THE LITTLE DIGGER

MOWA minnesota onsite wastewater association

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A bi-monthly publication

2016 MOWA Convention Preview—

The Onsite Wastewater Industry and Our Carbon Footprint

by Jessica L. Kautz, 2016 MOWA Keynote Presenter

Jessica L.Kautz,Project Engineer, Infiltrator Water Technologies,LLC, will make be a keynote presenter at the 2016 MOWA Convention to be held January 26-28, 2016 at River's Edge Convention Center in St. Cloud. The following is the abstract for her presentation.

Why do you do what you do? Why are you in the decentralized wastewater industry? I joined the wastewater industry to interact directly with society and protect public health. I joined the decentralized wastewater industry because it is the most environmentally-sound, passive form of wastewater treatment and recycling.

But what is truly saved by using decentralized wastewater treatment? And what can we do as an industry to help negate the growing environmental and fiscal problems facing society today?

The environmental and economic benefits provided through the manufacture and construction of onsite (decentralized) wastewater systems versus centralized wastewater treatment plants were quantitatively examined through an analysis of embodied energy, embodied carbon, and the cost of each system type. The average decentralized system versus connecting to a sewer extension were found to reduce embodied energy, embodied carbon, and cost by 75% (117,538 MJ), 73% (5,099 kg CO2,), and 68% ($12,636) respectively.

...it is imperative that local, state, and national regulators shift the focus of wastewater treatment from centralized sewer systems to the more sustainable decentralized model...

With the clear environmental and economic benefits associated with decentralized wastewater treatment systems, it is imperative that local, state, and national regulators shift the focus of wastewater treatment from centralized sewer systems to the more sustainable decentralized model. Doing so will greatly aid in the efforts to reduce the carbon footprint associated with development as well as reduce the cost of

Onsite Industry & Carbon Footprint, *Continued on Page 12*

"Onsite Installer" Features Minnesota On-Site Professional Bob Billiet

Bob Billiet, owner of Mid MN Septic Services in rural Hutchinson was featured in the September issue of "Onsite Installer."

Billiet reflects on what it takes to grown a business during challenging economic times, evolving regulation, and changing customer demands while planning for retirement!

Impossible?

Check out the "rest of the story," by going to Page 4.

In this Little Digger

REGISTER SOON FOR 2016 MOWA CONVENTION!

2016 MOWA Convention & Exhibitor Showcase

THE MINNESOTA ONSITE WASTEWATER ASSOCIATION

MOWA

PROUDLY ANNOUNCES ITS

2016 ANNUAL CONVENTION AND EXHIBITOR SHOWCASE

JANUARY 26TH – 28TH, 2016

RIVER'S EDGE CONVENTION CENTER

10 - 4th Avenue, So. – St. Cloud, MN 56301 320.255.7272

http://www.stcloudriversedgeconventioncenter.com/

Registration Coming Soon

Contact MOWA for details:

MOWA, 5200 Willson Road, Suite 310, Edina, MN 55424, (952) 345-1141

mowacarla@aol.com / www.mowa-mn.com

Upcoming Panel Discussions For MOWA Conference

By Gregory Halling, Professional Engineer and Advanced Designer and Inspector

We are excited to again be offering three panel discussions in 2016 at the MOWA Conference which will be held in St. Cloud on Tuesday, January 26th through Thursday the 28th. This year will be similar to last year so we will have two hour panels with combined ISTS professional categories.

The panels are ***LGU and Inspector*** panel led by Marilee DeGroot and Pete Otterness, ***Maintainer and Service Provider*** panel led by Wayne Johnson and the ***Designer and Installer*** panel led by Greg Halling. The panels will be on Wednesday and Thursday and do not overlap with each other in case there are some who would like to attend all three panel discussions.

Once again we will have several questions to discuss but encourage input from the audience and hope to have good discussions with the experts in our field of expertise.

We believe it is very valuable to get the input from other practitioners as each one has experiences that can affect and help improve our industry as well as each company's bottom line.

Each question to be discussed will relate to Mn Rules 7080 so that the sessions will be eligible for continuing education credits.

This year the topics will range from what is your greatest hurdle with design or installs, septage incorporation, O & M contracts, O &M tips, venting in tanks, who is responsible for what, can we install filters without risk, what are LGUs requirements for operating permits, what about enforcement, and can we get all the LGUs on the same page. We look forward to seeing you at this year's conference in St. Cloud.

From the Executive Director's Office

By Pat Martyn, MOWA Executive Director

It always gets exciting when the convention time rolls around! Our annual great Minnesota septic industry get together is coming up on January 26 through the 28th, 2016, at the River's Edge Convention Center in St. Cloud, Minnesota. In this issue of the Little Digger you'll find some information about the show. We are really excited about the prospect of a great event.

This year's convention will feature another Minnesota Roe-d-Hoe that produced a national champion in 2013! You could be crowned the state champion for this year! Everybody always emphasizes the benefits of attending. We repeatedly get very high marks for the content of the show. It's your opportunity to mingle with friends and colleagues in the industry, catch up on news, or just have friendly conversations, and also earn some continuing ed credits.

The Convention Committee has been working for months on the content of the show and this ensures the best speakers and the best topics available for presentation on issues that are directly related to you and your business. At the tradeshow, the best products available will be showcased by reputable vendors who will be at the show to display their wares, describe them to you, and sell them if you are interested. At the very least, they are there to generally inform and explain and enhance your knowledge about the industry.

The Minnesota Pollution Control Agency, our primary state regulator will be there, and this presents an opportunity for you to visit with our state regulatory authority. In addition, the MPCA will present timely topics and will be doing their usual great job of informing the industry.

As usual, we pay close attention to the comments you make in your evaluations. Each year, we gather the evaluations of the show and try to incorporate them into the next year's planning. Our panel format is a direct outcome of attendee recommendations.

Also, this is the time that your Association explains the ins and outs of what happened during the year and if you want to play a more involved role in the board decision making process, let us know. If you're interested in running for a spot on the board of directors, we are always looking for a few good people to fill the post of departing board members. See you at the convention!

Calendar of Events

MOWA Events

January 26 – 28, 2016— Annual Convention & Tradeshow – River's Edge Convention Center – St. Cloud, MN (visit www.mowa-mn.com for details)

Industry Events

February 17 – 20, 2016— WWETT - Water & Wastewater Equipment, Treatment & Transport Show at the Indiana Convention Center – Indianapolis, IN (visit http://wwettshow.com/ for details)

The ***LITTLE DIGGER*** is a bi-monthly publication of the Minnesota Onsite Wastewater Association.

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The articles printed in the publication do not necessarily reflect the opinion of this organization. Readers are encouraged to respond to the articles with their own points-of-view. We welcome industry-related comments or articles. Information or inquires should be sent to any of the following: MN Onsite Wastewater Association, 5200 Willson Road, Suite 310, Edina, MN 55424 Phone: (952) 345-1141 Toll Free: 888-810-4178 Website: www.mowa-mn.com

Billliet, *Continued from Page 1*

Minnesota's Bob Billiet weathers seasonal slowdowns, rocky economic times and changing customer demands to grow a business … just as he's planning for retirement.

Winter is more than a seasonal inconvenience for Bob Billiet, owner of Mid MN Septic Services in rural Hutchinson, Minnesota. It has influenced the course of his life.

"Typically, we have six or seven months to earn 90 percent of our income," says Billiet. "While thawing frozen onsite systems or pumping tanks puts some work on the service board in winter, it doesn't generate sufficient revenue for a small enterprise like ours to retain trained help."

Over the company's 23-year history, Billiet has earned every license necessary to help sustain or grow the business: designer, installer, pumper, inspector, maintenance provider, real estate broker and appraiser, and plumber.

Winter also gave the company a fluid profile, exacerbated by a sometimes unstable economy. The only constant has been Billiet's guiding presence, but that is about to change as he approaches retirement.

Finding A Niche

Early on, Billiet operated a real estate company, then worked as a real estate appraiser. That didn't make for steady work. "I was laid off whenever the market took a downturn. It happened frequently and I had a family to feed," he recalls.

Brother-in-law Dan Crotteau, who owned a local plumbing and heating company and was expanding into onsite installations, suggested Billiet design systems for him. Billiet took installer and design/inspection courses at the University of Minnesota, joining Crotteau in 1992.

Soils in the area are wet loam, clay loam and clay with pockets of sand and loamy sand. "Then and now, 80 percent of new and replacement systems are mounds, with the remainder advanced treatment units or inground trenches with gravelless chambers," says Billiet. "Our niche is 450 to 600 gpd residential systems." The company's only commercial install was a winery.

The work suited Billiet. He bought out Crotteau in 1997 and registered the business as Mid MN Septic Services. With only two pumping companies in a 20-mile radius, Billiet saw an opportunity to grow the business by becoming a septic first responder. "Many callers had sewage backing into their basements," he says. "We introduced ourselves through pumping, then offered a replacement system."

In 1998, Billiet purchased a 1993 Kenworth T600 chassis and added a 3,000-gallon Imperial steel tank and Masport W15X pump. Business boomed. He hired four employees and bought a pre-owned 2000 Sterling vacuum truck with 4,500-gallon steel tank and Wittig pump. Then winter would arrive.

The Cold Snap

Laying off workers and hoping they would return in spring didn't sit well with Billiet, since training replacements takes two years. "One winter I kept two salaried employees," he says. "There wasn't enough work and I had to borrow money to meet payroll." The decision also led to one of the company's worst periods.

Searching for ways to survive the lean months, Billiet branched into plumbing, purchased 20 Five Peaks portable restrooms and hired a master plumber to supervise the new divisions. Both of the new service areas stalled, and four years after opening the branches, he sold them.

Billiet, *Continued on Page 5*

Billiet, *Continued from Page 4*

By 2005-06, the company had recovered and saw its revenue peak. “We were averaging 10 new mound systems and 40 to 50 replacement systems annually,” says Billiet. “For comparison, we installed two new systems and replaced 20 failed ones in 2014.”

The low numbers reflect more than an economic backwater. Last May and June were some of the wettest on record, with rainfall totaling almost 13 inches. “We didn’t install our first system until July 8,” says Billiet.

Most replacements involve failed inground trenches or illegal tile field systems. Where possible, Billiet installs ATUs to rejuvenate drainfields. “When the Minnesota Pollution Control Agency approved Nayadic and Multi-Flo units from Consolidated Treatment Systems, we were one of the first in McLeod County to adopt the technology,” he says. Today, Billiet is a Consolidated distributor in four counties and maintains 40 service contracts.

Working Lake Country

While most replacement systems have challenging elements, lake lots with steep grades test the mettle of Billiet’s crew and machines. Besides poor soils, setbacks often leave only 5 feet between houses and property lines. “Typically, we install an ATU in the front yard, which faces the lake, and pump to a new drainfield in the backyard,” he says.

Another part of the problem began 30 to 40 years ago when developers filled all the ravines with fill soil, then built houses or cabins on them. “Those are some of our most challenging sites,” says Billiet. “The ravines still drain groundwater, and we never know what debris we’ll hit during excavation.”

Besides a 1992 John Deere 310D tractor/backhoe, Billiet has a 2014 Kubota SVC75 track loader, a 2013 Kubota KX080-3 excavator and a BX25 tractor/backhoe.

The fleet also includes a 1986 Mack dump truck with a Brehmer box, a 1987 Ford dump truck, a 1999 Freightliner F70 dump truck, a Chevy express van, a Dodge pickup, two homemade open flatbed trailers, a 20,000-pound Ehrl open flatbed trailer, an Alra open flatbed trailer, and two enclosed trailers: one by Look Trailers and the other by Carry-On Trailer. Dale Brenhaug, full-time foreman, and a part-time summer laborer comprise the crew.

“The small equipment works really well on these lots,” says Billiet. “We often have to tie off the excavator so it doesn’t roll into the lake, support it with another piece of equipment, then build a pad from which to dig the tank holes.” He prefers Infiltrator Water Technologies tanks and chambers for such projects.

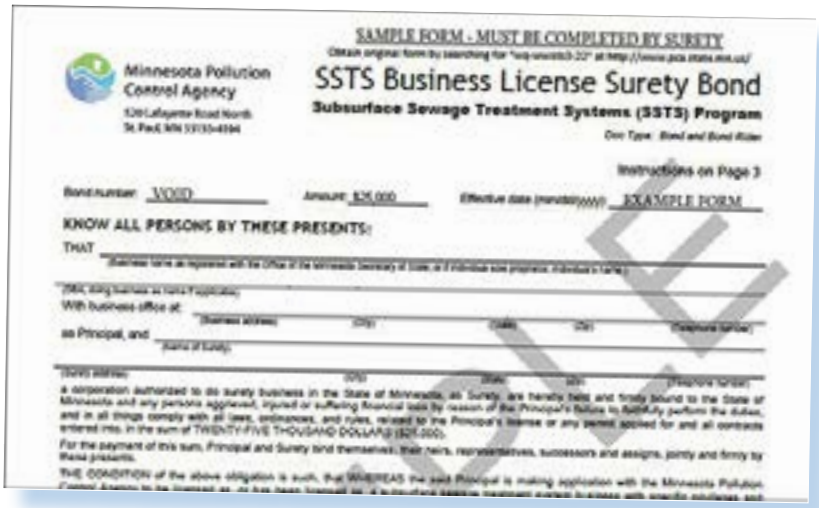
Billiet, *Continued on Page 6*

Nov. 20th deadline on Surety Bond for Licensure

Installers, check your mail for surety bond requirement information

By the MPCA

The MPCA is sending customized packets to every Minnesota licensed SSTS Installer to help them comply with the 2015 Legislative changes to surety bond requirements. Packets were sent recently. Please respond by Nov. 20, 2015, to avoid a lapse in your SSTS Installer License on Jan. 1, 2016.


SAMPLE FORM - MUST BE COMPLETED BY SURETY

Minnesota Pollution Control Agency

SSTS Business License Surety Bond

Subsurface Sewage Treatment Systems (SSTS) Program

Instructions on Page 3

Bond Number: VOID Amount: $25,000 Effective date (mm/dd/yyyy): EXAMPLE FORM

KNOW ALL PERSONS BY THESE PRESENTS:

THAT

With business office at:

as Principal, and

a corporation authorized to do surety business in the State of Minnesota, as Surety, are hereby held and firmly bound to the State of Minnesota and any persons aggrieved, injured or suffering financial loss by reason of the Principal's failure to faithfully perform the duties, and in all things comply with all laws, ordinances, and rules, related to the Principal's license or any permit applied for and all contracts entered into, in the sum of TWENTY-FIVE THOUSAND DOLLARS ($25,000).

For the payment of this sum, Principal and Surety bind themselves, their heirs, representatives, successors and assigns, jointly and firmly by these presents.

THE CONDITION of the above obligation is such, that WHEREAS the said Principal is making application with the Minnesota Pollution

The good news is that unless you are a plumbing contractor, you don't need to register with the Department of Labor and Industry (DLI). You do, however, need to update your surety bond and demonstrate your pipe laying credentials to the MPCA. You only need to do this once, where you had to do it every two years with DLI.

Non-Installer SSTS License holders will need to update their surety bond at their next renewal. Contact Jane Seaver at the MPCA at 651-757-2711 or ssts-info.pca@state.mn.us with questions about these legislative changes.

Billiet, *Continued from Page 5*

Inspector Challenges

When Billiet isn't designing or installing, he dons his onsite inspector and property transfer/point-of-sale inspector hats for Sibley County. He's done some 4,000 inspections and occasionally acts as the county's liaison if homeowners need help.

One case occurred last year when floods caused a 100-foot-long section of an onsite system to slough off 2 feet down a ravine. The exposed septic tank was still in place with the pipes connected.

"Someone had installed the 12-year-old system into a bluff along a creek," says Billiet. "The design should never have been permitted because Sibley County has a 75-foot setback to bluffs that wasn't met." Local septic ordinances vary from county to county.

For Billiet, bearing bad news is often the most difficult part of being an inspector. He's had more than his share since MPCA adopted the 2008 septic code. "In the mid- to late-1990s and depending on the county, certain contractors were installing trench systems instead of mounds," says Billiet. "Mounds were the correct technology, but they cost $2,000 to $3,000 more."

The 2008 code required verifying the limiting layer at the site for the depth to the periodically saturated soil. The rule eliminated most cheating. Then point-of-sale inspections became law, and homeowners learned their 10- or 15-year-old systems were noncompliant. "These people have little legal recourse," says Billiet.

Besides witnessing the fallout of such failures, Billiet also has had to worry about his safety. Feuding neighbors occasionally file invalid complaints about the other's septic system. Sibley County then asks the homeowners if Billiet may visit the properties to verify the situation. Several years ago, five citizens filed such complaints, and the county needed search warrants for three of them.

Going Underground

Billiet faced another calculated risk after the 2008 economic downturn. The company, which took the hit later than most, confronted uncertain days. For two years, Billiet and Brenhaug did everything. Then Dan Crotteau, now working for Plumbing and Heating by Craig, made a proposal.

"Their geothermal heat pump installations were increasing, and they were contemplating buying directional boring equipment, backhoes and trucks," says Billiet.

"Since I owned everything except the machine, Dan guaranteed a certain amount of work if I purchased it. I didn't have a clue how to operate one."

Billiet bought a 2006 JT2020 machine and mixing tanks from Ditch Witch of Minnesota. "On our first job, the territory manager showed us how to run the machine and use the different additives," says Billiet. "From then on, it was trial and error."

Mid MN Geothermal Services opened in 2010. The company focuses on installing geothermal loops and exchange piping, and 2-inch pressure lines for subdivision drainfields.

Billiet, *Continued on Page 7*

Tank Fee Reminder... Deadline is Jan. 31, 2016

Remember these changes when submitting 2016 tank installation fees

By the MPCA

As reported previously, beginning in 2016 there will be a new method used for installers to submit their tank fees for tanks installed during the 2015 calendar year. This process change is a result of the update to Minn. Stat. 115.551 that was made during the 2014 legislative session. This new process includes the following steps:

1. Prior to the end of the 2015 calendar year in November, a reminder letter will be sent to all installers to work with their local governmental units (LGUs) to verify the number of tanks installed during the calendar year. This reminder letter will also contain the SSTS Tank Fee Record/ Submission Form that is required to be filled out and submitted to the MPCA.
2. All installers (even those who did not install any tanks during the year) will need to complete the SSTS Tank Fee Record/Submission Form and send it to the MPCA no later than Jan. 31, 2015. If you did not install any tanks in the calendar year you would report zero on the SSTS Tank Fee Record/Submission Form.
3. Installers will then receive an invoice in April. This invoice will need to be paid within 30 days of receipt to avoid enforcement. Payments for SSTS tank fees should always accompany an invoice.

The LGUs will still submit tank installation counts in their annual reports to the MPCA. The MPCA will use these reports to audit the number of tanks installed reported by installers. If discrepancies are found, the MPCA will contact the installer to follow up. Discrepancies could result in an enforcement action. If you have questions about the new method for submitting tank fees, contact Carol Decker.

Billiet, *Continued from Page 6*

"We will install electric, gas and waterlines for homeowners, but heavy competition makes vying for major utility or municipality contracts unrealistic," says Billiet.

Know The Geology

Billiet quickly learned that running the machine was half the equation. One job involved boring septic lines through a golf course. The contractor assured him the soil was clay. "We began drilling and hit sand and gravel," says Billiet. "Drill heads don't want to turn in that combination because it's too soft, too wet or so hard the drill head overheats." The bore took 40 percent longer than estimated.

Another project 60 miles from Hutchinson offered an opportunity to highlight the company. A local firm hired by an HVAC contractor to install geothermal piping had burst through the water and sewer lines of a million-dollar home.

"The contractor said the drilling was easy," says Billiet. "Just bore under the driveways, garages, landscaping and the basement floor to the other side of the house. Then he would cut a hole in the floor and make the connections."

Instead of clay, Billiet and his worker encountered rock. After advancing 300 feet over most of the day, they were forced to abandon the job 20 feet from the house or ruin the equipment. Since then, Billiet checks an area's geology before accepting large jobs or leaving town. He uses well drillers' public records, which show the location of gravel and bedrock.

While this year offers the promise of economic improvement, it also signals Billiet's transition to retirement. After selling the company, he plans to return as part-time manager until the new owner and Brenhaug earn the necessary licenses. Meanwhile, Billiet has signed another two-year contract with Sibley County and purchased a home in Arizona to escape the Minnesota winters.

This article first appeared in the September 2015 issue of Onsite Installer magazine, published by COLE Publishing Inc., www.onsiteinstaller.com. It is reprinted by permission.

Septic Systems in the Northern Lake Country

MPCA staffer bites bullet, pulls "trigger" on new septic system

By the MPCA

This past summer, the MPCA's Barb McCarthy, like many people who were planning to sell their home or lake place, needed to have her septic system inspected and given a clean bill of health before her house could change hands. This requirement is one of several "triggers" many Minnesota counties have adopted in order to identify and upgrade or replace septic systems that do not meet current standards.

But knowing what she does about the soils where she lives, "I didn't even bother with an inspection," says McCarthy who works in the MPCA Subsurface Sewage Treatment System (SSTS) program. "I knew my existing system wasn't going to meet standards because of where I live in St. Louis County (near Duluth). The soils here are not suitable for the type of system I had in place."

By "not suitable" she meant there are only a few inches of permeable soil above several feet of mostly impermeable clay, a fact that was reinforced earlier this summer when soil scientists from around the country met in Duluth for a national conference hosted by the National Resources Conservation Service (NRCS).

They visited McCarthy's property and a few other sites near Duluth to dig pits and analyze the resulting soil profiles. The soil pit on McCarthy's property revealed about six to eight inches of soil suitable for a septic system drainfield and several feet of basically impervious red clay.

Getting the right "profile"

For adequate treatment, wastewater needs to travel through at least 36 inches of suitable existing soil or other filter medium, such as sand, at just the right speed, not too fast or too slow. There also needs to be at least three feet of separation between where wastewater enters the treatment field and the seasonal high water table (the depth where the soil is saturated during the wettest part of the year) in order to avoid contaminating ground water. In McCarthy's case, the depth to groundwater was not an issue, but the composition of the soil certainly was.

Before designing a septic system for a homeowner, a septic professional must first dig a hole to analyze the soil conditions (soil profile and distance to seasonally saturated soils) and provide the homeowner with design options that would work at that particular site.

In some cases, the soil profile is such that a drainfield can be built rather simply by digging shallow trenches and applying a layer of clean gravel in which is embedded perforated piping through which effluent is distributed. This is known as an in-ground trench system. Oftentimes, however, existing conditions require building a sand mound to provide the proper soil profile and separation from groundwater needed to adequately treat septic waste and meet current standards. A mound system was definitely required at McCarthy's residence.

Building the mound

McCarthy worked with her septic system designer and installer to pick a suitable location for the mound system that would service the 2,100 square foot, three-bedroom home. Many trees had to be removed to make room for the mound. And because the existing suitable soil layer in her yard is only six inches deep at its thinnest, the mound needed 30 to 32 inches of washed sand. Sand containing silt and clay and other "fines" can clog the spaces between sand grains.

Placed on top of the sand is a rock bed that is 5 feet by 85 feet (see photo above). The rocks help to disperse effluent into the underlying sand bed. The rocks too must be cleaned of fine materials to prevent them from being washed down

New Septic System, *Continued on Page 10*

New Septic System, *Continued from Page 9*

into the sand where they can clog the system. Drainfield rock is larger than an inch and half across.

Perforated effluent distribution pipes are installed on top of the rock. The pipes are then then covered with additional rock to protect the pipes. The rock bed is covered by a special fabric material that allows air and water to pass through but prevents topsoil and sand from entering the rock bed. The filter fabric is then covered with loam and sandy loam and then topsoil so grass will grow on the mound.

Liquid and solid waste generated by sinks, bathtubs, showers and toilets runs from the house via a pipe known as a "building sewer" to a combination septic tank/pump tank (above). McCarthy's septic tank is 1,000 gallons which then flows into a 500 gallon pump tank or dose tank.

McCarthy's system is designed to treat 300 gallons of wastewater each day to the mound via a supply pipe (pictured Page 11). Wastewater is pumped to the mound throughout the day through a series of four "doses" of about 70 gallons each when the float is activated and the pump turns on. This allows time between doses for the wastewater to effectively move through the mound sand and into the underlying soil.

"It works like the sump pump in your house," McCarthy says. "It will draw down to a certain level in the tank and then shut off until the pump tank fills back to that level and another dose is sent to the mound."

The wastewater is sent to the mound under pressure that has been calculated to ensure wastewater will fill the entire length of the perforated piping located within the mound and be dispersed along the entire length of the mound and not just one portion where it could pool up. When the pump shuts off, water remaining in the supply pipe drains back into the pump tank, preventing water in the pipe from freezing during the winter.

Insulation important for new septic systems

When completed, McCarthy's mound measured 125 feet long and 40 feet wide at a total cost of more than $15,000.

"When you average the cost of the system over its expected lifetime of 30 years or more you come up with a number that is not that different than what those who live in urban areas pay for their wastewater treatment," McCarthy says.

The big difference with the cost for a rural septic system is the investment is made up front, which can pose a challenge for some homeowners if they are not recouping some or all of that cost during a property transfer.

The mound's large dimensions are needed on this site to ensure that the effluent is able to move through it at the proper rate and in a way that does not allow the effluent to surface at the 'toe' or downslope berm of the mound to keep the sewage below the surface.

McCarthy's mound was completed in late summer, in time to get a good cover of grass started. Grass and other cover plants are important as they help provide insulation that will help prevent freezing problems, especially during the first winter following system construction. She plans to add straw this November to ensure there won't be any problems. She also hopes there will be snow cover this year which provides additional insulation.

Wieser Concrete's Birch Point Wastewater Treatment Install in Saginaw is Case Study in Cooperation

Tom Rovinsky, project manager of Lakehead Trucking, was ready to go!

Tom and his crew had all nine tank holes for the treatment system dug and the site ready when the Wieser Concrete crew showed up at 9:00 am.at the Birch Point Wastewater Treatment in Saginaw, MN.

The system, designed by MSA-Professional Services, consisted of a 12,000 equalization tank, 9100 gallon Bio-Microbics tank, five 5,000 Gallon Bio-Microbics tanks, one 2,500 dosing tank and one 5,000 gallon drain field dosing tank. We worked closely with Petersen Supply to have the Bio-Microbic units preinstalled in the tanks to save installation time on site. All the tanks were placed by 5:00 pm that same day. This consisted of seven semi loads of tanks traveling over 220 miles.

The second phase of the project will be the collection system. This will consist of installing 32 2000 gallon two compartment tanks. One at each home on this system. The tanks at each home will do the initial treatment of the waste before being dosed to the main treatment system. This was a perfect solution to treat the waste without requiring 32 individual drainfields. At the same time this project saved valuable lakefront property.

Onsite Industry & Carbon Footprint, *Continued from Page 1*

development for both government entities and end users.

In addition, the environmental impacts of both a precast concrete septic tank and gravel/pipe drainfield (conventional) onsite systems and systems using recycled thermoplastics were evaluated. Water consumption, electricity consumption, fuel consumption, and carbon emissions were evaluated through raw material production, product manufacturing and transportation for both systems. It was determined that when transporting a recycled thermoplastic system 1,030 miles and a conventional system only 30 miles, the recycled system reduced electricity consumption by 88% (7,418 kWh saved), fuel consumption by 67% (4,480 kBtu saved), water consumption by 97% (1,010 gal saved), and carbon emissions by 44% (220 kg C saved).

Our everyday choices as members of the decentralized wastewater industry have an impact on the environment around us. What if we, as an industry, stood up through our local representatives and legislators to push for more funding of decentralized systems? What if we made daily choices that expressed our concern of the environment and chose to operate sustainably? We, as an industry, have the opportunity to lead—to build a sustainable and inspiring industry that gathers young, eager minds, ready to change the world. Let's grasp the opportunity. Let's start with *Why*.

Starting out with Why?

Why do you do what you do? In his book, *Start with Why: How Great Leaders Inspire Everyone to Take Action*, Simon Sinek discusses the importance of not only knowing what you do and how you do it, but why you do it. Sinek discusses in his book that every single organization on the planet, even our own career, always functions on three levels. What we do, how we do it and why we do it. When these pieces are aligned, it gives us a filter through which to make decisions; it provides a foundation for innovation. When all three pieces are in balance, others will say, with absolute clarity and certainty, "We know who you are," and, "We know what you stand for."

He goes on to state that every person, company, or organization knows what they do. These are the products we sell or the services we provide. For our industry, it might be installing septic systems, pumping tanks, designing systems, writing regulations, inspecting systems, or even manufacturing septic products.

Some companies and organizations know how they do what they do. These are the things that set us apart from our competition; the things we think make us special or different from everyone else. Maybe it's how quickly you can get a system in, or the latest equipment that you use; maybe your regulations are more stringent or up-to-date than your neighboring provinces, or perhaps you're known for manufacturing the highest quality septic product.

But very few people and organizations can clearly articulate why they do what they do. Why is a purpose, a cause or a belief. It provides a clear answer to why we get out of bed in the morning, why our company or organization even exists and why that should matter to anyone else. To be clear, making money is not and cannot be a why. Revenues, profits, salaries, and other monetary measurements are simply results of what we do. The why inspires.

Sinek says that we naturally communicate from the clearest thing to the fuzziest thing. We tell people what we do, we tell them how we're different or special and then we expect a behavior like a purchase, a vote or support. But the problem is that what and how do not inspire action. Facts and figures make rational sense, but we don't make decisions purely based on facts and figures, do we? How many times have we made a decision because it "feels right", regardless of what the facts show?

Leaders and organizations with the capacity to inspire, think, act, and communicate starting with why. When we communicate our purpose or cause first, we communicate in a way that drives decision-making and behavior: a vote, a purchase, a promotion, or awarding a bid (Sinek, 2011).

So why do you do what you do? I joined the wastewater industry to interact directly with society and protect public health. I joined the decentralized wastewater industry because it is the most environmentally-sound, passive form of wastewater treatment and recycling. But what is truly saved by using decentralized wastewater treatment? And what can we do as an industry to help negate the environmental and financial problems that are arising and protect the environment around us?

Centrailzed vs. Decentralized Wastewater Management Study

Introduction

The environmental benefits of operating decentralized over centralized wastewater management have long been cited. Decentralized management is most often passive, allowing for groundwater recharge with little to no operational energy consumption. Decentralized systems require little maintenance and, with proper care and design, perform equally to centralized treatment processes (Kautz, 2015a).

While there are areas where decentralized wastewater treatment is not a viable option due to lot size or geologic conditions, the first reaction to sewage problems is usually to connect the area to an existing WWTP through centralized sewer line extensions. However, before reaching this conclusion, the environmental, economic, and cost impacts of each project should be more clearly assessed to ensure it is the best solution (Kautz, 2015a).

Onsite Industry & Carbon Footprint, *Continued on Page 13*

Onsite Industry & Carbon Footprint, *Continued from Page 12*

Overview

An analysis was performed to quantitatively determine the environmental and fiscal costs associated with the materials and construction of 40 sewer extension projects in Southwest Virginia. Environmental costs were defined as the embodied carbon and embodied energy of manufacturing and installing the materials (total primary energy consumed or carbon released over a material's life cycle).

The sewer extension projects were identified and individually defined through the Southwest Virginia Regional Wastewater Study; each project was delineated within the report by a breakdown of material and construction costs. The breakdown of materials was used to determine the environmental costs of the materials in the project. The construction equipment used to install the materials associated with each project and the related fuel efficiencies and production rates were estimated through literature review.

Results

The average per connection resource savings are shown in Table 1 and Figure 1. As shown, there's a 75% savings in embodied energy, 73% savings in embodied carbon, and 68% cost savings on average through the construction of decentralized wastewater systems over the centralized sewer extensions.

The savings associated with each decentralized system is significant; the energy savings of 117,538 MJ is equivalent to the energy content of 969 gallons of gasoline – enough to take 2,093 cars off the roads for a day, the carbon savings (5,099 kg CO2) is equivalent to the savings associated with 133 CFL light bulbs, and the monetary savings ($12,636) would allow 3 decentralized systems to be put into the ground for the same price as hooking one home up to the sewer extension (Kautz, 2015a).

So again, why do we do what we do? We work in this industry because decentralized wastewater management is passive with little operational cost, provides equal or better treatment, can be adapted to both large and small flow situations, and provides resource savings that greatly aid government efforts in environmental preservation and budgeting. But what about our day-to-day decisions in this industry? How do our day-to-day choices impact the environment, and what can we do better as the decentralized industry?

Table 1. Comparison of average per connection resource consumption for centralized and decentralized wastewater management.

	Centralized Per Connection	Decentralized Per Connection	Difference	Percent Difference
Embodied Energy (MJ)	157,563	40,025	117,538	75%
Embodied Carbon (kg CO2)	7,006	1,908	5,099	73%
Cost (USD)	$18,590	$5,954	$12,636	68%

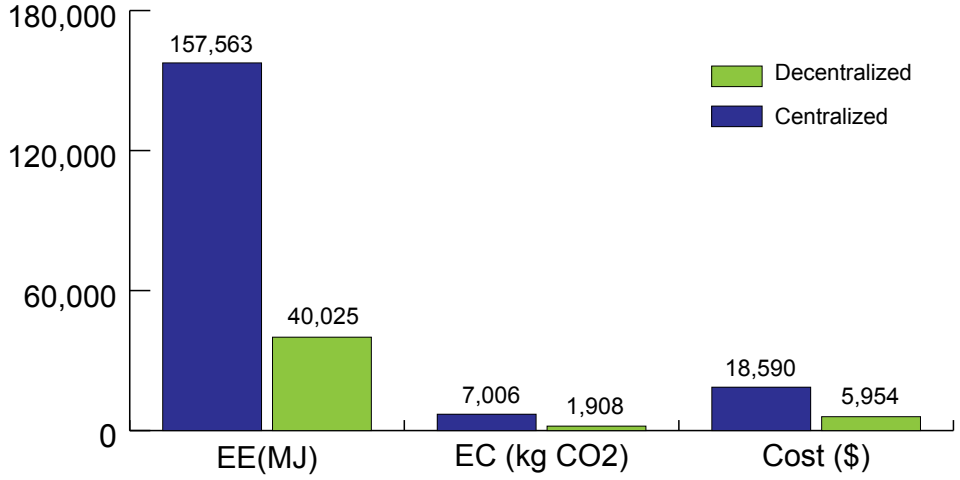


Figure 1. Comparison of Average per Connection Resource Consumption for Centralized and Decentralized Wastewater Management

These values were then used to determine the average resource consumption per connection to the sewer extension and compare it to the average resource consumption of a typical decentralized wastewater treatment system (connecting one home to a sewer extension vs. an average decentralized system). A 3-bedroom septic system (concrete septic tank and gravel and pipe drain field) was used as the model for the decentralized systems, as it is the most common form of decentralized wastewater treatment in the US (Kautz, 2015a).

Conventional vs. Recycled Plastic System Study

Introduction

When decentralized wastewater system installers,distributors, and regulators are asked how they make daily operational choices, we often hear the phrase, "This is how we have always done it." This phrase is often used to remain complacent and comfortable in the way we operate businesses and organizations. It is easy to be comfortable with how things are done – change often requires hard work and persistence.

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Onsite Industry & Carbon Footprint, *Continued from Page 13*

But what if other industries did the same thing? Three industries—clothes washing, cell phone, and automobile industries— have refused to remain complacent and instead have chosen to move forward as an industry to provide society with the best possible solution for their needs. What if we still had to wash clothes using a washboard or manual device? What if the cell phone industry remained complacent and mobile phones didn't evolve? The same can be said for the automobile industry. But, thankfully, these industries made the decision to move forward – not to say, "This is how we have always done it," but to say, "How can we do it better."

Onsite wastewater treatment systems have historically been composed of concrete septic tanks and stone/pipe drain fields. However, the processes and materials used to manufacture conventional systems consume a large amount of resources (aggregate, water, fuel, electricity) and emit a large amount of CO2. Alternatively, other materials have been increasingly substituted for conventional materials, including recycled thermoplastic septic tanks and chambers. These materials have qualitatively been considered more environmentally friendly, but no quantitative comparison has been evaluated in regards to resource consumption and carbon emissions (Kautz, 2015b).

Overview

An analysis was performed to quantitatively determine the resource usage and carbon emitted in the manufacture and transport of both a conventional septic system and a system utilizing recycled thermoplastic products. The conventional system was defined as a 1,000-gallon, precast concrete septic tank and a 1,000-sf stone drain field using 4-inch PVC piping for distribution[1]. The recycled thermoplastic system was defined as Infiltrator Water Technologies' (Infiltrator's) IM-1060 septic tank and a 1,000-sf drain field of Quick 4 Standard chambers. The analysis included raw material processing, manufacture of the finished product, and transportation of the product to the field site. Resources compared were water, electricity, and fuel. The installation of each system was not included in this study (Kautz, 2015b).

For the conventional system, the transportation distance was assumed to be 30 miles to account for availability of local materials; for each conventional system, one truck carrying one tank and one truck carrying the amount of stone required for the drain field each travelled 30 miles to deliver

1 The calculations presented in Kautz, 2015b use 3-inch PVC piping rather than 4-inch. After multiple suggestions, this part of the study has been updated to use 4-inch PVC in conventional drain fields.

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Table 2 – 1000-mile vs 30-mile transportation distance comparison – no drainfield area reduction

	Conventional	Recycled Thermoplastic	Percent Reduction	Units
Distance to Site	30	1,030	-	mi
Electricity Consumption	8,383	965	88%	kWh
Fuel Consumption	6,674	2,194	67%	KBtu
Water Consumption	1,043	33	97%	gal

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the conventional system to the work site. Material properties and coefficients for emissions, water, fuel, and electricity consumption were found through literature review. The majority of conventional system consumption coefficients were sourced directly from the concrete industry (Kautz, 2015b).

In calculating resource consumption of the recycled thermoplastics system, a flatbed transportation distance of 1000 miles was used to represent shipping from the manufacturing plant to distributors in flatbed shipping densities. A distance of 30 miles was then used to calculate the distance traveled from distributor to the installation site in two pickup trucks total, one transporting the tank and one transporting the chambers. The recycled thermoplastics system analysis was calculated using a drain field sized 1:1 with a conventional system; while sizing reductions are common throughout US regulations, the 1:1 drain field sizing gives a more direct correlation between the two systems. Resource consumption, carbon emissions, and number of products produced were monitored over six months of production at the Infiltrator Winchester, KY manufacturing plant. This data was used to determine the resource consumption and carbon emission coefficients.

Results

The recycled thermoplastic system consumes significantly less resources and emits less carbon than the conventional system. When comparing the transportation distances of 1,030 miles for the recycled plastic system and 30 miles for the conventional system, the combined manufacture and transportation of the thermoplastic system still consumes 88% less electricity, 67% less fuel, 97% less water, and emits 44% less carbon than the conventional system [Table 2, Page 15, and Figure 3 - Page 16] (Kautz, 2015b).

The savings associated with each decentralized system is significant; the electricity savings (7,418 kWh) is equivalent to the average daily residential electricity usage of 250 people, the fuel savings (4,480 kBtu) is equivalent to the average daily fuel use of 33 people, the water savings (1,010 gal) is equivalent to the average daily supply for 13 people, and the carbon savings (220 kg C) is equivalent to the amount of carbon sequestered by a tree over its entire lifespan (U.S. EIA, 2015; U.S. EIA, 2014; U.S. EPA, 2015; U.S. Census Bureau, 2014; Eco Preservation Society, 2008).

Conclusions

So why do you do what you do on a daily basis? Do the decisions you make on a daily basis align with your Why? Or do you base your decisions on your What's and Hows?

Decentralized wastewater management provides both environmental and economic benefits for new communities and those looking to update their current wastewater management systems. They are often passive systems, requiring little to no operational costs, and can provide similar treatment levels to centralized systems when properly designed, sited, and maintained. The materials and construction associated with decentralized wastewater managements consume far less embodied energy, embodied carbon, and capital than centralized systems. The average resource savings per connection was calculated to be 75% in embodied energy,

Onsite Industry & Carbon Footprint, *Continued on Page 16*

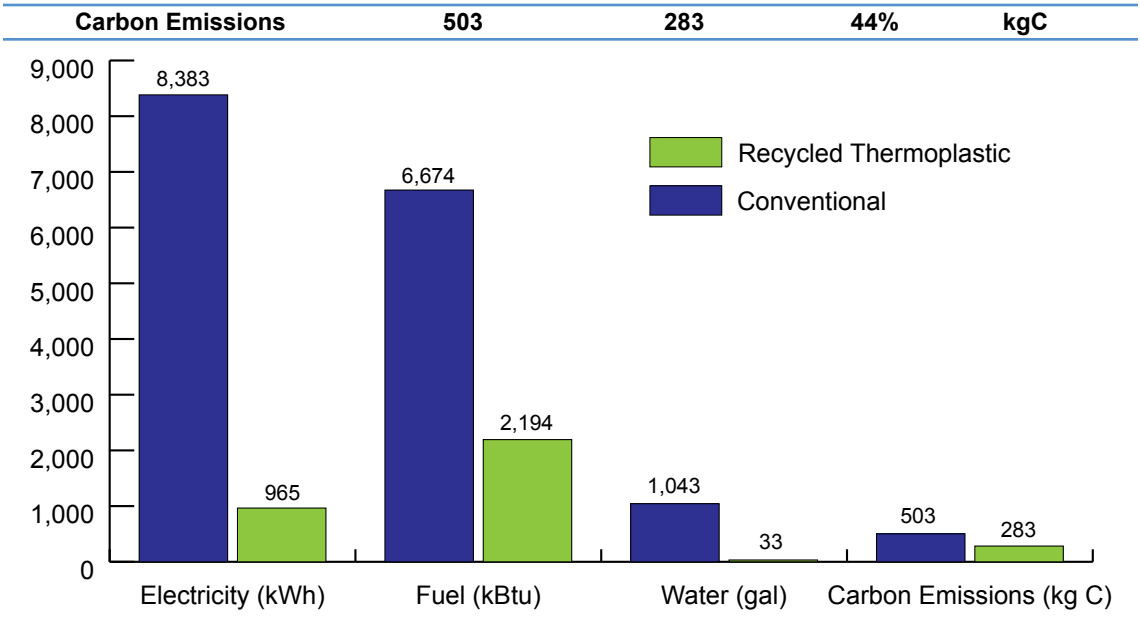

Figure 3. Comparison of Resource Consumption for Conventional and Recycled Thermoplastic Septic Systems

Onsite Industry & Carbon Footprint, *Continued from Page 15*

73% in embodied carbon, and 68% in capital. These savings have the potential to add up quickly with the large number of sewer extensions and new developments being installed each year (Kautz, 2015a).

In addition, the results from the conventional vs. recycled thermoplastic system analysis showed systems using recycled thermoplastic consume fewer resources and emit less carbon into the atmosphere. When comparing the transportation distances of 1,030 miles for the recycled plastic system and 30 miles for the conventional system, the thermoplastic system still consumes 88% less electricity, 67% less fuel, 97% less water, and emits 44% less carbon than the conventional system. It can therefore be concluded that the use of recycled thermoplastic septic system products over conventional products is a more sustainable approach to onsite wastewater treatment (Kautz, 2015b).

Onsite Industry & Carbon Footprint, *Continued on Page 17*

Onsite Industry & Carbon Footprint, *Continued from Page 16*

The onsite wastewater industry is at a pivotal moment in our history. Regulations are becoming more stringent; higher expectations are continuously placed on the industry as a whole to lessen the pollution load placed on surface and ground waters. At the same time, legislation is being pushed nation-wide to move more toward a centralized approach for wastewater treatment. What if we, as an industry, stood up through our local representatives and legislators to push for more funding of decentralized systems instead of standing by idly watching it unfold?

What if we made daily choices that expressed our concern of the environment and chose to operate sustainably? Our industry could be a leader of recycling and reducing natural resource consumption, to preserve the environment that is quickly fading around us while reducing the amount of waste in landfills worldwide.

What if we decided to make these changes together instead of settling for how it has always been done? Our industry has the opportunity to lead and inspire – to build a sustainable and inspiring industry that gathers young, eager minds, ready to change the world. This can only be done by leading with Why – this must be the future of our industry.

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2015 OSTP Certification Course - Descriptions and Offerings

University of Minnesota
ONSITE SEWAGE TREATMENT PROGRAM

Installing Onsite Systems (12 Direct Credits)
Fee: $260 - Exam: Yes
This 12-hour workshop prepares attendees for the Installer exam and provides information about proper installation practices.

PREREQUISITE: Introduction to Onsite Systems

Topics include:
- Construction planning
- Construction practices
- Tools for installing
- Pipelayer certification

112-3 Alexandria - Douglas Cty Public Works Building 12/3-4/15 Deadline: 11/26/15

Installer Continuing Education (12 Direct Credits)
Fee: $260 Exam: No
This 12-hour workshop will meet the continuing education requirements for any registration but is specifically tailored for Installers. All information will be provided from the perspective of a system installer.

Topics Include:
- Construction safety
- Pumps and dosing
- Keys to proper installation
- Rule change implications

69-3 St. Cloud - Moose Lodge 12/17-18/15 Deadline: 12/10/15

General Continuing Education (12 Direct Credits)
Fee: $260 Exam: No
This 12-hour workshop is designed to meet the continuing education requirement for SSTS professional registration. The topics will be varied to give a wide range of information for SSTS professionals.

Topics include:
- Rule change implications
- Working on difficult sites
- Pressure distribution
- MPCA update

60-4 New Ulm- Holiday Inn 12/15-16/15 Deadline: 12/8/15

Pipelayer Certification (2 Direct Credits, 1 Related Credit)
Course begins at 1:00PM
Fee: $100 or $50 as add-on to enrollment in Installer CE
Exam: Yes
This 3-hour workshop is once again offered this year to accommodate a change in the Minnesota Plumbing Code that requires all septic system installers be either certified pipelayers, licensed plumbers, or registered apprentices in order to install sewer or water service pipes outside of a building in Minnesota.

Topics include:
- MN Plumbing Code
- Pipelaying
- Code compliance bond packet instruction

92-3 St. Cloud - Moose Lodge 12/18/15 Deadline: 12/1/15

Enroll online at: septic.umn.edu
Classes are filled on a first-come, first-served basis.
OSTP, 173 McNeal Hall, 1985 Buford Ave., St Paul, MN 55108
Fax: 612-624-6434 **Phone: 800-322-8642**

Comment period to MPCA begins soon for Chapter 7081 rule change on campground septic flow rates

Legislation was passed this past session that affects how campgrounds and resorts calculate septic flow rates for determining whether or not they need a State Disposal System (SDS) permit. Currently, the higher of estimated or measured flow must be used. The new law requires the MPCA to adopt rules, using the expedited rulemaking process, to eliminate the need for existing campgrounds and resorts that are open for 180 days or less per year to estimate wastewater flow rates. Instead, they will use monitored flow rates. The law contains specifics on the acceptable means of flow measurement and the frequency, time period and duration of measurements.

The change is contained in Chapter 4, Article 4, Section 144 of the first special session of the 2015 Legislative session. To more easily find Section 144 in this lengthy law, once you have navigated to the “2015 Minnesota Session Laws, Chapter 4” document on the Web, search for the word “campground” using the “Find” function under the “Edit” menu in top left hand corner of your browser.

The notice of intent to adopt this rule change will be published in early November in the State Register. A 30-day comment period will begin on the date of publication in the State Register.

2015 MOWA MEMBERSHIP APPLICATION

MOWA minnesota onsite wastewater association

Membership: ❑ **Renewal** ❑ **New Member**

❑ Individual Member $240 (1 person)
❑ Business Group /Government Unit $340 (up to 5 people; $100 /person after 5)
❑ Student $140 (1 person)
❑ Life-time ❑ Honorary

Note: Your MOWA Membership includes one NOWRA membership

Memberships are based on calendar year - After July 1st, new members pay $140-individual / $190-business or gov't groups for remainder of 2015

Individual/Group Contact: **This person will be listed as the NOWRA member on the Septic Locator website. They will be listed first in all MOWA publications. Please print clearly.**

• **1st Member** _____ **Company Name** _____

Address _____ City/State/Zip _____

Title _____ Phone _____ Mobile/800# _____ Fax _____

Email _____ Website _____ County _____

Circle the counties you work in: *Needed for Directory and Website.*

Statewide 88

Aitkin....1
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Becker....3
Beltrami....4
Benton....5
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Blue Earth....7
Brown....8
Carlton....9
Carver....10
Cass....11
Chippewa....12
Chisago....13
Clay....14
Clearwater....15
Cook....16
Cottonwood....17
Crow Wing....18
Dakota....19
Dodge....20
Douglas....21
Faribault....22
Fillmore....23
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Goodhue....25
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Hennepin....27
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Isanti....30
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Kittson....35
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Lac qui Parle Lake....37
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Le Sueur....40
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(Please list additional business/government group members on separate sheet with complete contact information.)

Publications: Would you prefer receiving 'Little Digger' newsletters via ... ❑ Regular Mail ❑ Electronically

We currently send one publication per address to business/government groups. Contact the MOWA office if you'd like additional copies.

Additional NOWRA Memberships: **MOWA membership fees include one NOWRA membership per company/organization. List names of members who want additional NOWRA memberships here: Cost - $40 per person.**

2)_____ 3)_____ 4)_____ 5)_____

Payment: *(Please print)*

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