Decentralized Wastewater Needs Data for the CWNS: How and Why It's Important to Your State and EPA

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What is CWNS?

- Assessment of capital needs to meet the Clean Water Act's (CWA) water quality goals

- Need: A capital project, with associated costs, that addresses a water quality or water-related public health problem

- Joint effort by EPA, States, & Local organizations

- Every 4 years as required by CWA Sec 516 (started in 1972)

- Data is submitted via the CWNS Data Entry Portal (DEP)

- Results in Report to Congress and publicly available data

CWNS & the Clean Water Act (CWA)

- CWA Sec. 516 excerpt

  "The EPA Administrator, in cooperation with the States, …shall make (a) a detailed estimate of the cost of carrying out the provisions of this Act"; (b) a detailed estimate…of the cost of construction of all needed publicly owned treatment works in all of the States…"

- CWA Sec. 205(a) excerpt

  "Allotments…shall be made only in accordance with a revised cost estimate made and submitted to Congress in accordance with Sec. 516 of this Act <u>and</u> only after such revised cost estimate shall have been approved by law specifically enacted hereafter."
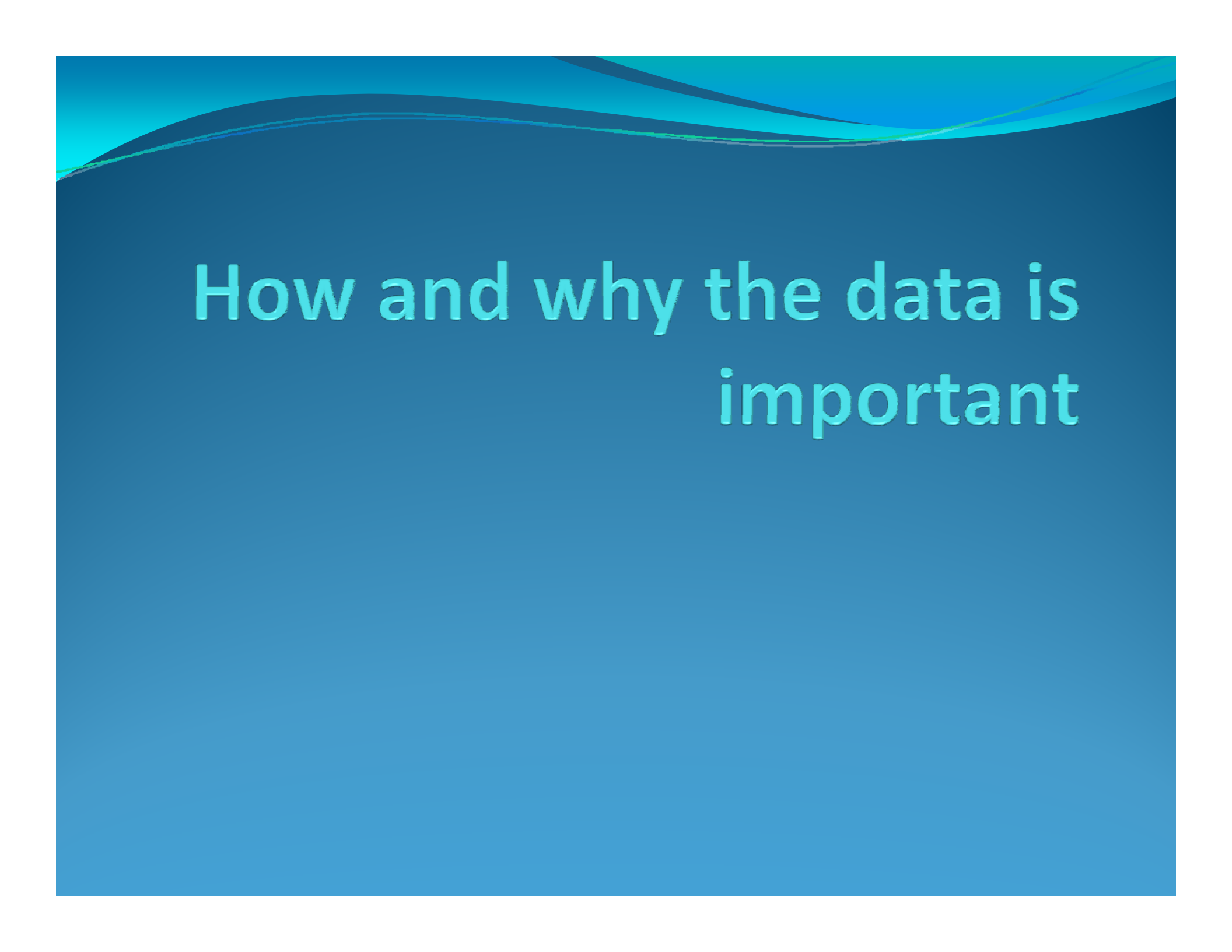
Data is entered at facility/project level

- Treatment plant
- Collection system (combined & separate)
- Stormwater management project
- Combined sewer overflow (CSO) control project
- Recycled water distribution facility
- *Decentralized wastewater treatment project*
- Non-point source pollution control project
- Pump Station

Information collected includes:

- Current documentation describing the water quality or public health problem
- Current documentation demonstrating the estimated costs
- Facility/ Project location
- Permit information (if applicable)
- Treatment plant population served, flow, effluent, and discharge information
- Decentralized and collection system population served

How and why the data is important

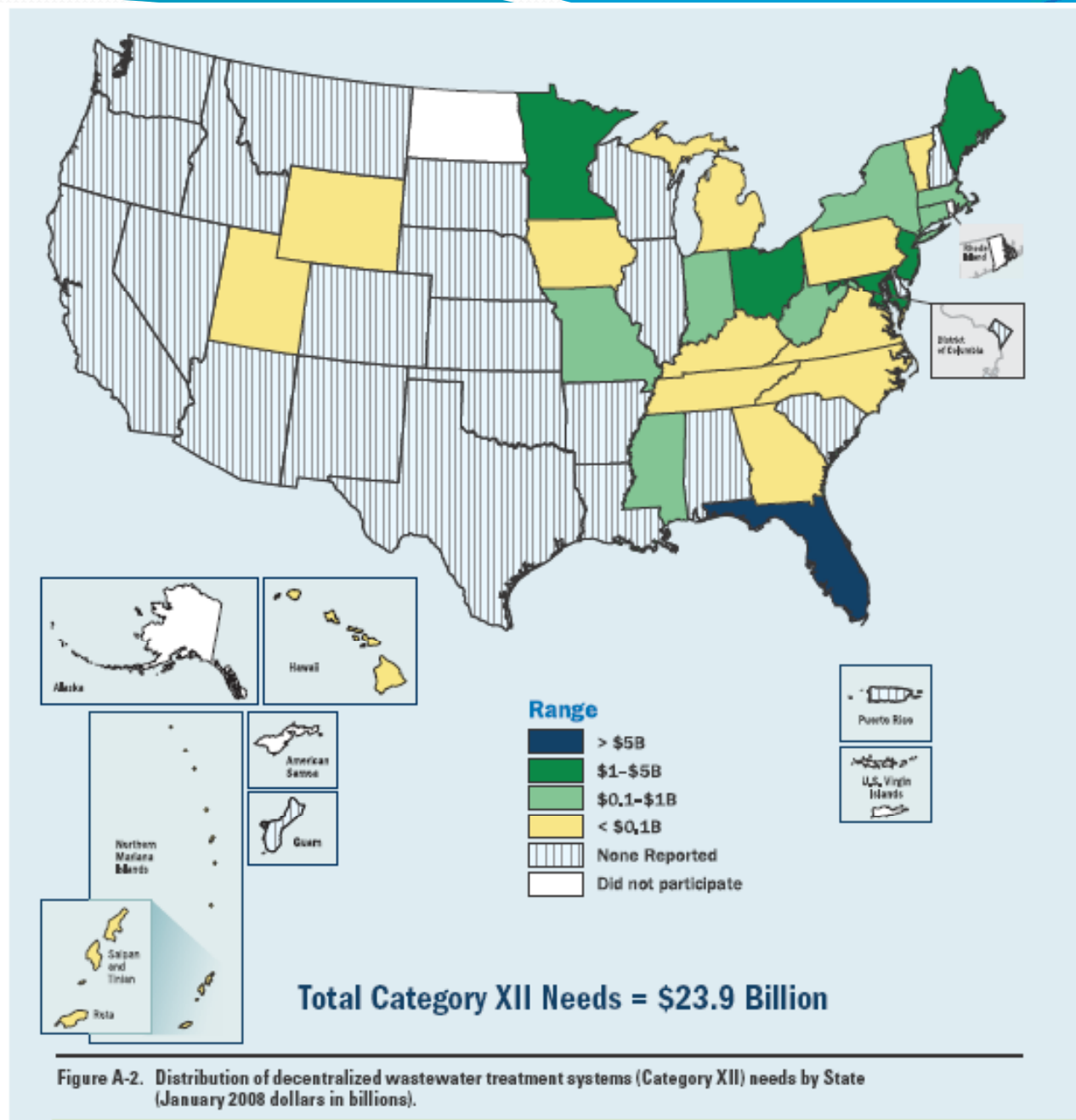# How and why the data is important

- Only national survey of needed wastewater infrastructure improvements in the country
  - Congress is authorized to use it to reallocate the SRF funding
- Data can be used to draw attention to decentralized needs
  - Decentralized needs were 7% of documented CWNS needs but only receive <1% of SRF funding assistance (2004-2008)
- Decentralized needs are underreported

Decentralized Needs in 2008

- Total need= $23.9 billion

- Increase from 2004: $20.3 billion (564%)

- 6 states (FL, MD, NJ, ME, MN, OH) accounted for 89% of the needs
  - All used innovative methods except MD
  - Result of increased coordination between the decentralized and CWNS programs

- Decentralized population served reported in CWNS = 27.9 million (~50% of current US population served by decentralized systems)

26 States reported needs

Range
- > $5B
- $1–$5B
- $0.1–$1B
- < $0.1B
- None Reported
- Did not participate

Total Category XII Needs = $23.9 Billion

Figure A-2. Distribution of decentralized wastewater treatment systems (Category XII) needs by State (January 2008 dollars in billions).

For Comparison…

Wastewater Treatment & Collection Needs in 2008

- Total need= $187.9 billion ($22.7 billion is small communities)

- Increase from 2004: $28.6 billion (18%)

- 52 states & territories

- Centralized population served reported in CWNS = 226.4 million

Collecting and Entering Decentralized Data

Decentralized Wastewater Treatment

- Managed onsite or cluster wastewater systems used to collect, treat, and disperse relatively small volumes of wastewater
- Decentralized projects may include a combination of onsite and cluster systems
- Commonly called
  - Septic systems
  - Private sewage systems
  - Individual sewage treatment systems
  - Onsite sewage disposal systems
  - Community systems

Onsite Wastewater Treatment Systems (OWTS)

An individual onsite wastewater treatment system is a system relying on natural processes and/or mechanical components, that is used to collect, treat and disperse or reclaim wastewater from a single dwelling or building.
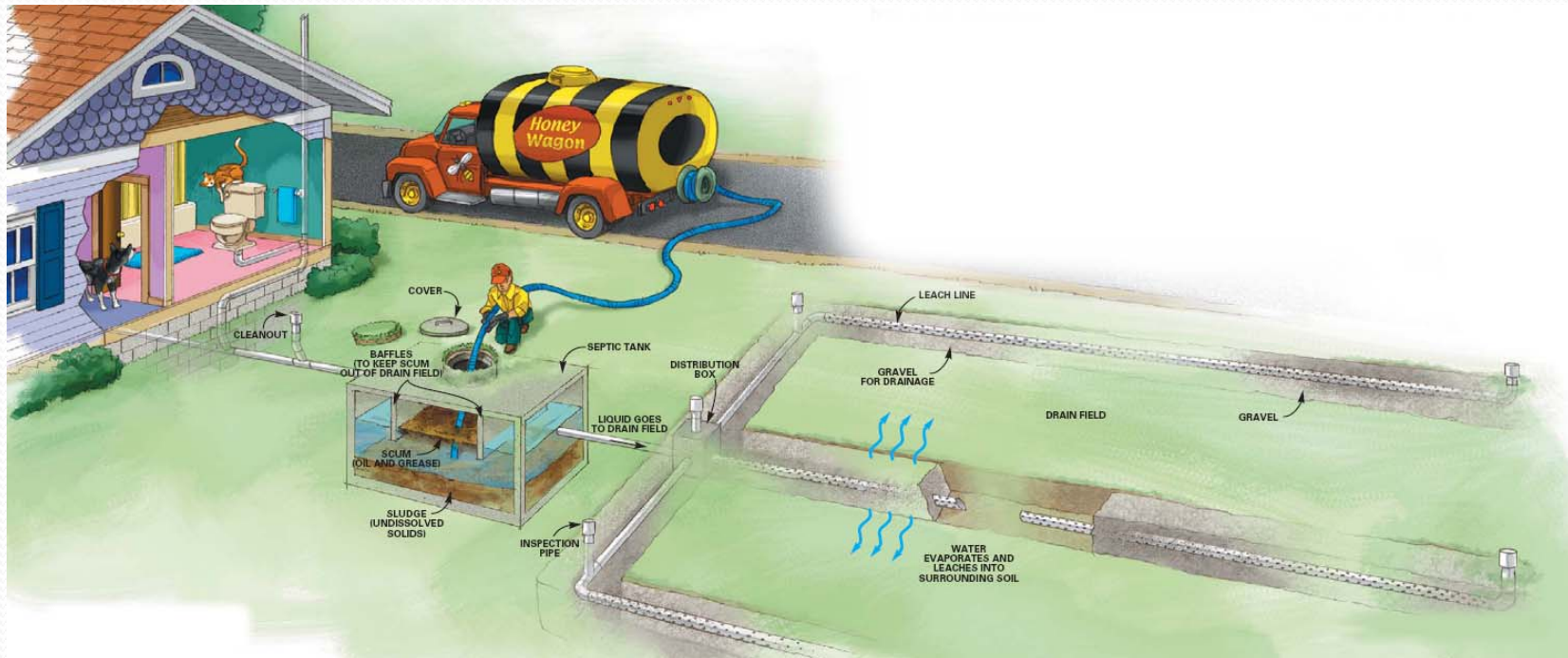
Cluster Systems

A cluster system is a wastewater collection and treatment system under some form of common ownership that collects wastewater from two or more dwellings or buildings and conveys it to a treatment and dispersal system located on a suitable site near the dwellings or buildings

Category XII: Decentralized Wastewater Treatment Needs

- Costs associated with the construction of new systems, or the repair or replacement of existing decentralized wastewater treatment systems including:
  - Clustered Systems
  - Onsite Wastewater Treatment Systems (OWTS)

Other Relevant Categories

- When the solution to a decentralized systems problem is to connect the area to a centralized system:
  - Needs to construct a publicly owned centralized collection and treatment system are reported as Category I-Secondary Wastewater Treatment and/or Category II-Advanced Wastewater Treatment
  - Needs to install sewers to connect the service area to an existing collection system are reported as Category IV-A-New Collector Sewers and Appurtenances and IV-B- New Interceptor Sewers and Appurtenances

Seven Criteria for Documenting Needs and Costs

- Description of the water quality or public health problem   } **Needs**
- Location of the problem
- Solution to the problem
- Cost of the solution   } **Costs**
- Basis for the cost
- Total cost
- Current Documentation

1. Description of the water quality or public health problem

- Examples:
  - Complaint issued
  - Surveys
  - Studies/ information from similar communities
  - Implemented municipal or state regulation
  - Permits issued

Surveys

- Surveys can be done as part of an existing effort or created for CWNS

- "Model survey" for CWNS is available

New Jersey Department of Environmental Protection
Division of Water Quality
Bureau of Nonpoint Pollution
Onsite Wastewater Management Program
P.O. Box 029
Trenton, NJ 08625
(609) 292-0407
www.state.nj.us/dep/dwq/sep_site.htm

Onsite Wastewater Annual Report

2004

Contact Information

Heath Official Name:	Phone Number:
Health Department Name:	E-mail:
Municipality:	

Permit Information - Permits issued between January 1, 2004 and December 31, 2004.

New System:	
Repair:	
Alteration (expansions):	
Alteration (malfunctions):	
Alternative Technology:	
Commercial:	
Other Permits (explain on separate page):	
Complaints:	

Repair / Alteration (malfunction) Explanation – Total number

Ponding/breakout onto the ground:	
Backup of sewage into residence:	
Failed home inspection:	
Select fill clogged:	
Other:	

Nature of Repair or Alteration – Total number

Tank:		Connecting Line:	
Baffle:		Bed:	
Riser:		Trenches:	
Distribution Tank:		Pump:	
Dosing Tank:		Other:	

Information from Studies of Similar communities

- CT used studies conducted in two typical communities in the state
  - Village centers
  - Lakefront/ oceanfront developments
- Based on studies, extrapolated results to like communities across the state
- Number of homes in each community identified using mapping

Example State Regulation

- From Maryland:
  - SB 554 is the Chesapeake Bay Nitrogen Reduction Act of 2009 (the Act) that established new requirements for on-site sewage disposal systems within the Critical Area. The Act, effective October 1, 2009, requires a nitrogen-reducing unit (NRU) in place of a septic tank where a repair, replacement, or new on-site sewage disposal system installation is made and applies to permit applications for septic tanks, drainfields, drywells, sand mound systems, pressure dosed beds and any other type of on-site sewage disposal system on a property in the Critical Area.

Permits Issued

- From statewide or county databases or study, collect data on the number of rehabilitation and replacement permits issued in the County by year

- Find the average number of repair and replacement permits for the last five years for each county

- Florida, Maine, NJ used variations of this method

2. Location of the problem

- Clustered System
  - For a single system, a single latitude/longitude point (centroid or front door)
  - For multiple systems, the town or city where the systems are located

- OWTS
  - Indicate the town(s) served by OWTS; "unincorporated area" within a county will be an option

3. Solution(s) to the problem

- Possible solutions
  - Construct new system(s) (where there previously was no system; new construction)
  - Repair existing system(s)
  - Replace existing system(s)
  - Upgrades to innovative/advanced treatment

Predict Solution based on Existing Data

- Use a survey, study, or an existing database to document the typical number of repairs, replacements, and/or new systems in a time period and geographic area

- Extrapolate results to 20-year time horizon and/or similar areas across the state

What if you don't know the solution

- Assume the solution is to repair the existing system (with no significant alterations to system) if no documentation exists on need to replace it or upgrade to an innovative/ advanced treatment system

4. The cost for each solution

- A cost is required for each proposed solution.
- Generally, separate costs for at least:
  - Repairs
  - Replacements
  - New systems
  - Innovative/advanced treatment

5. The basis of the cost

- The source of the cost data, for example:
  - Engineer's estimates
  - Permits
  - Costs from comparable practices
  - Equipment supplier or installer's estimates
  - Cost Curves in CWNS DEP

Costs from comparable practices

- Cost must be based on at least 3 bid or completed projects that are:
  - Recent: within the last two years.
  - Similar in size, scope, and geographic area.
  - Size: plus or minus 25 percent.
  - Generally in the same county or watershed.

- Must be pre-approved by EPA headquarters

Engineer, installer, or equipment supplier's estimates

- A good source of cost data

- MN example:
  - Conducted survey at recertification workshops (309 installers)
  - Asked for actual installation cost of four basic systems
  - Developed a weighted average installation cost

Cost Curves

- Available in data entry system:
  - All OWTS (mixture of conventional and innovative systems)
  - Conventional OWTS (traditional gravity-fed tank and trench system)
  - Innovative OWTS (any type of OWTS with technology superior to a conventional OWTS)
  - Clustered systems

7. Current documentation

- $\geq$$30 Million: More recent than January 1, 2006
- <$30 Million: More recent than January 1, 2002

Lessons Learned in 2008

Resources

- State and municipal health departments
- Permits and permit applications
- Engineers and installers
- Historical knowledge & data
- State agencies & departments addressing rural issues
- Research by outside organizations (e.g., Universities, associations of cities and towns)
- State NPS program and 319 watershed plans

Communication

- Communication is key
  - Between state agencies
  - Between state and local agencies
  - Between states and EPA

- Contact EPA as you are developing your methodology.
  - EPA will provide methodology review at states request from now until March 2012

CWNS 2008 Innovative Methods & Model Survey

- In CWNS Portal Library at:

  My Workspaces > CWNS > Library > 2012 Innovative Methods > Approved 2008 Innovative…

- States that used innovative methods:
  - Florida
  - Connecticut
  - Maine
  - Minnesota
  - Missouri
  - New Jersey
  - Ohio
  - New York

Clean Watershed Needs Survey New Jersey's Innovative Approach

Bureau of Nonpoint Pollution Control
NJ Department of Environmental Protection

Onsite Needs

- OWTS (under 2000 gpd)
  - Individual systems
  - Local construction approval
  - Predicting how many systems will fail or built new
  - No unified state database

- Decentralized (over 2000 gpd)
  - Cluster systems
  - State operating permit for quality
  - State construction approval
  - Unified state database

OWTS Needs

- Municipalities considered management districts

- Failure rate and new construction rate determined from surveys

- Used cost curves

- Result is municipality's yearly average Need which was used in the 20 year projection

The Needs Survey

CWNS Data Field	New Jersey's Translation
Facility	Municipality
Point of Contact	Mayor
Phone number	Phone number for City Hall
Address	Address for City Hall
Latitude/Longitude	Associated with Municipality location
Watershed	Watershed in which City Hall is located
Population	Calculated as per the CWNS database
Cost	Cost Curves
% of Municipality on septic	Based on sewer service area maps
Category of System	Systems recorded as rehabilitation or new

OWTS Needs

- Population - 3 people per household multiplied by number of repair and alteration permits
- Flow - Number of repair and alteration permits multiplied by flow for 3 bedroom home (assumed based on average 3 people per home)

Decentralized Needs

- Two categories: primary treatment and secondary/tertiary treatment
- Evaluated trends to identify if could predict more than one repair
- Costs developed per gallon treated
- New construction based on applications in progress

Successes

- Ability to evaluate 20 year projection
- Cost curve was close to limited engineer estimates

Challenges

- Calculating % area served by owts using sewer service area GIS coverages

- Used cost curves for repairs due to insufficient engineer estimates

- Costs for new owts based on mean of estimates then averaged within regions

- Needs for new owts needed to be grouped by county because database could not have new and repairs in same facility

The Future

- Focus on Barnegat Bay
  - Data used to determine higher concentration areas for onsite
  - Data will be used to develop appropriate options for upgrades
- Used in discussions for onsite funding, both nationally and locally

Thank you

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Contacts & Resources

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- **RESOURCES**
- **Clean Water Needs Survey: www.epa.gov/cwns**
- **EPA Decentralized Program: www.epa.gov/owm/septic**
- **Registration for Septic Wiki**
  - **https://ssoprod.epa.gov/sso/jsp/septicWikiLogin.jsp**