Clean Water, Clean Soil: City of Ramsey Septic System Engagement Plan

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Resilient Communities Project
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Building community-university partnerships for sustainability

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The contents of this report represent the views of the authors, and do not necessarily reflect those of RCP, CURA, the Regents of the University of Minnesota, or the City of Ramsey.

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City of Ramsey

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Executive Summary:

The goal of this report is to provide the City of Ramsey with recommendations on how to perform outreach and engagement with its residents to increase maintenance of their septic systems. Septic system leaks are one of the main water quality issues in rural areas. The City of Ramsey has roughly 4,000 private septic systems, and a majority of its residents receive their drinking water from private wells. In the report, we first analyze and evaluate the current outreach and engagement strategies Ramsey is employing to gain a better understanding of what is and is not working. We then performed extensive research on successful septic outreach and engagement plans and tools across the nation. We recommend that Ramsey pursue a number of strategies to make their outreach and engagement effective including: developing and maintaining a database, improving their website, updating their septic ordinance, promoting Septic Smart Week, and incentivizing pumpers to submit required documentation. We also have provided Ramsey with deliverables to enable their outreach and engagement efforts including: an informative brochure, a press release, key talking points, and a poster for use to outreach events. It is by implementing these changes and/or practices that will allow Ramsey to frame septic system care in an engaging manner, creating a culture of engagement that increases septic system awareness, understanding, and maintenance.

Introduction:

Situation Statement

The City of Ramsey is located in Anoka County, Minnesota, and has roughly 4,000 private septic systems. Due to their age, many are approaching the end of their lifespan, raising concerns over groundwater quality as the City and its residents receive water from both public and private wells.

Introduction to Septic

A septic system is an underground wastewater treatment structure that is typically found in rural to semi-rural areas (EPA, 2016). It employs nature and technology to treat wastewater (like water and solids from flushing toilets, the kitchen, and laundry) from households. Septic systems are composed of three main components: a tank, a drainfield, and a soil absorption field. The tank, a watertight box typically made out of concrete, or fiberglass, is where the wastewater first

flows (EPA, 2016). It digests the organic matter and separates solids and floatables matter (ex. oil/grease). The effluent water is then released into the drainfield. The drainfield is a shallow, covered, hole made in unsaturated soil (EPA, 2016). The wastewater percolates through the drainfield, and is filtered by natural processes. It then flows into the soil absorption field, where it is absorbed, and follows gravity to join groundwater supplies (EPA, 2016).

Research Questions:

1. How is septic maintenance information communicated to residents?
    a. What records regarding septic-tank owners are maintained and how can that information be used?
    b. To what extent does Ramsey communicate septic maintenance information to its residents?
    c. What method is used to communicate septic information to residents?
2. How can Ramsey create a "culture of engagement" as it pertains to septic maintenance?
    a. To what extent do Ramsey residents act on the information they receive?
    b. What would it take to achieve higher rates of resident compliance?
    c. How have other cities engaged the public in active septic system maintenance?
    d. What issues did other cities encounter while engaging the public and how did they overcome them?
    e. What incentives for maintenance or financial support could Ramsey offer?
3. How can septic maintenance information be framed in a positive/engaging manner?
    a. How can Ramsey provide knowledge and engage parties who are not interested?
    b. How can the information be presented in such a way that proper septic maintenance is perceived as the obvious best choice?
    c. How can focusing on a specific aspect of maintenance (i.e. microorganisms) increase public interest and engagement?

Goal:

The goal of this report is to provide the City of Ramsey with an effective participation and engagement plan to increase its residents' maintenance and replacement of septic tanks to protect water quality and natural resources.

Current Practices:

Currently the City of Ramsey communicates septic information to its residents through a brochure, the city website, and social media accounts. The brochure regarding care and

maintenance is available at the city office, the website offers septic maintenance information, and social media accounts help promote care through promotions like Septic Week. Although Ramsey has attempted to provide homeowners with septic information, a lack of maintenance to systems still remains. This lack of maintenance may be caused by a lack of up-to-date information on septic systems or the difficulty found in obtaining pertinent septic information, specifically in regards to policies, forms, and documents. Although the City of Ramsey holds records of homeowners with septic systems, the database is not complete and does not contain accurate, up to date information on many homeowners systems. This lack of information may lead to a difficulty in enforcement and regulation from the city. Additionally, a lack of brochure accessibility, a lack of an intuitive website with easily accessed policies and forms, and a lack of engagement on social media accounts may be a deterrent to information ascertain.

In order to cultivate a culture of engagement as it pertains to septic maintenance, Ramsey should seek to:

- Update their septic database
- Enhance their website with relevant septic policies and forms
- Improve brochure-type handouts and their accessibility
- Revitalize Septic Week procedures
- Implement ordinance improvements

Additionally, targeting these new measures at stakeholders will aid in increased compliance and septic care, as more accessible information, policies, and forms, will improve proper septic care practices. Historically, homeowners do not act on information as it can be hard to find, and policies may not be well understood. By improving homeowners understanding of what is required of them, residents will be more likely to comply with ordinances. Additionally, clearly explicating the costs of poor septic management as it relates to homeowner, social, and environmental health will help encourage homeowners to take action. By making septic systems personally relevant, Ramsey can help homeowners understand the importance of septic care, and with an increased ease of septic care policies and forms, homeowners will be more likely to maintain their systems.

Target Audiences/Stakeholders:

1. City of Ramsey Public Works
2. Septic tank businesses
3. Septic tank owners

4. Residents with private drinking wells

Incentives for Stakeholder Involvement:

When determining the septic system stakeholders in Ramsey, it was concluded that the four major stakeholders are the City of Ramsey Public Works Department, the septic maintenance/pumping businesses, septic tank owners, and residents with private drinking wells. These stakeholders were determined to be have the greatest incentives for involvement as these groups are affected by system failure and have the greatest impact on the care and maintenance of septic systems.

The City of Ramsey Public Works was determined to be a stakeholder as they are responsible for knowing how many systems are in place throughout the city and how often they have been maintained. A current lack of knowledge on tank locations and maintenance however has left the city unable to properly manage and regulate. Similarly a lack of accountability or enforcement policies may hinder the city's authority in holding residents responsible for caring for their septic systems. By improving the city's knowledge on septic systems locations and updating databases dates of last maintenance for each system the city will be better able to hold residents more accountable for their septic system care. The greatest incentive for involvement is the resulting improved septic care, but will help prevent groundwater contamination from failed systems throughout the city.

Septic tank businesses were also determined to be stakeholders, as they are responsible for the pumping and maintenance of septic systems, as well as the documentation of maintenance given to the City. Increased regular business is the greatest incentive for businesses involvement in improved septic maintenance. However a lack of ease in reporting policies or strict requirements may deter businesses from properly documenting.

Septic tank owners are also primary stakeholders, as proper routine septic system care and maintenance reduces overall cost of the system, saves the owner from high replacement costs, and protects their groundwater. A lack of proper septic system care and maintenance may be a result of an out of sight out of mind mentality, a lack of information regarding maintenance requirements or timing of last maintenance, or high maintenance or replacement costs.

Residents in the community who have private drinking wells are also a major stakeholder, as leaking septic tanks in their community may have an affect on their drinking water. If tanks in

their neighborhood are leaking or have failed, there is the potential for surrounding groundwater to be contaminated. Not only is contaminated water a health concern, but also may be a costly contamination to remedy. Although residents with wells have a stake in the well-being of septic systems, a lack of knowledge regarding where septic systems are, how they work, or how failed systems affect them may hinder their participation in improving septic care awareness.

Methods and Results:

Literature Review

For gaining an understanding about basic functions of residential septic systems and how to decrease maintenance needs and costs while extending lifetime, we turned to basic web searches with ample information available. The many web pages of septic functioning and maintenance fell primarily into categories of governments entities, septic service providers, and homeowner education websites. There was a high degree of information redundancy amongst these sources demonstrating that septic best practices are well established.

City Comparisons

In order to gain insight into how other municipalities operate and manage septic systems we researched septic related fees, ordinances, outreach strategies, and websites of several cities and counties in Minnesota. Many of the cities and counties operated in similar ways, with some key differences relating to outreach strategies, fee amounts, and whether the homeowner or certified pumper is required to submit associated permits and fees.

i. Columbus

The city of Columbus requires septic pumping permits to pump a septic tank. The licensed septic pumper obtains the permit. The price of a pumping permit for a private septic system is $10.00. Columbus also requires septic installation permits to install or repair septic systems. A septic system design must be designed by a Minnesota certified septic system designer and submitted to the city by a licensed septic installer. After the septic system design has been approved and the permit fee is paid, a permit is issued to the licensed installer. The permit fee for a tank/drainfield is $300, and for a holding tank/septic system only, the fee is $50.00.

In Columbus homeowners are required to submit forms every three years certifying that inspection, maintenance, and pumping of their septic system has been completed. In order to aid homeowners, the city of Columbus website also provides information on where to find certified septic companies who can complete point of sale septic compliance inspections, pump/maintain septic systems, or conduct a soil boring. If a homeowner fails to submit a triennial report, the Zoning Administrator will direct the Building Inspector or other qualified individual to inspect the owner's system on their behalf (2030 Comprehensive Plan, Columbus, 2009). In this case, homeowners are required to pay for the city's inspection within 30 days.

The website also provides information on the AgBMP loan program. The AgBMP Loan Program is funded by the Minnesota State Legislature, the Minnesota Public Facilities Authority, and the U.S. Environmental Protection Agency and is administered through the Minnesota Department of Agriculture. The AgBMP loan program provides loans for projects that improve water quality problems caused by nonpoint source pollution. The program provides funding for local implementation of clean water practices at a very low cost. It is unique in its structure and is not duplicated by other programs or funding sources. This loan is available to residents of Ramsey, or other localities (Buildings and Inspections, 2017).

ii. North Oaks

In North Oaks, city ordinance requires all septic systems to be pumped every two years. Reminder postcards are mailed to homeowners a month before their pumping is due. Maintenance reports, on forms approved by the city, are required to be submitted to the City within 30 days of servicing the system. A filing fee is required to be paid upon filing of the reports.

On the city of North Oaks' septic system webpage, a septic tank maintenance report form is provided. The homeowner is required to submit this form, along with a $17.00 payment every two years, or after any maintenance or inspection. North Oaks septic system web page also provides tips on how to keep a septic system properly operating to prevent failure and negative health impacts. In addition, the city provides a list of approved Septic System pumpers located in or near North Oaks (Building & Inspections FAQs, 2017).

iii. Lino Lakes

Homeowners in Lino Lakes that that have an on-site sewage system on their property are required to have their septic system inspected and/or pumped on a regular basis. Inspections are required every three years and must be performed by a licensed ISTS maintainer/provider. Contractors must purchase the pumping/inspection permit form and submit it after the pumping or inspection has been completed. City ordinances regarding septic systems were not available on the city's website (Septic Systems, 2017).

iv. St. Louis County

Saint Louis County has recently enacted a new ordinance which "removes provisions better addressed in the County's zoning ordinances, broadens the use of holding tanks, modifies point of sale program requirements, and incorporates local system design considerations (Subsurface Sewage Treatment System Ordinance, 2017)." In developing the new ordinance, county staff spent considerable time working with state-licensed septic designers, inspectors, installers and maintainers, and other interested parties to update the ordinance to reflect changes in state law while incorporating local considerations.

v. Blaine

Homeowners in Blaine must obtain a permit from the city to alter the location, construction, extension, conversion, modification of a septic system. Permit applications for new and replacement SSTS must include a management that includes a schedule for septic tank maintenance. According the fee schedule, installation or alteration of a septic system is $320.00. It is unclear if there any fees for pumping or inspection of septic systems. It is also unclear whether the septic pumper or the homeowner must submit the pumping/inspection form. If the property owner fails to pump or maintain the subsurface sewage treatment system in accordance with Minnesota Administrative Rule Chapters 7080.2450, after notification by the department, the city may order the required pumping and/or maintenance and the owner will be responsible for the costs plus a $100.00 administration fee (Septic Information, 2017).

vi. St. Paul

In St. Paul, a completed septic packet filled out by a Minnesota Pollution Control Agency certified maintainer and/or inspector with a $20 fee and a completed well water analysis report from a Minnesota Department of Health certified laboratory with a $10 fee must be

sent to the city. Pumping and inspections must be completed and reported to city at least every two years (Septic Systems, 2017).

Website Reviews

In order to understand what information was typically offered to residents regarding septic systems and maintenance, septic system web pages from Ramsey and 7 different communities were reviewed. All websites were from cities and counties across Minnesota; Columbus, North Oaks, Lino Lakes, St. Louis County, Blaine, St. Paul, Olmsted County. Our goal was to see what educational information, weblinks, licensed pumpers, codes or ordinances, and permits or forms cities or counties throughout the state provided residents.

As seen in Table 1, all pages contained relevant permits or forms except the City of Ramsey, and all except for North Oaks and Columbus has information from, or links to, the MPCA septic pages. Additionally all web pages except for Columbus had homeowner guides, tips, or educational information regarding septic care. Included with homeowner information was also licensed pumpers, excluding Blaine and North Oaks. Codes/ordinances for each city were also listed on each septic page except for on Blaine's and Lino Lakes' page.

Although the City of Ramsey did contain similar information to other websites, some of Ramsey's information was insufficient, signified by the asterisks. The City of Ramsey did not contain policies, permits, or forms for residents, unlike the research cities. Additionally, although website links to additional septic information were present, some links were broken or had been changed. The City of Ramsey website also lacked relevant building codes, and although had a link to the Rules Chapter, the link once accessed was hard to understand or maneuver.

Table 1: The Information Present on each City or County Septic System Web Page

City or County	Permits/ Forms	Web Links	Edu. Info	Licensed Pumpers	Codes/Ordinances
Blaine	Yes	Yes	Yes	No	No
Columbus	Yes	No	No	Yes	Yes

Lino Lakes	Yes	Yes	Yes	Yes	No
North Oaks	Yes	No	Yes	No	Yes
Olmsted County	Yes	Yes	Yes	Yes	Yes
St. Louis County	Yes	Yes	Yes	Yes	Yes
St. Paul	Yes	Yes	Yes	Yes	Yes
City of Ramsey	No	Yes*	Yes	Yes	Yes*

Website Focus Group

After conducting research into what other city septic pages provide we created a mock web page and hosted a focus group in order to determine if an improved website would yield greater septic maintenance understanding. With our Planning Participation Processes class we conducted a focus group to generate both qualitative and quantitative data to inform our website recommendations. We developed two components of the focus group. The first part involved a quiz to generate a measurable assessment, the second involved a discussion which was used to better understand user experience and gather qualitative data.

Quantitative Analysis

A survey was developed with basic questions regarding septic tank ownership and maintenance in the form of a google multiple choice quiz. The quiz was administered with a link to the current City of Ramsey website via email. Participants were instructed to take the quiz after spending five minutes reviewing the website. Following this, the same survey was sent out a second time, with instructions to view a new test website.

Multiple choice quiz questions were as follows:

1. State law mandates you pump your system every BLANK years.
2. What are the three main components of a septic system?
3. Improper maintenance can lead to (check all that apply):

4. As a homeowner in Ramsey, are you responsible for submitting septic tank inspection forms?
5. Were you able to find a certified pumper in the state of Minnesota from the website?

	Q. 1	Q.2	Q.3	Q.4	Q.5	Average Score of all questions
Old Site Quiz - correct answers over total answers	14/17	6/17	17/17	5/17	4/17	2.7/5
New Site Quiz - correct answers over total answers	20/22	18/22	17/22	7/22	19/22	3.7/5

The quiz and review of the City of Ramsey had 17 participants. The second quiz of review of the new site had 22 Participants. Overall participants answered more questions correctly on the second quiz, indicating an increase in septic knowledge.

There was notable improvement particularly in knowledge of the state law regarding septics and the components of a septic tank system. The same number of participants answered question 3 correctly, but on average the score decreased for the second quiz. Slightly more participants answered question four correctly. Significantly more participants located the list of septic tank maintenance companies successfully in the final question.

Qualitative Analysis

The second portion of this focus group was a discussion in small groups designed to collect qualitative information from participants. Participants were instructed to divided up into groups of five, for a total of five groups. They were given shared worksheets to discuss the following:

1. What do you like and dislike about city websites?
2. Which website did you find more useful and why?
3. What did you like about the new website?
4. What did you dislike about the new website?
5. Do you have any recommendations for the new website?

General comments regarding the old site were that the:

- Site colors and layout were fine, however the links were broken.
- It was hard to find information and there was not a lot of information.
- Participants wished they didn't have to leave the site to view information from links.

- People liked that there was winter-related information on the page up front, but were disappointed that the link didn't work.

General comments regarding the new site:

- Colors and graphics were improved.
- Links were effective.
- Layout was logical, although the top text was too large.
- Consequences of not regularly inspecting the septic tanks should be first-- ie start with "Why you should care about this."
- Information about businesses that can perform inspections was easy to find.

After conducting this research we found that communication of basic laws and practices regarding septic tanks in the City of Ramsey is essential and could be improved. The City of Ramsey could improve their site by using content from this project to educate residents and connect them to necessary resources. This focus group could be repeated to test a future site but we would recommend 1.) gathering information from more participants, 2.) allowing individuals to fill out the worksheet of questions in order to gain more input 3.) using different groups to measure data for the quiz since repeat quizzes might influence the results.

Septic Pumper Interviews

In order to gain insight into how the relationship between the City, septic tank owners, and pumpers operates, we interviewed septic pumpers in Minnesota and across the United States. Specifically we sought to understand how to increase required submission of inspection and maintenance forms. Our goal was to learn who in other communities is in charge of form submission, and if pumpers would be more willing to comply if the city offered added incentives.

First, we created an interview protocol to ensure we were asking the same questions to different pumpers so the qualitative data could be compared. The interview protocol can be found in the appendix. To remove bias and gather information on a range of cities, we decided to only interview pumpers located outside the Ramsey service area. We called twelve pumpers located in Minnesota, and across the nation, and received answers from five companies.

The answers were recorded, and then analyzed. The results were analyzed to show how many companies are in charge of submitting the form, if they would be willing to submit the forms in return for free advertising, and if they believe the incentive of free advertising would increase compliance.

Results

Table 2 shows the companies interviewed, and their location. Of the five interviewed, only one was located in Minnesota. Only two were responsible to submit documentation, two companies were not required by their counties to submit documentation, and for one the customer was responsible for submitting the documentation.

Table 2: List of Septic Pumping Companies Interviewed

Company	Location	Interviewee
Port-Able John Rental & Service Inc	Bemidji, MN	Secretary
Small Town Septic	Granby, CT	Secretary
Elite Septic	Cartersville, GA	Owner
Aarow Septic & Sewer	Woodstock, IL	Owner
A-1 Sewer Service	Windsor, WI	Owner

The two companies required to submit documentation were Elite Septic and A-1 Sewer Service. A-1 believes it would be effective for the City to, in exchange for proper documentation submissions, provide free advertising for a pumping business on their website by including them on a list of approved pumpers. Elite Septic is only required by one county to submit documentation, and does not have to submit information directly to cities. Both companies use hard copy or electronic submission depending on the county or situation. Both agreed they would be willing to handout postcard with information on how to submit the form online. The company that held the resident responsible was Port-Able John Rental & Service Inc. in Bemidji, Minnesota. The secretary was unable to answer the remaining questions, and we received no call back from the owner.

Key Messages:

Water/Environment : ***Do you know where your water goes?***

The most common water quality problem in rural water supplies is contamination from septic tanks (Waller, 2016). When septic tanks malfunction contaminated water is leaked into groundwater supplies, and subsequently surrounding public and private wells. Septic tanks malfunction when not properly maintained every 3 - 5 years. Symptoms of septic failure include: wastewater backing up into household drains, bright green grass on drainfield, pooling water around system or in the basement, and/or strong odor around the system (EPA, 2016). Wastewater follows the natural slope of the land to lower points, flowing into groundwater and surface water supplies. If a septic system malfunctions the tank and drainfield are not performing their water purification roles, causing water contaminated with harmful bacteria and other contaminants flow into the water supply.

Groundwater contamination is when man-made products get into groundwater and cause it to become unfit and unsafe for human use (Groundwater Foundation, 2017). Drinking water contaminated from a septic system can cause hepatitis, dysentery, and certain types of cancer (Groundwater Foundation, 2017). This is because wastewater leaked from septic systems contain: bacteria, viruses, household chemicals, and heavy metals. These contaminants can have a negative impact on natural resources. When excessive nutrients and bacteria enter waterways they can cause harmful algae blooms or cyanobacteria (MassDEP, 2013). Algae blooms and cyanobacteria can suffocate fish and other aquatic animals by removing oxygen. It can make swimming and other recreational activities less enjoyable or impossible. Swimmers could contract disease or infection from the contaminated water and toxic algae (MassDEP, 2013).

Health : ***Protect your family's health***

The major reason for safe disposal of sewage is to prevent the spread of disease. If a septic system is properly sited, working properly, and has been maintained regularly, it will effectively remove disease-causing bacteria. Nutrients from failing septic systems can also cause serious health problems. For example, nitrate poses a significant threat to the health of human infants. When ingested, nitrate can interfere with the blood's ability to carry oxygen, causing methemoglobinemia or "blue baby" syndrome. If left untreated, methemoglobinemia can be fatal for affected infants. (Managing Septic Systems to Prevent Contamination of Drinking Water, 2001).

Proper operation and maintenance of septic systems is the most crucial preventative measure for preventing contamination. Inadequate septic system operation and maintenance can lead to failure, even when systems are designed and constructed according to regulations. According to the EPA, inadequately treated sewage from failing septic systems is the most frequently reported cause of groundwater contamination (Managing Septic Systems to Prevent Contamination of Drinking Water, 2001). Inadequately treated sewage from failing septic systems poses a significant threat to drinking water and human health because diseases and infections may be transferred to people and animals directly through water sources. Dysentery, hepatitis, typhoid fever, and acute gastrointestinal illness are some of the more serious examples of illnesses passed through failing septic systems.

Economics ***Save your septic save your money***

Regular septic system care and maintenance is essential for homeowners as doing so not only results in extended life of the system, but saves homeowners money as well. Although there are numerous strategies to employ for preventing damage to a septic system, the most foundational tactics to lengthen septic life and save homeowners moneys in regular inspection and pumping. On average, a traditional septic system lasts 15 to 40+ years (Cost and Funding, 2017). Installation of a system varies per system type but on average costs between $3,000-$10,000 (for high end, custom tank systems) and on average over a 20 year period annual costs amount to between $6,3000-$13,000 (Cost and Funding, 2017). Although annual costs for inspection and pumping over 20 years may appear high, for a traditional or mound septic system this equates to roughly $30-$500 annually (Custom Septic Inc., 2016). These annual costs vary widely, as they depend on household size, total wastewater generate, volume of solids, and septic tank size (Why Maintain Your Septic System, 2017); inspection and pumping frequency depends on the aforementioned variables. Regular inspection and pumping, done at least every 3 years, is critical as systems are likely to fail within 3-10 years if not maintained (Cost and Funding, 2017). If not maintained average repair/replacement costs can vary between $3,000 and $7,000 according to the EPA (Why Maintain Your Septic System, 2017). Lack of maintenance can also affect homeowners looking to sell, as necessary repair to, or replacement of, the system will result in fees due in escrow (Subsurface Sewage Treatment System Ordinance, 2017).

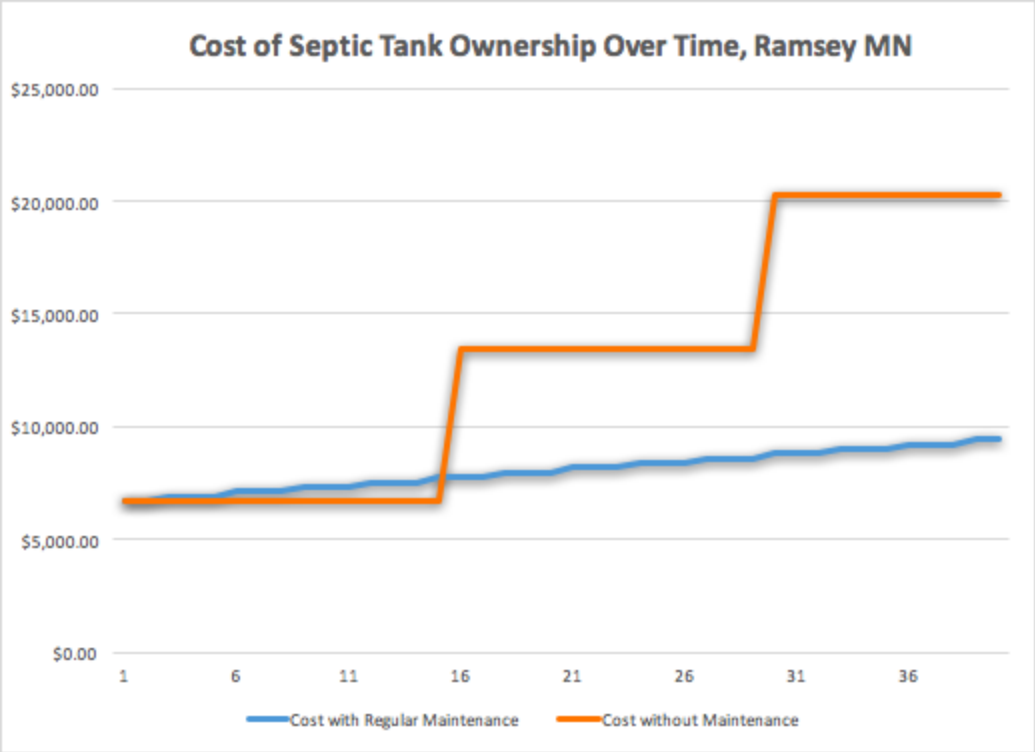
Often times the “out of sight out of mind” mindset contributes to a lack of regular maintenance (Cost and Funding, 2017). A lack of information or understanding can also inhibit residents from properly caring for the septic systems (Silverman, 2005). Information that is not readily available

or is too hard to find may detract people from learning more and if permits and forms are too hard to find may deter people from performing proper maintenance requirements (Silverman, 2005). In addition to actual costs, misunderstandings regarding prices and fees of permits and pumping may detract homeowners from seeking necessary pumping requirements (Silverman 2005). Low interest loans, like the Anoka County Well and Septic Repair Loan (Well and Septic Repair, 2017, are available yet may not be capitalized on if information about them is not well known or easy to find.

A lack of accountability can also contribute to a lack of septic system maintenance. If rules and regulations are not easily accessible or given to residents, they may not be aware of the city or state septic requirements. Although citations for inspections, pumping, and replacement can be given by municipalities or through the DNR or MNPCA, they may be too expensive for some municipal agencies, and in some cases too expensive for the state as well (Subsurface Sewage Treatment System Ordinance, 2017).

Septics & Pay-Off in Ramsey

According to consumer sites like Manta and Home advisor, the average cost for septic tank installation or replacement in Ramsey, Minnesota is $6,647 and $6,750 respectively (Manta, 2017). Home Advisor lists the average cost of septic tank maintenance in the region is $210 (Home Advisor, 2017. If the maximum life of a septic tank is 10 years without maintenance, and with regular maintenance a tank can last up to 40 years a homeowner would easily save over $10,000 in that time.



See Appendix A for aggregated data.

The cost of regular maintenance pays off in the life and longevity of the tank alone. However, if a septic tank fails there are more costs that would be added, including harmful impacts to the environment, groundwater, and residents.

When a home is sold in Ramsey the city requires a point of sale inspection. If a septic tank is not found in compliance with Minnesota law then the homeowner has twelve months to bring the septic tank into compliance (City of Ramsey, 2017). Lack of maintenance could bring an unplanned expenses that could either disrupt the sale of a home or add complications to the sale.

*Money Saving Techniques : **Little Changes go a long way***

There are six crucial factors that have the most influence on frequency of septic pumping needs and overall life of the system (EPA, 2017):

1. Household size-this will have a great deal of influence on the amount of waste being sent to the septic system for treatment

2. Size and effectiveness of a septic tank-greatly influences the volume of waste that can be treated
3. Amount of wastewater-utilizing proven methods to reduce water use will send less liquid waste to the septic system
4. Amount of solid waste-minimize the amounts of solid waste entering the system
5. Proper initial installation-use trusted contractors and properly site septic system upon construction
6. Health of the septic microbiome-trillions of naturally occurring microorganisms are needed to break down waste

Additionally, there are many ways to enhance septic system longevity as stated below (EPA, 2017; FloHawks, 2017):

A. Do not dispose of grease/fats down the septic system as it prevents soil from absorbing liquids
B. Only allow biodegradable waste into your septic system
C. Do not discharge caustic materials into septic system because it can corrode physical septic system, pollute groundwater, and eliminate crucial microorganisms
D. Do drive over or construct buildings on your drainfield as it compacts soil that potentially interferes with the final stage of septic treatment
E. Keep the drainfield relatively dry for effectiveness
F. Have vegetation planted on drainfield to minimize soil erosion
G. Keep tree roots 100 feet or more away from septic systems to prevent physical damage
H. Do not overwhelm your septic system by a sudden drain of hot tubs or other unusually large volumes of wastewater
I. Employ a variety of water saving measures to minimize the amounts of other wastewater
J. Keep accurate records of all septic maintenance activities and events. It is beneficial to the homeowner for proper maintenance and are a valuable resource if someone is selling their house with a septic system
K. Have your septic system inspected annually by a licensed professional
L. Use septic safe products when possible (soap, toilet paper, wet wipes, etc.)
M. Consider using additives to stressed septic systems both of organic solvents and additional biological microorganisms

Recommendations:

1. *Database improvements*

In order to facilitate proper septic maintenance for the good of residential property values and groundwater quality, Ramsey should implement a complete database of records to keep track of all local septic systems. This would benefit a great variety of stakeholders as well as the overall community. For Ramsey homeowners it will provide an easily accessible record of their septic maintenance actions to get the maximum longevity and economy out of their septic system. For potential home buyers these records will be an invaluable information resource and will serve to motivate current homeowners to practice proper septic maintenance. For septic servicing companies these records will provide way to precisely and competitively market to Ramsey clients according to regular maintenance schedules for achievement of best practices.

Currently, there is a partial GIS database of Ramsey residential septic systems. These records should be made complete and solicit as much past information available from local septic service companies and homeowners as is possible. Moving into the future, Ramsey should solicit the local septic service providers to voluntarily submit records in a timely manner using the benefits of precise marketing as motivation. To this end there should be a user interface that will allow input from verified septic service professionals directly into the GIS database by record matching. To further facilitate voluntary compliance septic companies would have the option of submitting their records in writing in batches and having the data entered by city staff. In addition homeowners would have the option to submit written records to city staff to be entered into the database after verification.

<u>Inspection form submission</u>

To make a database effective, the ways in which inspection and maintenance forms are submitted must be examined. Inspection and maintenance forms inform the City on when residents with septic tanks had these services performed, which should occur every three years. With this information, the City could send out targeted mailings to remind residents they are due for inspection, and/or cite households that not complying. Currently, the City of Ramsey relies on the pumpers to submit inspection and

maintenance forms on specific households after performing these services, a process that has thus far proven to be unreliable.

In order to determine possible solutions for Ramsey, we interviewed five different pumpers in order to get a clearer picture of what other cities require, and what pumping companies would be willing to do. Of the five, only two were required to submit inspection forms. These interviews and our research resulted in three different options Ramsey can explore to increase septic inspection and maintenance form submission compliance. The first two options explore scenarios where the City maintains it is the pumper's responsibility to submit the required form, in the last option the City would make the resident responsible for submitting the form.

Pumper is Responsible

The first option the City can initiate would provide an incentive for the pumper to submit the forms. In exchange for free advertising on the City website, the pumper would agree to comply to regularly submit the inspection and maintenance form. If the pumper fails to submit all forms, the City would hold the right to remove the pumper from the website's list of certified and recommended pumpers. Both pumping companies agreed they would find this helpful, and would provide a greater incentive for submitting.

The second option the City can help to initiate would be to recommend the pumper charge an additional fee to the homeowner to submit the required forms to the City. This would increase the pumpers incentive to submit the forms, and would provide assurance they would follow through. The fee could range from $5 to $20. The homeowner would be willing to pay the fee for their convenience, and the pumper would increase their profits.

Homeowner is Responsible

The final option the City can explore is switching to make it the homeowners responsibility to submit the required forms after their septic tank has been pumped and inspected. Our interviews show that in other Minnesota towns the homeowner holds this responsibility. In order to increase homeowner compliance in Ramsey, Ramsey could ask pumpers if they would be willing to hand out postcards to the residents after performing their services. The postcards would include information on the form and a link to the City

website where they can find an electronic form for them to submit. By reminding homeowners during the time of inspection to submit documentation online, homeowners may be more likely to understand and/or remember to do so. Two pumping companies we contacted agreed that they would be willing to hand out postcards. However one company, Elite Septic, did recommend that the pumpers should be in charge of submitting paperwork, not homeowners.

Overall an increase in compliance would in turn make the online database a useful tool to ensure that homeowners are maintaining their systems. Therefore it is recommended that Ramsey explore the aforementioned options and pursue implementing one or more to their current septic practices.

2. Website

It is recommended that Ramsey update their current septic system page in order to provide residents with more robust and relevant information. By making the web page more interactive, user friendly, and informative, residents will be better able to find information or forms they need in order to understand and properly care for their septic systems. With increased ease in locating necessary information, residents will be more likely to utilize the website which would then result in increased septic pumping and maintenance.

The current web page for Ramsey is outdated as, out of the six web links provided, one is broken and another does not bring users to the correct page. In order to make the web page more user friendly and to better engage users, Ramsey should update the existing links.

Additionally the current page lacks Ramsey specific permits or forms, relevant codes/ordinances, and information or access to licensed pumpers. It is recommended that Ramsey add this information as all of the cities/counties reviewed in our literature review present permits and forms for their residents on their septic page. Similarly, all reviewed web pages but one have information regarding codes or ordinances. Information or links to licensed pumpers would also ease the difficulty users might have in finding that information. By providing important relevant information, users will be able to locate and fill out necessary documents when looking to build, pump, or maintain septic systems.

In regards to page layout, it is important that information is easy to locate and understand. Although the web page contains important information for residents, some of the current information is hard to get to (broken links), links lack relevant descriptions, and the current description regarding systems and maintenance is limited. By fixing links and giving link descriptions, expanding on current septic maintenance information, and providing explanations as to why maintenance is important and how to do it, users will be able to better locate and understand needed information. Additionally, displaying an image of how septic systems work, providing bullet-listed care tips, and making contact information more apparent will make users more engaged with the content presented (Kyrnin, 2017).

Using the suggestions discussed above, we have formatted a potential website outline, found in the link located in the Appendix C. This webpage was piloted tested in a focus group in order to determine if septic system maintenance comprehension was enhanced and to determine if the layout was more user friendly. The results of the focus group indicate that there was an increase in awareness and understanding of maintenance, and that the webpage was easier to use. Therefore, Ramsey should seek to implement similar changes to their current webpage.

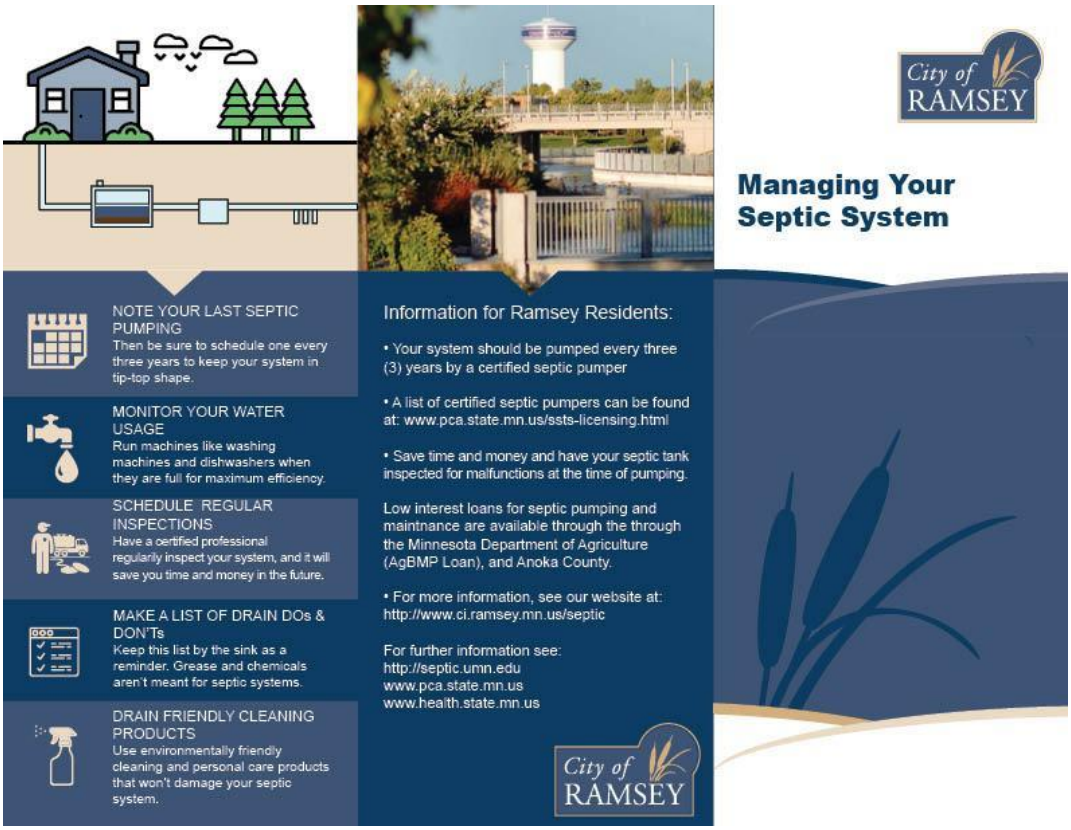
3. *Brochure and Postcard*

Several of the cities we researched utilized a postcard notification system which alerts homeowners when they are due to pump or inspect their septic system. We propose that postcards should be sent out to all homeowners with septic systems every two or three years, to provide a reminder to pump their system. This postcard has been designed using Ramsey's branding guidelines, and provides information on why septic pumping and inspections are important, how to find a certified septic pumper, and the associated fees. The InDesign file will be included with this report, and is editable as information or ordinances change.


It's that time of year again...
Pump your septic system to protect your health and wealth!
cityoframsey.com
City of RAMSEY
City of RAMSEY
Homeowner,
According to our records, it has been at least 3 years since you have had your septic system pumped. The city of Ramsey requires that each household with a septic system pump their tank every 3 years.
Visit www.pca.state.mn.us/ssts-licensing.html to find a list of certified septic pumpers.
For permitting and fee information, please visit our website at: http://www.ci.ramsey.mn.us/septic
Pumping your septic system...
Protects your property value
Protects the health of your family, water, and environment
Saves money in the long-run

i. Brochure

We have created a brochure that outlines basic information relating to septic systems. This includes the components, functions, best management practices, property value concerns, health and environmental concerns, additional resources, and where to find a certified septic pumper. This brochure should be included in the new homeowner packet, handouts at city events such as Happy Days, and uploaded on the Ramsey's website. This brochure has been designed following Ramsey's branding guidelines, and the InDesign file will be included with this report. This file is editable and can be modified as septic ordinances change, or new information becomes available.



4. *Septic Awareness Week*

While for reasons given earlier in this paper education alone is not effective, studies have still shown educational outreach can increase participation (Silverman 2005). Septic Smart Week is a national event to educate and build awareness around septic tank maintenance. The City of Ramsey, as it has in the past, can use this week to build

awareness around septic tank maintenance. Listed in Appendix D are the guidelines for a communications campaign including key communications strategies, a timeline and important messages. An effective outreach plan uses both social media and earned media (press) to deliver the message. This outreach strategy can be reinforced by traditional mailings and emails in order to fill in communication gaps. Septic Smart Week could also be a great opportunity to unveil an improved City of Ramsey septic page. Since Septic Smart Week takes place typically two weeks after Happy Days, Septic Smart Week tools could be launched at a booth during that weekend. Appendix D includes an overview of tools, timeline, the checklist for the Happy Days booth, a sample press release, and key messages.

5. Ordinance Improvements

The City of Ramsey's ordinance is in accordance with State Law, and states that septic tanks need to be inspected at a minimum every three years and before the sale of a home. Additionally it includes guidelines regarding construction and the threat of misdemeanor if the homes are not in compliance. While these guidelines are important, what could strengthen the ordinance is a fiscal incentive or penalty. Unfortunately studies have shown that since homeowners typically do not directly see the impacts of water pollution caused by their septic tanks, they are more likely to put off maintenance (Mohamed 2009). Furthermore because economic assistance is provided in Anoka and the State of Minnesota for emergency issues, non-compliance is further incentivized (Mohamed 2009). An improved ordinance should include an economic disincentive for non-compliance in inspections; the City of Ramsey could assess a fee for non-compliance issued on a regular basis. With the addition of improved data practices and forms as mentioned above, if inspection is not reported to the City, the City of Ramsey could then assess a fee. This fee could be greater than the cost of a voluntary inspection and/or could include an inspection by a septic tank inspector contracted by the city.

Appendices

Appendix A:

Below is a cost estimate chart comparing how much a septic owner could save by performing routine maintenance on the system, as opposed to foregoing maintenance:

Year	**Cost of System with Maintenance**	**Cost of System without Maintenance**
1	$6,700.00	$6,700.00
2	$6,700.00	$6,700.00
3	$6,910.00	$6,700.00
4	$6,910.00	$6,700.00
5	$6,910.00	$6,700.00
6	$7,120.00	$6,700.00
7	$7,120.00	$6,700.00
8	$7,120.00	$6,700.00
9	$7,330.00	$6,700.00
10	$7,330.00	$6,700.00

11	$7,330.00	$6,700.00
12	$7,540.00	$6,700.00
13	$7,540.00	$6,700.00
14	$7,540.00	$6,700.00
15	$7,750.00	$6,700.00
16	$7,750.00	$13,400.00
17	$7,750.00	$13,400.00
18	$7,960.00	$13,400.00
19	$7,960.00	$13,400.00
20	$7,960.00	$13,400.00
21	$8,170.00	$13,400.00
22	$8,170.00	$13,400.00
23	$8,170.00	$13,400.00
24	$8,380.00	$13,400.00
25	$8,380.00	$13,400.00
26	$8,380.00	$13,400.00

27	$8,590.00	$13,400.00
28	$8,590.00	$13,400.00
29	$8,590.00	$13,400.00
30	$8,800.00	$20,250.00
31	$8,800.00	$20,250.00
32	$8,800.00	$20,250.00
33	$9,010.00	$20,250.00
34	$9,010.00	$20,250.00
35	$9,010.00	$20,250.00
36	$9,220.00	$20,250.00
37	$9,220.00	$20,250.00
38	$9,220.00	$20,250.00
39	$9,430.00	$20,250.00
40	$9,430.00	$20,250.00

Appendix B:

The interview protocol was used to ensure that questions being asked to each pumper interviewed were uniform. The script focused on obtaining information relating to current incentives for documentation submission, who is in charge of submitting documentation, and what pumpers opinions were on proposed incentives. The goal was to find a proposed recommendation that would incentivize pumpers to conform to the required maintenance documentation submission.

Interview Protocol:

Intro: Hello, I am a graduate student at the University of Minnesota. I am currently working on a project for a city within the Twin Cities Metro Area on how to best engage the residents to properly maintain their septic systems. I was wondering if I could ask you a few questions about your business and how you work with the City's you provide service to.

1. One of the major issues our City is facing is its lack of data on when septic tanks were last pumped and inspected. Do you believe it would be effective for the city to, in exchange for proper documentation submissions, provide free advertising for a pumping business on their website by including them on a list of approved pumpers?

2. Have you experienced any barriers or problems when submitting the documentation?

3. Do you typically submit the documentation electronically or by hard copy?
    a. If by hard copy:
        i. Would you be willing to submit the forms electronically?

4. What do you believe would be the best way to increase submission of the documentation?

5. If the homeowner is responsible for submitting form would you be willing to hand out a postcard with information on how to submit the form online?

6. Is there anything that you think is important I haven't asked you about or you would like to elaborate on so we can better understand your story?

Thank you for your time! You appreciate your help with this matter.

Appendix C:

In order to visually display potential website enhancements, a mock website page was created for Ramsey. Changes to content and design were drafted and implemented to the new page in order to make a webpage that is informative and user friendly. The link to the webpage template follows: https://septicsystem.weebly.com/

The webpage was tested in a focus group

Appendix D:

The Septic Smart Week media toolkit was created for the City of Ramsey to use during National Septic Smart Week and to assist with other community events they may wish to attend. It includes a plan overview, a press release to raise awareness, and key talking points to help educate the booth's operator, and to help tailor the message to different events.

Septic Smart Week - Media Tool Kit:

I. Plan Overview
II. Press Release
III. Talking Points

I. Plan Overview & Timeline

Septic Smart Week is an annual event that was initiated to educate and build awareness around Septic Tank Maintenance. The City of Ramsey can use this opportunity to build awareness around septic tank maintenance. Listed below are the guidelines for a communications strategy including key communications strategies, a timeline and important messages.

Key Communication Strategies:

- Earned Media: Use the press release below to alert local media of the event. Use the talking points below to communicate key messages.
- City of Ramsey Communications: Septic Smart Week should be listed on the site homepage, on the city newsletter, and in email blasts.
- Bring Materials to Happy Days for a Septic Smart Week Awareness Booth.
- Business incentives: Partner with a Business to advertise the business in exchange for discounts for city residents.

Timeline for Summer & Fall 2018:

- July:

    - Identify a business partner for possible pumping and inspection discounts.
    - Update the City of Ramsey Septic Page
- August:
    - Prepare postcard for mailing
    - Prepare article for City Newsletter
    - Secure Happy Days Booth
    - Schedule Time on local Access show
    - Contact Local Radio Station to schedule Radio ad
- September 3-7th:
    - September 3: Post Materials on Website, Send out Mailer
    - Sept 7th, 8th, 9th- Happy Days Booth
- September 10th-14th
    - September 10th: Find additional quotes for press release.
    - September 11th: Find contacts for press in Ramsey
    - September 14th: Send out Press Release
- September 17th-21st:
    - Schedule an additional event
    - Be Available for Questions

Key Messages:

- *Water/Environment:*
    - ***Do you know where your water goes?***
    - ***Protect your family's health***
- *Economics:*
    - ***Save your septic, save your money***
        - Septics & Pay-Off in Ramsey
- *Money Saving Techniques:*
    - ***Little Changes go a long way!***

Outreach Booth Checklist:

- Talking Points
- Pamphlets for Hand Outs
- Coupon/Business Info
- Practice Script

II. Press Release

City of Ramsey
Contact: Rick Jarson, Building Official, City of Ramsey
Phone: 763-433-9849
Email:rjarson@cityoframsey.com

September 17, 2018
For Immediate Release

The City of Ramsey is celebrating Septic Smart Week as part of a national effort to educate the public about septic tank use. The week begins Today, Monday September 17, 2018 and goes through Friday.

45% of the homes in Ramsey use Septic Tanks for a total of 4,000 septic systems city-wide. A well maintained septic system can last up to 40 years. However, systems can periodically break down causing unseen leaks underground and flooding above ground. According to _____ expert in Community Health, this can have negative impacts on health as well as the environment. "What people may not know" says _____ "is that leaks can contaminate groundwater and this can make people sick"

According to Rick Jarson, septic maintenance is not only important to health and groundwater, it can save money. "What a lot of homeowners don't know is that proper maintenance can extend the life of your system" Rick said that a new system typically costs around 6,000. "If you keep on inspection and pumping, over 40 years you will save well over 10,000."

Many homeowners do not realize there is a septic tank problem until they are ready to sell their home. The mandatory inspection at the point of sale can reveal that the septic tank needs to be replaced which adds unforeseen costs and can interrupt the sale.

The City of Ramsey ordinance follows state law, which requires residents to have their septic tanks inspected by a professional every three years. For more information please see the City of Ramsey's website : www.ci.ramsey.mn.gov/septic or contact the City of Ramsey Building Division at 763.433.9850.

III.

Talking Points/Key Messages

Water/Environment: ***Do you know where your water goes?***

- The most common water quality problem in rural water supplies is contamination from septic tanks.
- When septic tanks malfunction contaminated water is leaked into groundwater supplies, and subsequently surrounding public and private wells. Symptoms of septic failure include: wastewater backing up into household drains, bright green grass on drainfield, pooling water around system or in the basement, and/or strong odor around the system.
- If a septic system malfunctions the tank and drainfield are not performing their water purification roles, causing water contaminated with harmful bacteria and other contaminants flow into the water supply.
- When excessive nutrients and bacteria enter waterways they can cause harmful algal blooms or cyanobacteria. Algae blooms` and cyanobacteria can suffocate fish and other aquatic animals by removing oxygen. It can make swimming and other recreational activities less enjoyable or impossible. Swimmers could contract disease or infection from the contaminated water and toxic algae.

Health: ***Protect your family's health***

- The major reason for safe disposal of sewage is to prevent the spread of disease. If a septic system is properly cited, is working properly, and has been maintained regularly, it will effectively and efficiently remove disease-causing bacteria. In Ramsey alone, thousands gallons of waste per year is disposed of below the ground's surface from individual septic systems.
- Nutrients from failing septic systems can also cause serious health problems. For example, nitrate poses a significant threat to the health of human infants. When ingested, nitrate can interfere with the blood's ability to carry oxygen, causing methemoglobinemia or "blue baby" syndrome. If left untreated, methemoglobinemia can be fatal for affected infants.
- Drinking water contaminated from a septic system can cause hepatitis, dysentery, and certain types of cancer. This is because wastewater leaked from septic systems contain: bacteria, viruses, household chemicals, and heavy metals.

Economics: ***Save your septic save your money***

- On average, a traditional septic system lasts 15 to 40+ years (Cost and Funding, 2017). Installation of a system varies per system type but on average costs between $3,000-$10,000 (for high end, custom tank systems) and on average over a 20 year period annual costs amount to between $6,3000-$13,000 (Cost and Funding, 2017).
- These annual costs vary widely, as they depend on household size, total wastewater generate, volume of solids, and septic tank size (Why Maintain Your Septic System); inspection and pumping frequency depends on the aforementioned variables. Regular inspection and pumping, done at least every 3 years, is critical as systems are likely to fail within 3-10 years if not maintained (Cost and Funding, 2017).
- If not maintained average repair/replacement costs can vary between $3,000 and $7,000 according to the EPA. Lack of maintenance can also affect homeowners looking to sell, as necessary repair to, or replacement of, the system will result in fees due in escrow (Subsurface Sewage Treatment System Ordinance, 2017).
- In addition to actual costs, misunderstandings regarding prices and fees of permits and pumping may detract homeowners from seeking necessary pumping requirements (Silverman, 2005). Low interest loans, like the Anoka County Well and Septic Repair Loan (Well and Septic Repair, 2017), are available yet may not be capitalized on if information about them is not well known or easy to find.

<u>Septics & Pay-Off in Ramsey</u>

- According to consumer sites like Manta and Home advisor, the average cost for septic tank installation or replacement in Ramsey, Minnesota is $6,647 and $6,750 respectively. Home Advisor lists the average cost of septic tank maintenance in the region is $210. If the maximum life of a septic tank is 10 years without maintenance, and with regular maintenance a tank can last up to 40 years a homeowner would easily save over $10,000 in that time.
- When a home is sold in Ramsey the city requires a point of sale inspection. If a septic tank is not found in compliance with Minnesota law then the homeowner has twelve months to bring the septic tank into compliance. Lack of maintenance could bring an unplanned expenses that could either disrupt the sale of a home or add complications to the sale.

*Money Saving Techniques: **<u>Little Changes go a long way</u>***

How often do I need to pump (EPA, 2017)? It depends on:

1. Household size: has a great deal of influence on the amount of waste being sent to the septic system for treatment.
2. Size and effectiveness of a septic tank: greatly influences the volume of waste that can be treated.
3. Amount of wastewater: utilizing proven methods to reduce water use will send less liquid waste to the septic system.
4. Amount of solid waste: minimize the amounts of solid waste entering the system.
5. Proper initial installation: use trusted contractors and properly site septic system upon construction.
6. Health of the septic microbiome: trillions of naturally occurring microorganisms are needed to break down waste.

Usage Tips (EPA, 2017: FloHawks, 2017):

A. Do not dispose of grease/fats down the septic system as it prevents soil from absorbing liquids.
B. Only allow biodegradable waste into your septic system.
C. Do not discharge caustic materials into septic system because it can corrode physical septic system, pollute groundwater, and eliminate crucial microorganisms.
D. Do not drive over or construct buildings on your drainfield as it compacts soil that potentially interferes with the final stage of septic treatment.
E. Keep the drainfield relatively dry for effectiveness.
F. Have vegetation planted on drainfield to minimize soil erosion.
G. Keep tree roots 100 feet or more away from septic systems to prevent physical damage.
H. Do not overwhelm your septic system by a sudden drain of hot tubs or other unusually large volumes of wastewater.
I. Employ a variety of water saving measures to minimize the amounts of other wastewater.
J. Keep accurate records of all septic maintenance activities and events. It is beneficial to the homeowner for proper maintenance and are a valuable resource if someone is selling their house with a septic system.
K. Have your septic system inspected annually by a licensed professional.
L. Use septic safe products when possible (soap, toilet paper, wet wipes, etc.).
M. Consider using additives to stressed septic systems both of organic solvents and additional biological microorganisms.

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