generators** received at your facility in 2018 (in gallons, wet metric tons, or wet U.S. tons). Do not include septage. Enter just numbers (your best estimate) - no commas, ranges, or text. Fill in for the measurement unit(s) that applies. Leave the other rows blank.

Gallons sludge/biosolids received in 2018:

Wet metric tons sludge/biosolids received in 2018:

Wet U. S. tons sludge/biosolids received in 2018:

5. Estimate the volume of **septage received** at your facility in 2018 (gallons per year). Do not include FOG - that goes in the next question. Enter just a number (your best estimate) - no commas, ranges, or text:

Septage received, gallons in 2018:

6. Estimate the volume of **trucked-in wastes received** at your facility in 2018 (or waste piped-in through special pipes, not part of regular sewer system). For each kind of waste, indicate how much was fed directly into the WWTP headworks and how much was fed directly into the digesters (without going through the headworks). Enter just numbers (your best estimate) - no commas, ranges, or text, in gallons per year:

Landfill leachate - put into the WWTP headworks (gallons/year):

Landfill leachate - put directly into the anaerobic digester(s) (gallons/year):

FOG - fats, oils, grease - put into the WWTP headworks (gallons/year):

FOG - fats, oils, grease - put directly into the anaerobic digester(s) (gallons/year):

Food waste - put into the WWTP headworks (gallons/year):

Food waste - put directly into the anaerobic digester(s) (gallons/year):

Industrial waste - put into the WWTP headworks (gallons/year):

Industrial waste - put directly into the anaerobic digester(s) (gallons/year):

Slaughterhouse and/or farm waste - put into the WWTP headworks (gallons/year):

Slaughterhouse and/or farm waste - put directly into the anaerobic digester(s) (gallons/year):

Other (gallons/year - describe in next question):

7. What is "Other" above? Please describe:

8. Does your facility have an **active industrial pretreatment** program?

Yes

No

9. If "yes" to the last question, **how many industrial user permit-holders** (for example: with categorical standards and/or local limits, etc.) did the WWTP manage in 2018? Enter just a number (your best estimate) - no commas, ranges, or text.

Number of industrial user permit-holders:

10. **How long does your WWTP store sludge/solids/biosolids** at the WWTP, on average? For example, how long between cleanouts of sludge storage lagoons? Or how long do compost stockpiles sit at the WWTP? Or how long is sludge or biosolids stored in storage tanks before land application?

- 0 - generally, sludge/solids/biosolids head out the WWTP gate right after they are processed (within days)
- 1 - 3 months
- ~6 months
- ~9 months
- ~1 year
- ~2 years
- ~3 years
- ~5 years
- ~10 years
- ~15 years
- ~20 years or more

Add comments:

11. Did your WWTP **extract phosphorus (P)** from the solids (for example: making struvite or similar fertilizer) in 2018? If so, how much in 2018 (dry U.S. tons)? Enter just a number - no commas or text.

Dry U.S. tons struvite or similar P fertilizer produced in 2018:

12. In what year was the **latest upgrade** (construction/replacement/improvement) for each of the following?
Enter the year. For any that are not known or do not apply, leave blank.

Thickening systems:

Anaerobic digesters (tanks):

Anaerobic digestion accessories (covers, mixers, biogas management, etc.):

Aerobic digestion:

Composting:

Alkaline stabilization:

Other stabilization:

Drying:

Dewatering:

Conveyance within the WWTP:

Transporting and applying (trucks, landspreading equipment, etc.):

Incinerator(s):

Incineration accessories (conveyances, injectors, air emissions controls, etc.):

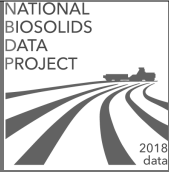
13. What do you consider to be the **top five (5) pressures** on your WWTP's biosolids management program, as of 2018? Read choices carefully and choose what fits best. Some categories, such as "agricultural issues," have more than one choice. "1" is the biggest pressure.

	1 - Biggest pressure	2	3	4	5 - Less pressure, but still in top 5
Tradition - It's difficult to change from known systems and infrastructure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tradition - WWTP isn't concerned where it goes; we just contract to have it disposed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tradition - Recycling biosolids is not a priority or part of the WWTP's core mission.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost - Disposal options are least expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost - Beneficial use options are least expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost - Rising costs generally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulations on Beneficial Use - Strict EPA and/or state regulation and enforcement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulations on Beneficial Use - Restrictive local ordinances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulations on Beneficial Use - Lack of regulatory support for beneficial use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulations on Disposal - Strict regulations or fees on disposal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public Involvement - Concerns of neighbors, environmental groups, and others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nuisance Issues - Managing issues related to odors, truck traffic, dust, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural Issues - Declining farmland due to less agriculture or due to development, sprawl, seasonal restrictions, or competition with manures, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural Issues - Soil compaction, difficulty with timing, stockpiling, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Issues - Nutrient management, phosphorus (P), nitrogen (N)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Issues - Impacts to soils, organisms, public health, contaminants (pathogens, metals, organic chemicals, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Management Issues - Securing long-term use options	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Management Issues - The hassle of biosolids recycling / land application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Management Issues - Hauling distances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify and add your rating from 1 - 5):

14. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):





9. Biosolids Treatment Practices

1. Which of the following **treatment practices** were used at your WWTP in 2018? Fill in all that apply, providing the **% (percent) of your facility's total sludge that goes to each**. Provide just numbers (your best estimates) - no ranges or text or % sign. Leave blank if not applicable or don't know. We understand that your numbers may add up to something other than 100%, because sludge may go to two or more of the following.

% of sludge to **Aerobic digestion—Class A** (ATAD or other):

% of sludge to **Aerobic digestion—Class B**:

% of sludge to **Anaerobic digestion of sludge only—Class A**, e.g. thermophilic:

% of sludge to **Anaerobic digestion of sludge only—Class B**, e.g. mesophilic:

% of sludge to **Co-digestion—Class A**, of sludge with FOG, food waste, glycol, etc.:

% of sludge to **Co-digestion—Class B**, of sludge with FOG, food waste, glycol, etc.:

% of sludge to **Lime/alkaline—Class A**:

% of sludge to **Lime/alkaline—Class B**:

% of sludge to **Composting** (if not Class A, specify in comment box below):

% of sludge to **Thermal/heat drying** (not incineration, gasification, or pyrolysis):

% of sludge to **Gasification**:

% of sludge to **Pyrolysis**:

4. **Dewatering** technology(ies) used at your facility in 2018...What percentage (%) of your facility's total sludge (primary + WAS) was processed with each of the following? Fill in all that apply and provide the % (**percent**) of your facility's total sludge that goes to each. Provide just numbers (your best estimates) - no ranges or text or % sign. Leave blank if not applicable or don't know.

% of sludge to **Belt filter press**:

% of sludge to **Plate and frame press**:

% of sludge to **Screw press**:

% of sludge to **Centrifuge**:

% of sludge to **Vacuum filter**:

% of sludge to **Drying beds**:

% of sludge to **Solar drying**:

% of sludge to **Other dewatering technology** (specify in the next question):

5. What is the "Other dewatering technology" above? Please describe:

6. **Thickening** technology(ies) used at your facility in 2018...What percentage (%) of your facility's sludge (primary + WAS) was processed with each of the following? Fill in all that apply and provide the % (**percent**) of your total biosolids that goes to each. Provide just numbers (your best estimates) - no ranges or text or % sign. Leave blank if not applicable or don't know.

% of sludge to **Gravity thickener** (i.e. tanks):

% of sludge to **Gravity belt thickener** (GBT):

% of sludge to **Centrifuge** (for sludge thickening):

% of sludge to **Dissolved air flotation** (DAF):

% of sludge to **Other thickening technology** (specify in the next question):

7. What is the "Other thickening technology" above? Please describe:

8. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):

9. Which set of questions do you want to do next?

- Energy-Related Data
- Economics of Biosolids
- Back to the Instructions & Core Survey
- I've done them all!

10. Energy-Related Data

1. Is your WWTP planning to become **energy net zero** (able to meet all WWTP energy needs by producing renewable energy from biosolids and co-processed wastes)?

- Yes
- No
- Maybe (e.g. possible long-term goal)
- We have already achieved this goal!

2. Which of the following is your WWTP focusing on mostly? Please check all that apply.

- We are not focusing on energy consumption or generation.
- Energy efficiency** in wastewater and biosolids processes (for example: air blower or pump replacements, installing more efficient boilers, etc.)
- Renewable **energy from wind, solar, tidal**
- Renewable **energy from wastewater** (capturing heat or kinetic energy)
- Renewable **energy from biosolids - anaerobic digestion & biogas**
- Renewable **energy from biosolids - pyrolysis, gasification**
- Renewable **energy from incineration** of solids
- Renewable **energy from landfilled or injected** sludge/biosolids
- Other (please specify):

3. If your WWTP has considered anaerobic digestion (AD) or has AD, please indicate your level of agreement with each of the following statements relating to barriers to your WWTP's use of biogas:

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Don't know &/or Not Applicable
Our core business objective is to produce clean water and comply with our NPDES permit. CHP is not part of our core objective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The payback on the investment is not adequate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Don't know &/or Not Applicable
Our electricity is too cheap to justify the investment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We cannot obtain an air permit for CHP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adding CHP will push us into having to get a federal Clean Air Act Title V permit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are other, more pressing needs for our limited capital dollars .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The equipment is too expensive to buy .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The equipment is too expensive to own/operate .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New equipment will require us to hire specialized operations and maintenance staff .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biogas treatment and/or CHP are too complicated .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our WWTP does not produce enough gas .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our WWTP is too small .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The required equipment does not work/will not last .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CHP will produce more CO2 and might get us into greenhouse gas trouble .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adding a "stationary combustion" device could subject us to greenhouse gas regulation .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our utility Board / Commissioners would never be willing to pay for such a costly upgrade.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We can't get the political support needed for this kind of project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The local natural gas utility is not willing to work with us , even if we clean the biogas to their standards.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our local electricity utility makes it too difficult for us to generate power onsite for our own use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our local electricity utility prevents us from easily benefiting from sale of renewable energy credits .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our local electricity utility makes it too difficult for us to sell produced renewable power back to the grid .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizing biogas would reduce our dependency on purchased heat and electricity , thus reducing our operating costs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizing biogas would reduce our "carbon footprint" (greenhouse gas emissions).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are many recent advances in gas treatments that have made it easier and safer to use biogas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some states are providing incentives for renewable energy projects, and we should be able to get a grant to help install biogas utilization systems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Don't know &/or Not Applicable
The prices of natural gas and electricity are likely to rise, and if we used biogas, we could more easily predict our operating costs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We do not know enough about the technical merits of CHP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We do not know enough about the financial merits of CHP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We have a good energy management program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety issues associated with generating biogas on-site make it undesirable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our biogas is not of adequate quality for CHP use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please explain):

4. **Annual energy generation** from your WWTP's biosolids energy recovery system(s) (megajoules/year in 2018, MJ/year). Fill in all that apply. Conversion: 1 kWh = 3.6 MJ

Electricity (MJ in 2018):

Heat (MJ in 2018):

RNG to fuel (MJ in 2018):

RNG to pipeline (MJ in 2018):

Other (please describe in the next question):

5. What is the "Other" above? Please describe:

6. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):

*** 7. Does your WWTP use ANAEROBIC DIGESTION (AD) or GASIFICATION or PYROLYSIS to treat sludge/solids?**

Yes

No

11. Anaerobic Digestion & Biogas (for Gasification & Pyrolysis, skip to last 2 questions)

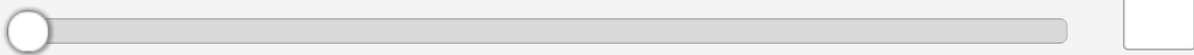
1. **Anaerobic digestion capacity in 2018** (total AD tankage available, whether being used or not, in gallons). Enter just a number (your best estimate) - no commas, ranges, or text. Enter zero (0) if no AD.

Total AD tankage capacity (gallons):

2. What percentage of the above AD capacity was in use in 2018? Move the slider to show what percentage was used.

% of AD capacity used in
2018

0 % used 100 % used



3. Does your WWTP have **excess AD capacity** that could be utilized for co-digestion of food waste, FOG, or other outside wastes?

- Yes
- No
- Maybe

4. Total quantity of **biogas produced** in 2018, including biogas used or flared (standard cubic feet, scf/year). Enter just a number (your best estimate) - no commas, ranges, or text.

Biogas produced (scf in 2018):

5. Quantity of **biogas flared** (scf/year in 2018). Provide your best estimate. You can ignore incidental biogas leakage or release. Enter just a number (your best estimate) - no commas, ranges, or text.

Biogas flared (scf in 2018):

6. How is biogas utilized? Please check all that apply.

- Not utilized. All biogas is flared.
- Heat digester(s)
- Run machinery in plant
- Used by HVAC
- Compressed natural gas used on site
- Upgraded to renewable natural gas (RNG) and injected into pipeline
- Upgraded to renewable natural gas (RNG) and used to fuel fleet or other vehicles
- Generate electricity from internal combustion engine (ICE)
- Generate electricity from turbine
- Generate electricity from microturbine(s)
- Generate electricity from Stirling Cycle
- Generate electricity from fuel cell
- Combined heat and power (CHP)
- Supply electricity to the grid
- Generate hydrogen (e.g. for transportation)
- Other (please specify):

7. If your WWTP upgraded part(s) of your AD system in the past 10 years, please briefly describe what was done and how much the project cost:

8. Quantity of SYNGAS produced from pyrolysis/gasification (scf/year in 2018). Enter just a number (your best estimate) - no commas, ranges, or text.

Syngas produced (scf in 2018):

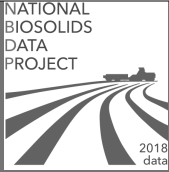
9. Quantity of BIO-OIL produced from pyrolysis or other process (gallons/year in 2018). Enter just a number (your best estimate) - no commas, ranges, or text.

Bio-oil produced (gallons in 2018):

10. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):

11. Which set of questions do you want to do next?

- WWTP Infrastructure & Biosolids Treatment
- Economics of Biosolids
- Back to the Instructions & Core Survey
- I've done them all!



12. Economics of Biosolids

1. What was your **WWTP's total operating budget for 2018** (U.S. \$)? Enter just a number - no punctuation or symbols (e.g. no \$). Your best estimate is fine, rounded to the nearest whole dollar. Count your zeros carefully!

WWTP total budget in 2018 (\$):

2. **Total cost for sludge/biosolids treatment and end use/disposal** at your WWTP in 2018 (U.S. \$). Sludge/solids treatment begins when sludge/solids are removed from the clarifiers. It includes thickening, stabilization, dewatering, transportation, end use, and/or disposal. Subtract any revenues (e.g. from sales of biosolids products). Please describe in the next question what you have included. For this question, enter just a number (rounded to the nearest whole dollar), no commas or \$ - your best estimate is fine. This might be the biosolids portion of your 2018 operating budget.

Net total cost for biosolids treatment, end use, disposal in 2018 (\$):

3. Please list **what is included in your estimate** above of the total cost of sludge and biosolids management:

4. How much does your WWTP **expect to invest in biosolids** treatment and management infrastructure in the next 5 years? Include only capital and/or upgrade and/or large maintenance projects. Do not include the costs of normal continuing operations. Provide your best estimate in U.S. \$ (rounded to the nearest dollar). Enter just a number, no commas or symbols.

New investments in biosolids in the next 5 years (\$):

5. **Average cost per wet U.S. ton or average tipping fee per wet U.S. ton** for biosolids use/disposal in 2018. Do not include hauling/trucking costs. Enter U.S. \$ amounts (rounded to the nearest whole dollar) for any of the following outlets that you use. Enter just a number, no commas or \$.

Total contracted fee for solids removal and management (average \$/wet U.S. ton leaving the WWTP gate in 2018):

Landfill tipping fee, not including hauling cost (\$/wet U.S. ton in 2018):

Incinerator tipping fee, not including hauling cost (\$/wet U.S. ton in 2018):

Land application tipping fee for farm, forest, reclamation, etc. land application, not including hauling cost (\$/wet U.S. ton in 2018):

Compost facility tipping fee, not including hauling cost (\$/wet U.S. ton in 2018):

Anaerobic digestion off-site tipping fee, not including hauling cost (\$/wet U.S. ton in 2018):

Other off-site use or disposal option tipping fee, not including hauling cost (\$/wet U.S. ton in 2018; please describe in next question):

6. What is the "Other" above? And add any additional explanations here:

7. **Transport/hauling distance(s)** to biosolids end use/disposal site(s) in 2018 - **miles one way** from WWTP. Fill in all that apply. Enter just numbers (rounded to the nearest whole mile).

Zero (0) miles because **we manage all biosolids on site**, for example: lagoon storage or compost use at WWTP (enter 0):

Average one-way distance to **landfill** (miles):

Average one-way distance to **incinerator** (miles):

Average one-way distance to **farm, forest, and reclamation, etc. land application site(s)** (miles):

Average one-way distance to **composting facility** off-site (miles):

Average one-way distance to **anaerobic digestion** off-site (miles):

Average one-way distance to **alkaline stabilization** off-site (miles):

Average one-way distance to **other off-site use or disposal option** (miles; please explain in next question):

Average one-way distance for **delivery of final product** (for example: compost) to largest customers (miles):

8. What is the "other" option above? And add any other explanations here:

9. Biosolids product pricing in 2018...What is the price charged for your WWTP's biosolids? (average U.S. \$/cubic yard or average \$/wet U.S. ton in 2018). Fill in all that apply. If the biosolids are free, put "0." If the user is paid to take them, put in a negative price (for example: -\$5). Enter just numbers, no commas or \$.

What a **wholesale biosolids compost** customer (soil broker, landscaper, garden supply center, etc.) pays for biosolids compost, \$/cubic yard:

What a **retail biosolids compost** customer pays for biosolids compost, \$/cubic yard:

What a **retail bagged biosolids product** customer pays for bags of heat-dried pellets or other biosolids, \$/typical bag of ~40 pounds/40-quarts/1.4 cu. ft:

What a **farmer/landowner** pays for **bulk Class A biosolids or ton-bags** , \$/wet or as-is ton:

What a **farmer/landowner** pays for **bulk Class B biosolids** to farms, forest, reclamation, etc. land application, \$/wet or as-is ton:

10. Septage disposal fee(s) you charge for septage disposal at your WWTP (U.S. cents/gallon) in 2018. Enter just the number of **cents per gallon** (e.g. 5), no text or symbols. Fill in all that apply:

Septage disposal fee **special pricing** (for example: for septage from in-town, etc.), cents/gallon:

Average general septage disposal fee for everyone else, cents/gallon:

11. Number of employees in your organization (WWTP) working on sludge and biosolids treatment and end use/disposal (full-time equivalents, or FTEs). Enter just a number (your best estimate) - no ranges or text. If someone works half-time on biosolids and half-time in the lab, they are considered .5 FTE for biosolids. Do not include administrative and management staff time; just include those people whose job descriptions include sludge/biosolids focus.

of FTEs on sludge and biosolids treatment and end use/disposal:

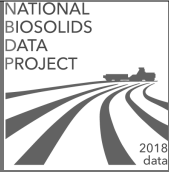
12. Biosolids payroll...Estimate the total payroll (salary and benefits in U.S. \$) paid by your organization (WWTP) in 2018 for the biosolids FTEs included in the question above. Enter just a number, no commas, ranges or text.

Total sludge and biosolids treatment and management payroll in 2018 (\$):

13. Explanations and comments on any of the questions on this page (please indicate the question number referred to, for example: "Q1: ____"):

14. Which set of questions do you want to do next?

- WWTP Infrastructure & Biosolids Treatment
- Energy-Related Data
- Back to the Instructions & Core Survey
- I've done them all!

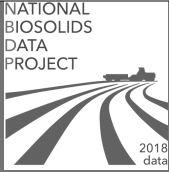


13. Privacy statement again...

* 1. **PRIVACY:** We repeat this privacy question because you have provided additional information.

Your response here overrides your earlier response. Unless you provide permission below, your survey responses will be kept confidential and anonymous.

I give permission for NEBRA to include in public reports my facility's name and/or the associated information that I have provided in this National Biosolids Data Project survey.



WWTP Biosolids Survey - 2018 Data

14. End of Survey

THANK YOU for completing the WWTP survey for the National Biosolids Data Project! We value your work, your time, and your knowledge - thank you for dedicating some of it to this national effort.

Need to make changes? You can come back any time before March 1, 2021 and make changes to your answers, using the same computer.

More about the National Biosolids Data Project at
<https://www.nebiosolids.org/national-biosolids-survey-2018-data>