THE Onsite Journal

SPECIAL CONFERENCE ISSUE, SEPTEMBER 2020

MEGA-CONFERENCE GOES VIRTUAL

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NOWRA
National Onsite Wastewater Recycling Association

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A NOTE FROM THE PRESIDENT

"It was the best of times, it was the worst of times…."

Carl Thompson, President

I still flash back to my ninth grade English class exam; anxiously sweating while writing an essay on the meaning of the line penned by Charles Dickens to open "A Tale of Two Cities". We are now in another anxiety-ridden time when so many things are right and so many things are wrong. I feel tremendously lucky that my family is healthy and that we have been able to spend time together walking the dogs, watching movies at our makeshift drive-in movie theater on the backyard deck, and kayaking while remaining socially distanced from others. I am extremely grateful to be working in our onsite industry that seems to be thriving now (at least as I write this in July) as pent-up demand for home-building comes back after a pandemic-related pause and existing onsite systems need service and upgrades due to sequestering-in-place overloads.

I am excited to hear that the onsite industry will likely grow further as people will want to move from apartments in urban areas to residences with more space in the suburbs and rural areas (that will more likely use onsite wastewater infrastructure). These "best" situations have been offset by the worst. Many in our communities have lost their jobs. Many have become sick and the number of coronavirus-related deaths is shocking. On top of all the job losses and sickness, I have been saddened and disheartened to learn of multiple instances of racial injustice.

As I think about the "best of times" I feel honored to have been involved in the work of NOWRA. So many people have worked so hard to advance our industry. In the past few months we have been able to make significant steps toward our goals. Our NOWRA online learning platform is seeing more and more use and we will be able to share tens of thousands of dollars in online learning revenue with NOWRA state affiliates. More great coursework on system troubleshooting will be added to our online platform this year.

The rebuild of our new NOWRA website is also underway and progressing nicely. It will be ready to launch with a new "Septic Locator" functionality later this year. We have also made great progress with new federal legislation. The Senate and Environment Public Works Committee has completed its markup of S. 3591 – America's Water Infrastructure Act of 2020 (AWIA 2020). This legislation could greatly increase funding for onsite system repairs and replacements. It authorizes up to $50 million in grants for FY 2021 and FY 2022 to replace and repair malfunctioning onsite systems. While the pathway for this is paved in the Senate, there is still work to do to gain support for this bill in the House of Representatives. Stay tuned.

I am sure that you are also experiencing some best and worst times. Thank you for the work that you do to support our essential wastewater infrastructure. Your work might just help reduce some of the worst times for others. Please be safe.

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STATE AFFILIATE NEWS

NOWRA Welcomes New State Affiliate

The latest state onsite organization to join NOWRA is the newly formed North Dakota Onsite Wastewater Recycling Association.

Prior to last year, there was no onsite wastewater association representing professionals in North Dakota. Then Tom Schimelfenig got involved. Tom is a lifelong North Dakotan who has been installing and repairing septic systems for decades. Well connected with fellow professionals from around the state, Tom heard a good deal of frustration from his colleagues regarding what they saw as outdated state regulations regarding septic systems and inconsistent application of the regulations which were in place.

But Tom is a doer. Realizing that the situation for North Dakota professionals was unlikely to change unless they had a voice of their own, Tom reached out to NOWRA headquarters for assistance in forming a state association to represent the interests of its onsite wastewater professionals.

While NOWRA was pleased to provide advice and guidance to help the fledgling organization get off the ground, Tom did most of the heavy lifting – creating a steering committee to help go through the process of forming the organization, submitting paperwork to the state and to the IRS, and developing their bylaws and membership types. The first organizational discussion took place in early 2019 at an event sponsored by the North Dakota Department of Health. Response to his proposal was well received and within a few months the organization took shape, formally joining NOWRA in early 2020.

Tom wasn't done, however. In addition to helping to found NDOWRA, he led NDOWRA's effort to reach out to the state legislature on behalf of the organization in order to effect changes to benefit onsite industry professionals. The goals were twofold: update the existing rules governing installation and management of onsite systems and create a board of industry stakeholders to provide oversight of professional conduct and to resolve disputes between regulators and industry professionals.

While the final outcomes of their efforts aren't likely to be realized until the state legislature's 2021 session, Tom and other NDOWRA members have traveled frequently to the state capital to participate in hearings, working groups and discussions on legislative strategy. Tom and his colleagues have built strong relationships with many members of the legislature, and Tom is optimistic that his efforts and those of his NDOWRA colleagues will result in better conditions for the state's onsite wastewater professionals.

Tom Schimelfenig owns Schimelfenig Excavating in Bowdon, North Dakota. Tom has been in the water and sewer industry for 43 years. He and his father started a water well business in 1976. In 1978 he went to into the water and sewer underground. He has been an onsite water and sewer contractor in the state since 1987. He serves on a Tech Review Board in North Dakota with regulators and contractors in onsite wastewater systems. In his role as the President of NDOWRA, he has been closely involved in making changes to health departent codes to make it statewide and fair for all. He serves as an Installer representative on the NOWRA Board, and his term expires in 2022.

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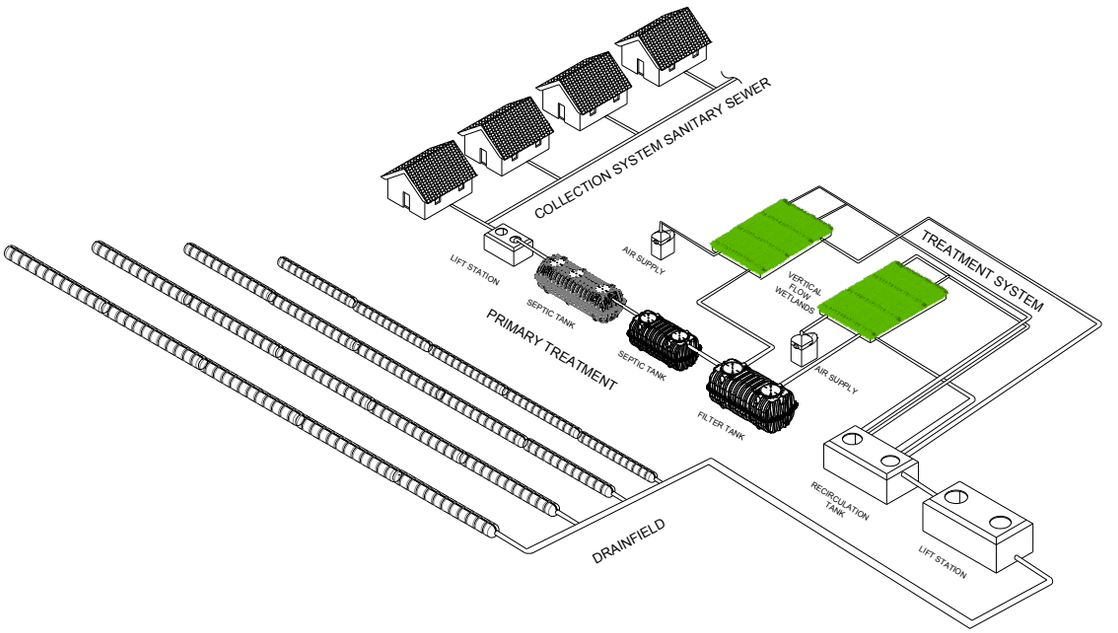


LARGE WASTEWATER TREATMENT SYSTEM DESIGN AND MANAGEMENT

by Dennis F. Hallahan, PE, Technical Director, Infiltrator Water Technologies

More restrictive codes with the goal of protecting vulnerable environments are pushing engineers and developers to present wastewater treatment solutions for large commercial projects that can meet permit treatment levels, perform long term, contribute to sustainable development, and not directly impact the community's wastewater treatment system capacity.

To accomplish this, decentralized wastewater treatment systems that can handle flow rates of more than 1 MGD are being designed and implemented for large-scale municipal and commercial wastewater projects across the United States and Canada. While decentralized systems have, and will continue to serve the rural areas outside city limits, the notion that the decentralized system is only there to serve small, single family homes has been transformed with these large decentralized systems.

What is decentralized wastewater treatment?

Decentralized treatment is the collection, treatment, and dispersal of wastewater at or near its point of origin that is an alternative to gravity sewer and Wastewater Treatment Plants (WWTP). These systems can work independently or in concert with the centralized WWTP system if there is one in place.

With the technologies and O&M infrastructure available, many engineering firms are offering their services in this new niche. Large businesses and communities no longer need to wait or pay exorbitant tap fees to tie-in to existing centralized services. Consultants with decentralized experience can perform feasibility studies reviewing options for their clients, and the decentralized solution may yield the most beneficial cost position. Finding less cap-

ital extensive solutions that can extend the life and expand the capacity of existing centralized systems is also a high priority in communities open to smart sustainable development but that have aging or undersized wastewater treatment plants.

A little history

Before 1997, people outside of the decentralized community thought of decentralized wastewater treatment systems as a temporary solution until the "big pipe" came to their area. However, the US EPA broke down this misconception in 1997 with their "Response to Congress on the Use of Decentralized Wastewater Treatment Systems." Among other things, it stated: "Adequately managed decentralized wastewater systems are a cost-effective and long-term option for meeting public health and water quality goals..."

Benefits

Decentralized wastewater treatment reduces watershed impacts and increases water reuse. These systems can be built on land not accessible to public sewers or infrastructure and can be phased in as part of a holistic phased-in community or commercial development plan. This economically-sustainable model can lower life-cycle costs of wastewater treatment for communities and commercial development.

A combination of approaches

Many communities are turning to a combination of approaches to solve their wastewater treatment challenges. These systems often provide decentralized collection that moves to a centralized treatment facility and then to a large disposal field. Most of these systems are centrally managed decentralized wastewater treatment systems, such as publicly- and privately-owned community systems, and are staffed with trained and educated personnel in the same manner as centralized systems.

Challenges

To bring decentralized treatment to the forefront nationwide requires public education and an informed design community. Most wastewater treatment regulations are local or state based, however local codes may not recognize soil as a treatment medium even when a lack of funding for centralized systems is a challenge for municipalities that need expanded wastewater treatment services.

System Components

There are five major components of most large decentralized systems:

1. Facility Type
2. Collection
3. Treatment
4. Disposal
5. Operations and Maintenance (required)

In many cases, the lines can be blurred between the description of large decentralized systems and the centralized model; and the components are the same.

1. Facility Type: Decentralized treatment facilities can be new, repair of an existing system, or expansion of existing community systems. In each case, design flow is based on the anticipated usage. Peak flow events and hours of usage (continuous, seasonal, weekday, weekend) are factored in to determine the design flow. Calculations can be made based on metered data or estimated usage and proper peaking factors must be applied.

2. Collection System Types: The collection system can be the same as a centralized sewer system. Systems can be gravity, shallow pressure sewer, or vacuum systems, but in every case the system must be watertight. Gravity and shallow systems should be placed above the water table whenever possible. All efforts must be taken to reduce/eliminate Inflow and Infiltration. This is the bane of all centralized systems because it causes regular uncontrolled overflows.

In the case of residential systems, STEP Systems are increasingly popular. Most systems include one or more septic tanks that provide primary treatment. And, like the collection system, it is critical that the tank be watertight.

The Top Three Reasons for Watertight Tanks

- Leaking-in: Water (outside from surface or ground water) entering the tank will cause hydraulic overload of the drainfield system and/or may flush solids out causing the drainfield to be plugged
- Leaking-out: untreated water can pose a health threat to surface or groundwater
- Cracks or open seams allow for roots to penetrate and expand openings

Advances in manufacturing process related to plastic tanks have resulted in increased strength and durability over the tanks of the past. The manufacturing process allows the inclusion of corrugations and

ribbing to strengthen the tank. Interior structural bulkheads can be included to increase the strength of the tank.

3. Treatment: Technology has advanced with the availability of treatment at the decentralized level. All of the same technologies that are available for centralized systems are now available for smaller scale decentralized systems: extended aeration, sequencing batch reactors, membrane bioreactors, and the list goes on. Manufacturers work with designers to provide turn-key system designs that are specific to the facility type and to meet the regulatory permit limits.

4. Discharge, Dispersal, and Recharge Criteria: Many regulatory authorities allow direct discharge to surface waters for decentralized systems. If no surface discharge is available, then the system can be designed with subsurface disposal. Soil application rates for large flow decentralized treatment systems typically reference the onsite codes for the related state or province. What method is specified typically depends on the following:

- State/Provincial approval
- Cost (materials and labor, O&M)
- Soil type
- Facility type (peak flow event facility)
- Location: under parking, golf course, farming

A thorough site and soil analysis by a qualified expert will yield an application rate. Groundwater or other design concerns may also require a groundwater mounding analysis. The disposal system size can get very large due to the high flows, in which case disposal areas can be broken up into smaller sub-sections or zones. This allows the system to fit the site topography better, minimizes pump sizes, and offers more options for operations and maintenance. Each State and Provincial code varies the sizing credit based on bottom area and/or sidewall.

5. Operations and Maintenance Professional Management: Recognizing the need to advocate advanced wastewater treatment systems of a scale that will support positive development, these systems need to be professionally managed. Professional management provides control on the quality of the wastewater treatment process. Many existing utilities are available or interested to provide the O&M services as a Reliable Management Entity (RME).

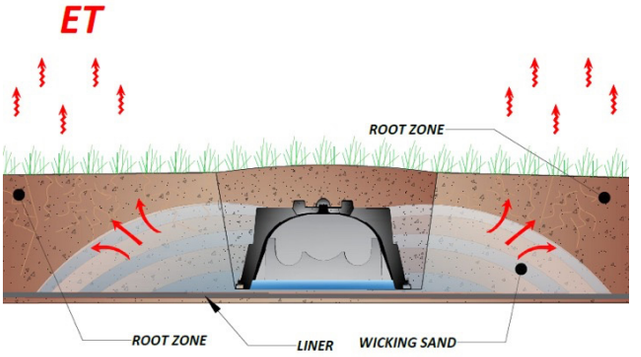
The need for a solid O&M plan is also necessary for the disposal system. Some considerations include flushing the lines for pressurized systems. To account for freezing in cold climate, or slime build up in warmer climates, the lines can be designed to drain out after each cycle. The designer should provide details for proper O&M in the plans and specifications, such as monitoring ports to allow the inspection of ponding heights and plumbing valves to separate zones. Additionally, as part of the O&M plan, the surface of the disposal field should be inspected quarterly to look for erosion, rodent activity, surface drainage, and vegetation.

Case Study: Bluewater Lake State Park, New Mexico

Innovative evapotranspiration system reduces nitrogen and BOD challenges

Summary

New Mexico's 3,000-acre Bluewater Lake State Park in the Zuni Mountains sits at an elevation of 7,550 feet with access to the 1,200-acre Bluewater Lake. The park offers camping, boating, hiking, birding, horseback riding and fishing and features bathrooms, showers and a RV dump station. The original two septic systems handling wastewater from the park were compromised and not operating properly and the leachfield was clogged due to high strength BOD and thus required replacement.



The physics of evapotranspiration

Challenges

A New Mexico Environment Department (NMED) program evaluates state park campgrounds for nitrogen concerns and reviews for cost-effective handling methods for RV and

park waste. Conventional disposal trenches were not an option due to the nitrogen concerns. Other challenges included a geology of fractured rock, lack of soil cover, and discharge of nitrates to groundwater. O&M costs were also a concern in selection of a system and design.

System details

The 4500-GPD hybrid 3-tank system designed features a new 20,000-gallon, 3-chamber tank which includes the pump tank, aeration tank, and a pump chamber to reduce the BOD that is typical of RV waste from formaldehyde additives commonly used for odor control. Two positive displacement blowers cycle on and off every 40 minutes 24/7. While peak season is summer, the system operation remains constant year-round. An evapotranspiration (ET) bed with Infiltrator Quick4 Plus High Capacity Chambers is low pressure dosed and fully lined to protect the lake from nitrogen contamination. New Mexico's climate is ideal for the combined effects of evaporation from soil and transpiration from plants for wastewater disposal. Wicking sand was specified to pull water upward via capillary action for utilization by the plant root structure or to evaporate into the atmosphere. The system is covered with sandy loam/topsoil and planted with native species and salt tolerant grass.

Result

Regulators were pleased with the system design and operation and recommended a similar approach for future sites. Maintenance will include routine pumping of the septic tanks and routine filter cleaning. The ET bed system needs little to no maintenance.

Case Study: Rowan, Iowa Municipal System

Engineered Decentralized Wastewater Treatment Systems Help Iowa Town to Comply with Community Challenges

Summary

The City of Rowan, Iowa had existing onsite septic systems that were non-code compliant. Some were surface discharging and others were within water good setbacks. The Iowa Department of Natural Resources (IDNR) had been in talks with the Rowan officials for years to develop a plan to move toward wastewater compliance.

Challenges

Rowan had no available land for a lagoon and the cost of a compliant wastewater treatment solution along with locating a system was an ongoing challenge. Setbacks, pumping distances, and farmers unwilling to sell land for a system location had stalled the process. Iowa Department of Natural Resources (IDNR) requires Iowa communities have engineer designed sewer systems. They can't discharge into field tiles as most discharge into creeks. This impacts aquatic life and can impact cities that draw from river water for public water use.

System details

A customized, engineered solution was designed by Veenstra & Kimm of West Des Moines that includes 50 individual, conventional, code-compliant onsite systems that discharge to chamber drainfields, 16 pump-to-gravity systems that discharge to chamber drainfields, eight Advanced Treatment Systems that discharge to chamber drainfields, and 17 STEP to a chamber cluster system drainfield systems. A total of 50 septic tanks, eight pretreatment units, 32 pump tanks, 20,400 linear feet of Infiltrator chambers, and 6,000 linear feet of 1 ½" force main were utilized for the systems.

The conventional gravity systems are 2-compartment Weiser cement septic tanks with Infiltrator Quick4Plus Standard LP chambers. The step to conventional gravity systems are 2-compartment Weiser cement septic tanks with submersible effluent pumps to Infiltrator Quick-4Plus Standard LP chambers. The pretreatment Orenco AdvanTex systems are 2-compartment cement septic tanks with submersible effluent pumps to Infiltrator Quick4Plus Standard LP chambers. The step to cluster systems are 2-compartment Weiser cement septic tanks with submersible effluent pumps to Infiltrator Quick4Plus Standard LP chambers located at two different cluster fields, which includes 4200 feet of chamber at one field and 900 feet of chamber at the other field.

Result

Contractor, Mort's Water Company of Latimer, worked closely with the wastewater engineers to layout the systems designs as they installed the systems over a 12-month period. Future system maintenance was considered in all system designs and installations.

Backfilling the Rowan project

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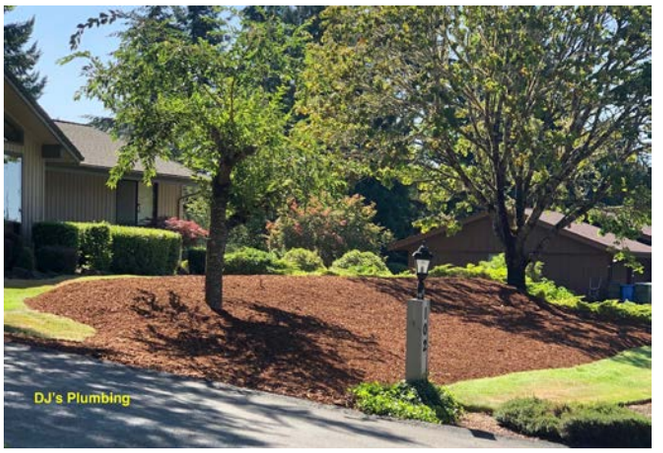

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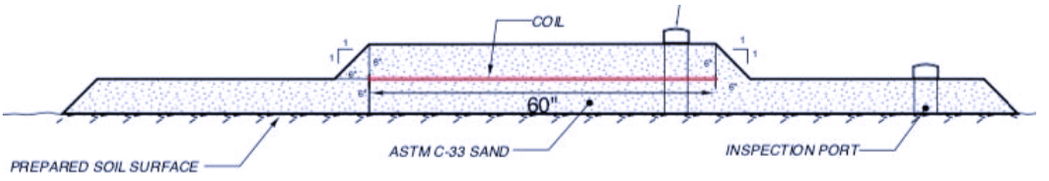

Because of the at-grade nature of the *OSCAR* it requires the least soil depth and area mandated by state codes. *OSCAR* can be combined with other technologies to achieve tertiary treatment levels with little or no soil.

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email dave@lowridgetech.com.

Conclusion

Many aspects of decentralized wastewater treatment systems are similar to centralized systems and in some cases both approaches are used to provide the best solution for communities. Planning is key to a successful community project that is effective and cost efficient for residents and businesses. Where homeowners are involved, communication is key to helping them understand the need and the benefits of the systems being recommended. This is often done via public meetings. Where large commercial systems are involved, engineers need to dovetail the needs of the development or system owner and those of the community to design the most effective and seamless solution for sustainable development. Decentralized treatment is an effective wastewater solution for many large projects, but each project is different and it's key that they be reviewed objectively to ensure it is the right choice for the application.

About the Author

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Dennis Hallahan has over 30 years of experience with onsite wastewater treatment systems' design and construction. Currently Technical Director at Infiltrator Water Technologies, he is responsible for technology transfer between Infiltrator and the regulatory and design communities and consults on product research and testing for universities and private consultants. Hallahan received his M.S. in civil engineering from the University of Connecticut and his B.S. in civil engineering from the University of Vermont. He is a registered professional engineer in Connecticut and holds several patents for onsite wastewater products.

2020 ONSITE WASTEWATER MEGA-CONFERENCE GOES VIRTUAL

Sometimes the best laid plans don't materialize. Such was the case with our vision of bringing 600 or more people to Hampton, VA this October for the 2020 Onsite Wastewater Mega-Conference. Everything was on track and then COVID-19 hit.

It has been said that the pandemic has changed everything. That certainly applies to the Onsite Wastewater Mega-Conference, which will now be an all virtual event. As of press time, the final dates had not yet been selected. The conference will continue to be a joint effort, as NOWRA is teaming up with its local partner VOWRA (Virginia Onsite Wastewater Recycling Association) and national partners SORA (State Onsite Regulators Alliance), and NAWT (National Association of Wastewater Technicians).

We made the decision to move the conference to an all-virtual format when it became apparent that our ability to hold the conference in Hampton and attract people to attend was very uncertain. The Tidewater area of Virginia (where Hampton is located) saw a significant spike in new cases in early summer, which prompted Governor Northam in late July to roll back public gatherings from 250 people to 50 people. It suddenly became unclear whether we would have a facility in which to hold the Mega-Conference.

In addition, NOWRA conducted a survey of likely participants in this year's conference to better understand our members' interest in attending. The survey generated a good response. It indicated that roughly two-thirds of people who responded indicated that they would not attend, or were unsure about whether they would attend. The primary concerns were related to the general increase in cases of COVID-19 across the country and in the Commonwealth of Virginia.

With the safety of our members being our top priority, we made the difficult decision to not hold the Mega-Conference in Hampton this year.

While the decision to cancel our event was a difficult one, the 2020 Virtual Onsite Wastewater Mega-Conference will be a valuable and useful event for participants, and offers several key advantages:

- You will save time. You won't necessarily need to take time from your work in order to attend the educational sessions which interest you.
- You will save money. You won't

need to stay in a hotel or incur travel costs. Plus, conference registration fees will be lower.

• Flexibility. If you sign up for the full conference or one of the conference packages, you will be able to access the sessions as they are happening or up to a year after that if some session times don't work for you.

• The education will still be first rate. The format may have changed, but the high quality of the sessions offered won't change. Our conference education team still reviews and approves all presentations for content before they can be presented at the Mega-Conference.

The Mega-Conference is the largest national conference focusing directly on decentralized and onsite wastewater treatment. It brings together industry professionals from all over the country to learn and share information in ways that not only benefit those in attendance but the industry as a whole.

Should you attend the Virtual 2020 Onsite Wastewater Mega-Conference? Absolutely yes when you consider some of the benefits of attendance:

• Earn CEUs to meet your licensing requirements. The Mega-Conference planning team will still reach out to states around the country seeking their approval of our agenda. You should check back regularly at the Mega-Conference website (www.nowra.org/2020mega) for updates on which states have approved credits, which have not, and which are still in the works.

• Get training for you or your employees – Lots of good training can be found in the conference educational lineup.

• Generate ideas to make you and your organization grow – Whether it's through insights gained in the classroom or ideas exchanged with colleagues in less formal settings, chances are you'll get a handful of ideas you can begin to implement.

• Gain a competitive edge – Useful and innovative programs and activities can be found in all corners of our industry. Bringing them together at a national conference presents you with a tremendous opportunity to find new ways to stand out from your competitors who don't attend.

• You'll have a chance to speak with industry vendors. We are planning a Virtual Expo as part of the conference, and many companies have already indicated they plan to

Although the conference won't be in person this year, attendees can still benefit from the wealth of knowledge to be shared in our virtual sessions.

participate in the Expo.

• Get a big picture view of our industry – Get a better understanding of the trends and directions of the onsite industry. Onsite wastewater technology is being deployed in new ways to address water issues around the country. Staying current with these trends can help you identify future opportunities or challenges.

If any of these reasons to attend apply to you, you should plan to participate in the Mega-Conference. Visit NOWRA's website (www.nowra.org/2020mega) for more details on conference registration, education, CEUs, exhibitors and much more.

USDA'S NEW RURAL DECENTRALIZED WATER SYSTEM GRANT/LOAN PROGRAM

A new source of funding for repair and replacement of malfunctioning onsite systems

In December of 2018, Congress passed a major Farm Bill. Among its many provisions was one which provided for a brand new source of funding for homeowners using septic systems. Beginning in 2021, homeowners will be able to apply for low-interest loans to repair or replace malfunctioning septic systems. Here are the details about that new program and what you need to know to take advantage of this program.

Background

Several years back, a loan/grant program was established at US Department of Agriculture to assist rural homeowners in need of funding to repair or replace a failing residential well. Known as Household Water Well System Grants, this program distributed grants to qualified local, state, and regional nonprofit organizations. These grants would be used to establish mini "revolving fund" programs within the nonprofit to provide low interest loans to homeowners.

In 2018, as the Farm Bill was being written in Congress, Senator Corey Booker (D-NJ) introduced language which expand the Household Water Well System Grant program to include the ability to provide loans for the repair and replacement of malfunctioning septic systems. Sen. Booker's legislation also increased the annual funding authorization from $5 million to $20 million per year for the next five years. Under his legislation any homeowner with a household income which was less than 60% of median household income of a state's rural population qualifies. NOWRA worked closely with RCAP – the Rural Community Assistance Partnership) to support the senator's efforts. NOWRA members and its lobbying team reached out to numerous Members of Congress to get their support for this legislation. Our efforts paid off when the language was included in the final version of the bill passed by Congress.

How the program works

The money appropriated by Congress does not go directly to homeowners. Instead, the money is distributed, in the form of grants, to nonprofit organizations who apply to participate in the program. To qualify, the nonprofit must demonstrate the capability to make and service loans, and the expertise and experience to promote 'the safe and productive use of individually-owned decentralized water systems and groundwater."

The goal of the grant program is to establish ongoing revolving loan funds within each qualified nonprofit organization for the purpose of financing decentralized water and wastewater system loans. The nonprofits are encouraged to also secure additional funds from other sources.

The nonprofit is the entity responsible for distributing the grant funds to homeowners in the form of low-interest loans. To qualify, the applicant must be a homeowner, and the combined household income must be less than 60% of the median non-metropolitan household income of the state or territory in which the individual resides.

The interest rate of loans extended under this program may not exceed one percent (1%) and may not exceed a term of 20 years. The loans can be up to a maximum of $15,000 for each water well or septic system. In certain, very limited circumstances, the money distributed may be in the form of a subgrant directly to the applicant.

When will the funding become available?

The revised regulation was completed in April of 2020 (You can see a copy of the full rules by visiting NOWRA's website: www.nowra.org/advocacy, and clicking on the link which says "USDA.") The agency has told NOWRA that they will send out a Request for Applications to interested nonprofit organizations in January 2021. The deadline for applications will be in May 2021, and monies should be released to successful applicants before September 30, 2021. At that point applicants wishing to apply for a well or septic system loan may begin to reach out to the appropriate nonprofit.

Program limitations

Relatively limited amount for funding. Although this program was authorized for up to $20 million in funding each year, at press time it appears as though Congress will only appropriate $5 million for 2021. In practical terms this will work out to a few hundred loans nationwide. Many of those loans will be for residential wells. This

suggests that if you want to help your low-income clients take advantage of this program, you will need to act quickly.

Not all areas of the country are expected to be covered under this program. For someone to receive a loan they will need to located in a geographic area served by one of the nonprofits selected for funding under this program.

NOWRA anticipates that several regional nonprofits organized under the RCAP umbrella will be among the successful applicants to this program. In 2019, when the program only covered residential wells, three of RCAP's seven affiliated regional organizations took advantage of the program: the Great Lakes Community Action Partnership (Great Lakes RCAP), the Southeast Rural Community Assistance Project (Southeast RCAP), and the Rural Communities Assistance Corporation (Western RCAP)

If I have clients who might qualify for this program, how should I proceed?

Reach out to the regional RCAP office serving your state and ask if the organization intends to apply to participate in the Rural Decentralized Water System grant program for Fiscal Year 2021. If they do, ask how you can be kept informed about how to apply for a loan under this program and try to gather any necessary forms that your client will need to complete.

If your regional RCAP does not intend to participate in this program and cannot suggest another nonprofit which operates within your client's geographical area, contact NOWRA, who will assist your efforts to locate an appropriate nonprofit. Contact the nonprofit and request that they consider applying for a grant under the Rural Decentralized Water System program. If the nonprofit does not have adequate experience assessing loans for septic systems, and you feel you have the qualifications to do so, offer your services as a consultant who can help assist with evaluation of plans, maintenance issues (or suggest a nearby qualified onsite wastewater professional).

NOWRA ROLLS OUT NEW ONLINE TRAINING

10 new courses to help you troubleshoot onsite system problems

NOWRA recently introduced its latest collection of training courses to its Online Installer Academy – the association's online learning platform. These courses add to its library of training courses, which include the installer training curriculum and the NOWRA Onsite Wastewater A to Z training curriculum.

Like those courses, the Troubleshooting courses feature a mix of video, training slides, reading materials and other media to deliver the educational content. They also feature one or more brief quizzes which the user must pass in order to complete the course. Upon successful completion of the course, the user receives a certificate which can be submitted to the appropriate authorities as proof of completion.

Several of NOWRA's State Affiliates are also offering courses on the Online Installer Academy education platform. TxOWA (Texas Onsite Wastewater Association) leads the way with 20 online courses in its library. WOSSA (Washington On-Site Sewage Association) has two courses on the platform, while MSO (Missouri Smallflows Organization) and VOWRA (Virginia Onsite Wastewater Recycling Association) each have one course.

A helpful alternative to face-to-face education

While in-person education offers many benefits which cannot be replicated with online education, the Online Installer Academy platform is nevertheless a good substitute when it is not possible to attend face-to-face training events. It is especially useful for:

- Training new employees who are unfamiliar with onsite wastewater treatment systems
- Regulators with responsibilities for septic system inspections and permits who are new to their position. (The National Environmental Health Association notes that the second most common responsibility of Health Department professionals is oversight of onsite systems. However, most environmental health professionals receive little training in this area.)
- Professionals who need to earn continuing education credits when in-person training is not possible.

Below is a list of states where the Installer Training and Onsite Wastewater A to Z courses are approved.

State Approval	A to Z	Installer Training
Delaware	Yes	Yes
Georgia	Yes	Yes
Indiana	Yes	No
Maine	Yes	Yes
Massachusetts	Yes	Yes
Missouri	Yes	Yes
Nebraska	Yes	No
New Hampshire	Yes	Yes
Oregon	Yes	Yes
Virginia	Yes	Yes
Washington	Yes	Yes
Wisconsin	Yes	No

These courses are also approved for continuing education credit by NAWT (National Association of Wastewater Technicians) and NEHA (National Environmental Health Association). If your state is not on this list, you should contact your state's licensing or certification office to determine if your state will grant continuing education credits for these courses.

A win/win for professionals and their state associations

Taking one of NOWRA's national courses benefits you and your state onsite association (if they are a NOWRA Affiliate). When you sign up for a class, your state association receives 30% of the revenue, right off the top. This extra revenue helps them control costs and offer new services. In addition, for courses developed by a State Affiliate, they receive the bulk of the revenue – 70%.

The following courses are included in the Troubleshooting Course curriculum:

Troubleshooting Changing Water Flows

This class will focus on a study funded by the Water Research Foundation evaluating water use from over 23 utilities and over 1,000 homes. Residential indoor water use in single-family homes has decreased. The average per household daily water use has decreased 22 percent, from 177 gphd in 1999 to 138 gphd in 2016. The primary sources for the reduction will be discussed along with implications with increased concentrations. Mandated reductions in toilet flush and clothes washer volumes and shower and faucet flow rates have contributed to the declines in residential water use. When water usage decreases the concentrations of contaminants including organic material and nitrogen increases. Septic system design and operation considerations will be highlighted.

Troubleshooting Septic Tanks Part 1

This class will discuss aspects and methods for troubleshooting tanks of various materials. It will also discuss troubleshooting the performance of tanks, such as system back up into the home from clogging due to various factors: roots, poor slope

on inlet piping, bends, or possibly pipe settling. Field inspection methods will be discussed. Other issues to review: proper pumping intervals, sludge and scum depths, surface drainage, tank siting/location, backfill settlement and tank settlement.

Troubleshooting Septic Tanks Part 2

This class continues discussion of aspects and methods for troubleshooting tanks of various materials.

Troubleshooting Media Filters

This class will describe the design concepts of both natural and artificial media filters. The key difference between media filters and other advanced treatment systems is that the beneficial microorganisms are physically attached to the media. Performance of media filters is both robust and resilient under normal conditions, but extra care should be taken to ensure toxic substances are kept out of the waste stream. A sequential inspection checklist (such as that provided by the CIDWT) prompts the operator to examine and collect all the information necessary to troubleshoot a media filter system. A detailed examination of the mechanism for delivering effluent to the filter surface is usually a key inspection point during media filter troubleshooting. Various models use gravity or pressure to deliver an equal liquid dose to the filter surface.

Microbiology in Advanced Treatment Systems

Advanced systems are usually installed in areas with significant soil and site limitations. This talk will start with a discussion of site and soil conditions that leads to decision to install an advanced system. Detailed discussions on various processes that go on in a typical advanced system treatment train will then follow. Particular attention will be given to microbial processes that affect the fates of organic particulates and of contaminants nitrogen, phosphorus, and pathogenic bacteria as they move through the system.

Troubleshooting of Mechanical Treatment Systems

This class will cover the basics of "Standard 40" rated systems and how they can be expected to perform in the field. The presentation will cover the common mechanical components (aerators, blowers, diffusers, pumps, etc.) and controls and how to troubleshoot them to ensure that these are in proper working order. Even though the system may be sized and "mechanically" sound, systems can still fail to perform. Review the most common failures, such as hydraulic & biological under and overloading, inhibitory chemicals/compounds, homeowner intentional and unintentional abuse/neglect and other topics.

Troubleshooting Pumps and Controls

This class will address issues when troubleshooting systems that incorporate pumps and controls. It will cover the three most used pumps in our industry, how they work and how they differ depending on their application. Pumps can fail for a variety of reasons, including sizing the pump. It is important to know how pumps should be chosen to help determine the reason for failure. Some of the basic rules of troubleshooting will also be covered. There are many different types and styles of control panels on the market today and learning to troubleshoot all of them would be impossible in a one-hour class, but there are some basic practices and procedures that apply to all panels which we will cover.

Troubleshooting Soil Treatment Systems

Troubleshooting soil treatment areas (STA) is a complex process as essentially all of the components of the STA are not visible and accessible for assessment or measurement. Principles for troubleshooting STA will be discussed. Essential initial inputs include: any permits for the system as well as the soil-site assessment; history of the home/business site development; surrounding and neighboring development that could influence the hydrology of the site; past and current use of the onsite wastewater system; troubleshooting of upstream components of the onsite wastewater system as well as the activities the home owner or business manager have placed on top of the STA. Once an assessment of current and past use status has been developed, intrusion into the STA through probing, coring, and/or digging will need to be performed to "ground truth" the problem. Examples will be provided to illustrate many of the common causes of poor performance of the STA of onsite wastewater systems.

System Failure Identification

This class will focus on the definition of a failed system and what is needed to document that failed system. The class is broken into two distinct discussions. The first discussion is on the signs of failure to include drain field saturation, spongey soil, odors, frequent pumping, back-ups, system alarms and algae blooms in water sources. The second discussion is on the steps taken to conduct the system investigation. We will discuss typical investigation equipment to include probes, augers, and other equipment. The presentation includes some of the more interesting events seen in the field to include oil coming into a septic tank, pump chambers misdiagnoses, questionable electrical practices and more. The end result of this class is to document the reasons system failure investigation is so important and what the documentation of the failures means to our researchers.

Drain Field Malfunction

The class will review methodologies to review and inspect problem site systems. The intention is to have the presentation serve as a learning tool on the potential causes, how to investigate, and recommending the proper solution once the problem is identified. The presentation will review malfunction investigation basics, septic tank investigation, the function of the tank, drain field investigation, and malfunction issues and examples.

To take advantage of any of these courses or any other online courses offered, visit NOWRA's website –www.nowra.org/online, or go directly to the online platform: www.pathlms.com/nowra.

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