SOUTH DAKOTA
Association of Rural Water Systems

Quality On Tap!

July 2018 | Volume 14, Issue 1

SYSTEM SPOTLIGHT:
BROOKINGS-DEUEL
RURAL WATER SYSTEM

STATEWIDE GROUND WATER QUALITY MONITORING NETWORK

WELL.... WHAT DO WE HAVE HERE?
DEALING WITH ABANDONED WELLS

MEET OUR NEW EXECUTIVE DIRECTOR | GOLF TOURNAMENT JULY 17

A MESSAGE FROM THE PRESIDENT OF THE BOARD

Ron Gillen, President
South Dakota Association of Rural Water Systems

Golf Tournament

Join us on July 17th for the 32nd Annual SDARWS 4-Person Scramble Golf Tournament at Elmwood in Sioux Falls. The tournament is a great opportunity to gather together with other Rural Water folks for a day of camaraderie and fun. You can register your four-person team online at www.sdarws.com/golf.html. All golfers need to be registered at the course by 8:30am. Shotgun start is at 9:00am. We hope to see you on the course!

WaterPro Conference

It isn't too early to start thinking about attending this year's WaterPro Conference in Fort Worth, Texas September 17-19, 2018. NRWA puts on a fantastic show which brings in hundreds of vendors and hosts informative training sessions in operations, management, boardsmanship and governance for those involved in water and wastewater utility systems – large and small, municipal and rural. WaterPro features expert speakers from across the water/wastewater industry. Want to hear about new USDA projects or EPA priorities? You can find out at the WaterPro Conference. The WaterPro exhibit hall is filled with vendors and service-providers dedicated to offering high-quality solutions for small and rural water utilities. Find out about all the best solutions for rural water today and tomorrow. For more information on this conference, including registration and hotel reservations, please visit waterproconference.org.

Riparian Buffer Tax Credit

South Dakota property owners with eligible riparian buffer strips have until October 15, 2018 to apply for a property tax incentive.

As a result of 2017's Senate Bill 66, landowners may receive a reduction in property value of 40 percent of any eligible riparian buffer strip. The bill specifies 575 lake listings and 11,000 miles of streams that are eligible.

To be eligible, applicants must meet the following requirements:

Only land that adjoins qualified lakes and streams is eligible to be enrolled in the program. Maps of all qualified lakes and streams for every county may be accessed at http://denr.sd.gov/datagis.aspx.

Applications are to be submitted to the Director of Equalization in the county where the property is located. Eligible applicants will receive tax relief for their 2018 assessment – taxes payable 2019.

For more information, visit http://dor.sd.gov/bufferstrips.aspx

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Les Hinds

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Rick Doud

Class B East River
Ronald Neeman

Class B West River
Robert Glenn

Class C
Dan Ostrander

Events Calendar

JUNE

28 – SUSTAINABLE MANAGEMENT OF RURAL AND SMALL SYSTEMS WORKSHOP

Mitchell Highland Conference Center
2000 Highland Way • Mitchell, SD
The workshop focuses on ten key management areas of effectively managed utilities, which make up a framework for a complete and well-rounded management approach. By making operational improvements in any of these areas, your utility will be able to deliver increasingly efficient, high quality services to your community.

This workshop is geared towards small water and wastewater systems and finance officers, mayors, city council members, and water/wastewater management are all encouraged to attend.

JULY

10-12 – BASIC WATER TREATMENT

Huron Crossroads Hotel
100 4th Street SW • Huron, SD
This course covers the Association of Boards of Certification "Need to Know" requirements for the Class I & II Water Treatment Exams. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

17 – RURAL WATER GOLF OPEN

Elmwood Golf Course
2604 Russell Street • Sioux Falls, SD
Make plans to join South Dakota Rural Water and our other Rural Water friends for an enjoyable day of camaraderie and fun! Registration includes: 18 holes of golf, riding cart, luncheon & prizes! Register online at sdarws.com or: tinyurl.com/SDARWSGOLF

AUGUST

7-9 – WATER DISTRIBUTION

Aberdeen Ramkota
1400 8th Avenue NW • Aberdeen, SD
This course covers the Association of Boards of Certification "Need to Know" requirements for the Class I through III Water Distribution Exams. This course only covers the material for Water Distribution. Operations Specialists who wish to attempt a Wastewater Collection Exam should attend the Wastewater Collection Course. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

28-30 – WASTEWATER COLLECTION

Watertown Events Center
1901 9th Avenue SW • Watertown, SD
This course covers the Association of Boards of Certification "Need to Know" requirements for the Class I through III Wastewater Distribution Collection Exams. This course only covers the material for Wastewater Collection. Operations Specialists who wish to attempt a Water Distribution Exam should attend the Water Distribution Course. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

SEPTEMBER

25-27 – INTERMEDIATE WATER TREATMENT

Spearfish Holiday Inn
305 N. 27th Street • Spearfish, SD
This course covers the Association of Boards of Certification "Need to Know" requirements for the Class II & III Water Treatment Exams. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

OCTOBER

16 – BASIC WASTEWATER TREATMENT

Rapid City Ramkota
2111 N. LaCrosse Street • Rapid City, SD
This course covers the Association of Boards of Certification "Need to Know" requirements for the Class I & II Wastewater Treatment Exams. This course does not cover the material included in the Stabilization Pond Exam. Operators who will be attempting the Stabilization Pond exam should consider the Stabilization Pond Workshops. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

30 – STABILIZATION POND WORKSHOP

Aberdeen Ramkota
1400 8th Avenue NW • Aberdeen, SD
This course covers the material on the Association of Boards of Certification Stabilization Pond Exams. It does not cover material on Class I or higher Wastewater Treatment Exams. This is a single day workshop starting at 8:30 a.m. local time and wrapping up around 4:30 p.m.

REGISTER FOR CLASSES ONLINE AT:
go.activecalendar.com/sdarws

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WHAT IS SOIL HEALTH
AND WHY SHOULD YOU CARE?

Soil health is "the capacity of a soil to function" (Doran and Parkin 1993). How well is your soil functioning to infiltrate water and cycle nutrients to water and feed growing plants?

Soil is a living factory of macroscopic and microscopic workers who need food to eat and places to live to do their work. There are more individual organisms in a teaspoon of soil than there are people on earth; thus, the soil is controlled by these organisms.

Tillage, fertilizer, livestock, pesticides, and other management tools can be used to improve soil health, or they can significantly damage soil health if not applied correctly.

Managing for soil health (improved soil function) is mostly a matter of maintaining suitable habitat for the myriad of creatures that comprise the soil food web.

Managing for soil health can be accomplished by disturbing the soil as little as possible, growing as many different species of plants as practical, keeping living plants in the soil as often as possible, and keeping the soil covered all the time.

MANAGE MORE BY DISTURBING SOIL LESS

Tilling the soil is the equivalent of an earthquake, hurricane, tornado, and forest fire occurring simultaneously to the world of soil organisms. Simply stated, tillage is bad for the soil.

Physical soil disturbance, such as tillage with a plow, disk, or chisel plow, that results in bare or compacted soil is destructive and disruptive to soil microbes and creates a hostile, instead of hospitable, place for them to live and work.

MANAGING FOR SOIL HEALTH MUST BEGIN BY CHANGING THE WAY YOU THINK ABOUT SOIL

The soil may also be disturbed chemically or biologically through the misuse of inputs, such as fertilizers and pesticides. This disrupts the symbiotic relationship between fungi, microorganisms and crop roots.

By reducing nutrient inputs, we can take advantage of the nutrient cycles in the soil to supply crop nutrients and allow plants to make essential associations with soil organisms.

DIVERSITY WITH CROP DIVERSITY

Sugars made by plants are released from their roots into the soil and traded to soil microbes for nutrients to support plant growth. The key to improving soil health is assuring that the food and energy chains and webs includes as many different plants or animals as practical.

Biodiversity will ultimately be the key to success of any agricultural system. Lack of biodiversity severely limits the potential of any cropping system and disease and pest problems are increased.

A diverse and fully functioning soil food web provides for nutrient, energy, and water cycling that allows a soil to express its full potential.

GROW LIVING ROOTS THROUGHOUT THE YEAR

There are many sources of food in the soil that feed the soil food web, but there is no better food than the sugar exuded by living roots.

Soil organisms feed on sugar from living plant roots first. Next, they feed on dead plant roots, followed by above-ground crop residues, such as straw, chaff, husks, stalks, flowers, and leaves. Lastly, they feed on the humic organic matter in the soil.

Healthy soil is dependent upon how well the soil food web is fed. Providing plenty of easily accessible food to soil microbes helps them cycle nutrients that plants need to grow.

KEEP THE SOIL COVERED AS MUCH AS POSSIBLE

Soil should always be covered by growing plants and/or their residues, and soil should rarely be visible from above. This is true regardless of land use (cropland, hayland, pasture, or range). Soil cover protects soil aggregates from 'taking a beating' from the force of falling raindrops. Even a healthy soil with water-stable aggregates (held together by biological glues) that can withstand wetting by the rain may not be able to withstand a 'pounding' from raindrops.

A mulch of crop residues on the soil surface suppresses weeds early in the growing season giving the intended crop an advantage. They also keep the soil cool and moist which provides favorable habitat for many organisms that begin residue decomposition by shredding residues into smaller pieces.

SOIL HEALTH FOR YOUR FARM, RANCH... FOR YOU!

Soil health is improved by disturbing the soil less, growing the greatest diversity of crops (in rotation and as diverse mixtures of cover crops), maintaining living roots in the soil as much as possible (with crops and cover crops), and keeping the soil covered with residue at all times. Drills, planters, seed, fertilizer, pesticides, livestock, fences, water, farm implements, etc. are all tools that can be used to manage the soil habitat for the benefit of living members of the soil food web.

Many soils have a water infiltration problem that causes a water runoff problem. If soil health is improved, the structure of the soil results in greater water infiltration, less runoff, less or no erosion, and reduced incidence of flooding and sedimentation.

Content provided by the South Dakota Natural Resources Conservaton Service (NRCS). For more information on soil health, visit www.nrcs.usda.gov/wps/portal/nrcs/main/sd/soils/health/

Well... WHAT DO WE HAVE HERE?

Abandoned wells exist throughout South Dakota and tap into every principle aquifer in the state. These are the same aquifers that we rely on today for much of the drinking water used in South Dakota. While the actual number of abandoned wells is not known, it is possible to make some reasonable estimates of the number of abandoned wells. In 1910, South Dakota had approximately 78,000 farms which reached a maximum of 84,300 farms in 1932. Since that time, farm numbers have declined steadily to about 31,700 today. Therefore, South Dakota has lost approximately 52,600 farms that likely had at least one well which may now be abandoned.

Aside from the reduction in the number of farmsteads, other factors have also contributed to the creation of abandoned wells. Rural electrification provided power to farmsteads that may have allowed access and pumping from more reliable, but deeper, aquifers. Similarly, regional rural water systems provided access to consistent and reliable water supplies, replacing, or at least supplanting on-site farm wells. Abandoned wells are not only a problem on farmsteads. Municipalities have also hooked up to rural water systems or constructed replacement wells and may not have appropriately plugged their old wells, which gradually fall into disrepair. Surprisingly, there remain a large number of private wells in many communities, even when there is a municipal water source.

Many people have good intentions to maintain an old well as a backup or standby well, but frequently these wells are sparingly if ever, used, and ultimately fall into disrepair. Many are forgotten over time. When this occurs, the old well becomes both a potential pollution source to everyone using the aquifer and as well as a possible physical safety liability to the property owner. Whoever owns the property on which the abandoned well is located is deemed to be the well owner, even if nobody knew of its existence.

LOCATING ABANDONED WELLS

Abandoned wells may be located anywhere, but there are some obvious indicators if you look carefully. On abandoned farmsteads, the presence of former wells may be marked by relic windmills or hand pumps, or a simple pipe sticking out of the ground. Wells were often drilled near outbuildings/barns, as hauling water to the livestock was more work than hauling water to the house. Large diameter, or bored, wells may have collapsed slowly over time, leaving a circular depression, with or without some other evidence of a well. Similar evidence would apply to locating old wells on existing farmsteads now served by alternate sources.

In many parts of South Dakota, early residents tapped into flowing artesian aquifers, which provided water without the need to pump it out of the ground. However, the quality of this water was not always the best, and as higher quality sources became available, many of these wells were also abandoned. Over time, the corrosive nature of this water can eat away at the well materials, degrading if not completely destroying the original structure. Old flowing well sites are often marked by low depressions supporting aquatic vegetation, such as cattails, in areas that are otherwise dry. If remnants of the original wells remain, water may be seen spraying into the air.

SAFETY HAZARDS

Many abandoned wells are not marked or covered. In some instances, the well casing, or a pit in which the well is located, is large enough for a person or animal to fall into and become seriously injured or killed. While the existence of such a threat to physical safety might be known by property owners familiar with the lay of the land, visiting friends and family may not know places to avoid. Fortunately, these types of accidents are entirely preventable with proper plugging of the well.

PROPERTY OWNER RESPONSIBILITIES

The owner of a property on which an abandoned well is located is deemed to be the owner of the abandoned well. Consequently, the owner is also responsible for plugging the abandoned well, or wells, as required by South Dakota Codified Law (SDCL) 46-6-18 and 46-6-27. There are many reasons for the owner to properly plug an abandoned well, aside from the legal requirement to complete the plugging. These wells also pose environmental and safety hazards resulting in potential legal liabilities. A list of abandoned well hazards is as follows:

- Contamination of aquifers by allowing surface runoff carrying pollutants to enter the ground water;
- Cross-contamination of aquifers by the well passing through more than one aquifer;
- Reducing artesian head pressure which may affect other wells in the same aquifer;
- Safety hazards to people and animals.

The plugging of an abandoned well needs to meet requirements outlined in the South Dakota Well Construction Standards, which can be found in the Administrative Rules of South Dakota Sections 74:02:04:67 and 74:02:04:69. These rules specify how to plug a well depending on the type of well construction, the kind of aquifer or aquifers which the well penetrates, and the materials to be used to plug the well. Even though the owner of an abandoned well may plug the well, we strongly suggest that a South Dakota licensed well driller perform the work. In some instances, complications may arise that benefit from a little practical experience. If a well is not plugged correctly, safety and ground water contamination threats may remain, and it is much more difficult and expensive to correct the improper plugging of an abandoned well.

If you have questions or need more information, please contact the Water Rights Program at 605-773-3352. Information is also available online at: denr.sd.gov/des/wr/abandonedwell.aspx.

Acknowledgment: Most of this abandoned well information consists of excerpts from a publication (FS 891 - October 1993) entitled, "Plugging Abandoned Water Wells" prepared in cooperation with the South Dakota State University Cooperative Extension Service, East Dakota Water Development District, and the Water Rights Program of the Department of Environment and Natural Resources.

Statewide Ground Water Quality **MONITORING NETWORK**

Many public water supplies, along with thousands of private individuals, across South Dakota, draw water from wells in shallow aquifers. In most instances, there is little more than a few feet of soil separating these aquifers from the land surface. Whenever it rains, or winter snows melt, water enters and recharges these aquifers. Unfortunately, this same process can carry pollutants into the ground water, which may require treatment before distribution and use for human consumption. Public water suppliers regularly monitor the condition of the water they provide, but their focus is just on their own particular source.

But what about the rest of the shallow aquifers? To gain a better understanding of the ambient water quality in shallow aquifers, the Geological Survey Program within the South Dakota Department of Environment and Natural Resources established what is known as the Statewide Ground Water Quality Monitoring Network (Network). The Network currently consists of a total of 144 observation wells spread across 79 locations monitoring conditions in 25 separate aquifers. The statewide ground water quality monitoring effort is an endeavor to monitor sensitive aquifers in South Dakota for non-point sources of contamination and long-term trends in water quality.

Attached is a map of South Dakota on which the locations of the monitored aquifers are plotted. Note that, due to limited information in many areas, the aquifer boundaries shown on this map are very approximate and should only be used for purposes other than general discussion.

The Network was designed to examine nonpoint-source pollution and ambient ground water quality. The goal of the statewide ground water quality monitoring effort is to maintain and modify as necessary ground water quality monitoring activities that regularly and systematically assess the present water quality, impact of agricultural chemicals on ground water, and long-term trends in water quality in sensitive aquifers.

The aquifers being monitored cover much of South Dakota and are among the most likely to be impacted by human activities because of their near-surface occurrence combined with overlying land use. Emphasis is placed on monitoring for health-related aspects of water quality and monitoring for non-point sources of ground water contamination. Over the years, analytes have included pesticides, pesticide transformation products, nitrate plus nitrite as nitrogen, common inorganic constituents, volatile organic compounds, radionuclides, cyanide, and trace metals.

METHODS

Monitoring sites are located away from known point sources of pollution, such as animal feeding areas, septic tanks, and underground storage tanks. Whenever possible, monitoring sites were placed in portions of aquifers that were thick enough to allow for installation of two wells whose screened intervals do not overlap vertically. Prior water quality investigations Geological Survey Program had indicated that water quality varied vertically within shallow aquifers.

Each well in the Network has a dedicated submersible pump used for development and sampling of the well. During a sampling event, water within a monitoring well is evacuated through the pumping system. During the evacuation of wells completed in sediments that are of moderate to high hydraulic

conductivity, temperature, pH, and electrical conductivity are measured until they have stabilized. Wells are considered to have stabilized after three consecutive readings taken 5 minutes apart indicate constant temperature, pH, and electrical conductivity. After stabilization and a minimum of 3 well volumes of water have been evacuated, a sample is collected.

All wells in the statewide ground water quality monitoring network are currently subject to sampling once every other year. An attempt is made to sample each well as close to the same time each year as possible. Samples collected on a biannual basis are analyzed for pesticides and common inorganic parameters. Trace metals, radionuclides, and cyanide analyses are currently performed once every five years. Volatile organic compounds are also analyzed once every five years but in only about 25 percent of the wells in an aquifer.

RESULTS

It would be hard to summarize all of the data collected over several decades from over a hundred wells in an exhaustive monograph, let alone in a short, two-page article. Interested readers can track down specifics about a particular aquifer or well at the contacts listed below. However, a few highlights can be discussed.

METALS

Water samples are tested for a variety of metallic elements, although very few were found present over established limits, or maximum contaminant level (MCL). Selenium exceeded the MCL (50 micrograms per liter) just five (5) times, all in the Cow Creek Aquifer in southern Potter County. Elevated lead (>MCL) was detected in two separate samples from the Big Sioux Aquifer. Elevated arsenic was found in a range of aquifers across the eastern part of the state, exceeding the MCL in 46 of 410 samples tested. None of these detections have been associated with a specific human health problem.

NITRATES

Elevated nitrate concentrations are a common occurrence in shallow aquifers in South Dakota. Of the twenty (20) east river aquifers in the Network, all but five (5) had at least one sample that exceeded the MCL (10 milligrams per liter). In many instances, levels were detected well more than the MCL, although most of these samples were collected from the shallow/water table well at paired sites. In many cases, rising overall trends in nitrate concentrations have been detected in the Network.

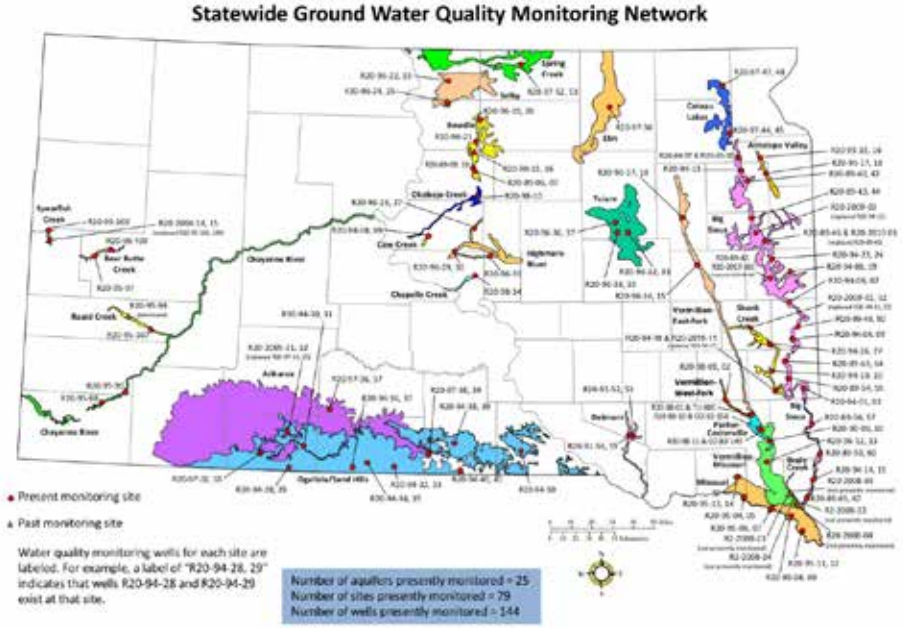
PESTICIDES

Samples have been analyzed for a wide range of pesticides, and while there are occasional detections, most are below the MCL. Atrazine and degradation product desethyl atrazine have been most frequently detected, occurring in about five percent (5%) of analyses. In most instances, detections have been reasonably transient. Re-sampling a site with a discovery most often results in a non-detect.

TO LEARN MORE:

The Geological Survey Program maintains a web page dedicated to the Network, which contains maps of the aquifers and well locations, and contact information for the lead investigator. www.sdgs.usd.edu/currentprojects/sgwqmn.aspx

Aquifers and Monitoring Sites in the Statewide Ground Water Quality Monitoring Network



BROOKINGS-DEUEL RURAL WATER SYSTEM

"Rural water is the greatest thing to come along since the rural electric and telephone." That's what one original customer of the Brookings-Deuel Rural Water System said after being hooked up to rural water in the early 1970s.

The need for a better water supply was first discussed around kitchen tables of local farmers – people working together to solve a common problem: a lack of quality water in area wells. Many wells were very high in iron (causing rust stains in laundry and sinks), manganese (causing dark stains), and nitrates from fertilizers and septic systems. It was very common on farms and in towns for people to have a cistern and pay to have water hauled in to fill them.

Brookings-Deuel started as a steering committee in 1972. In 1973, DeWild Grant Reckert and Associates (DGR) was hired as Brookings-Deuel's engineering firm, and the company still serves the system today. Brookings-Deuel RWS was incorporated in 1974, and a 16 member board was created. Today the system has a seven-member board. The original system was built in two phases – Phase I was the south end of the system, constructed in 1976, and Phase II was the north end of the system, constructed in 1977. 1978 marked the first year of full production.

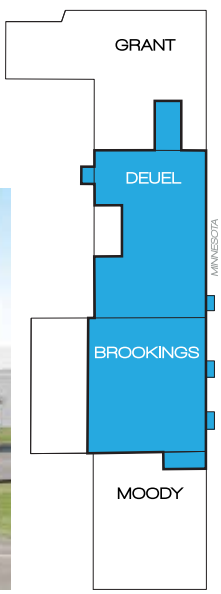
The original system consisted of about 1,000 hook-ups and 800 miles of pipeline. There was 150,000 gallons of storage. Over the years, system growth has been steady. The system now serves 2,600 customers, maintains 1,500 miles of pipeline and has 2.7 million gallons of water storage in tanks and towers throughout the system. All 13 towns located within the system's borders are now hooked up to Brookings-Deuel. Water systems were installed in Goodwin, Altamont and Labolt as part of Phase II construction, and the rest of the towns have hooked on one at a time, with Astoria being the last town to hook up in 2006. Livestock demand has always been an important part of the system. Rural water has allowed many livestock operations to grow with the access to more volume. Besides normal livestock usage, Brookings-Deuel RWS also serves eight commercial dairies and two colonies that have turkey and swine operations. With the exception of normal ongoing expansion, there were larger user expansion projects in 1982, 1984, 1992 and 2006.

Brookings-Deuel RWS has two well fields. One is the Clear Lake plant north of Clear Lake, and the other is the Joint Wellfield north of Bruce. Generally, the Clear Lake plant serves the north half of the system and the Joint Wellfield serves the south half

BROOKINGS-DEUEL RURAL WATER SYSTEM

of the system. Both plants have pressure filters for removal of iron and manganese. The Clear Lake plant's maximum capacity is 1.6 million gallons per day (MGD) and the Joint Wellfield's capacity is 3.8MGD. The Joint Wellfield is unique in the fact that Brookings-Deuel RWS owns it jointly with Kingbrook RWS. Both systems were being constructed around the same time and the partnership has been in place since day one. The Joint Wellfield is a separate entity and has its own board of directors consisting of three directors from each system. Brookings-Deuel administers the day-to-day operations at the Joint Wellfield.

BD RURAL WATER SYSTEM



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STAFF:

Gene Wilts, Manager

Lenny Faehnrich, Operator II

Jesse Christianson, Operator II

Joshua Rogness, Operator II

Lyle Skorseth, Operator II

STATISTICS:

Hookups: 2,550

Miles of Pipeline: 1,500

Water Source: Wells

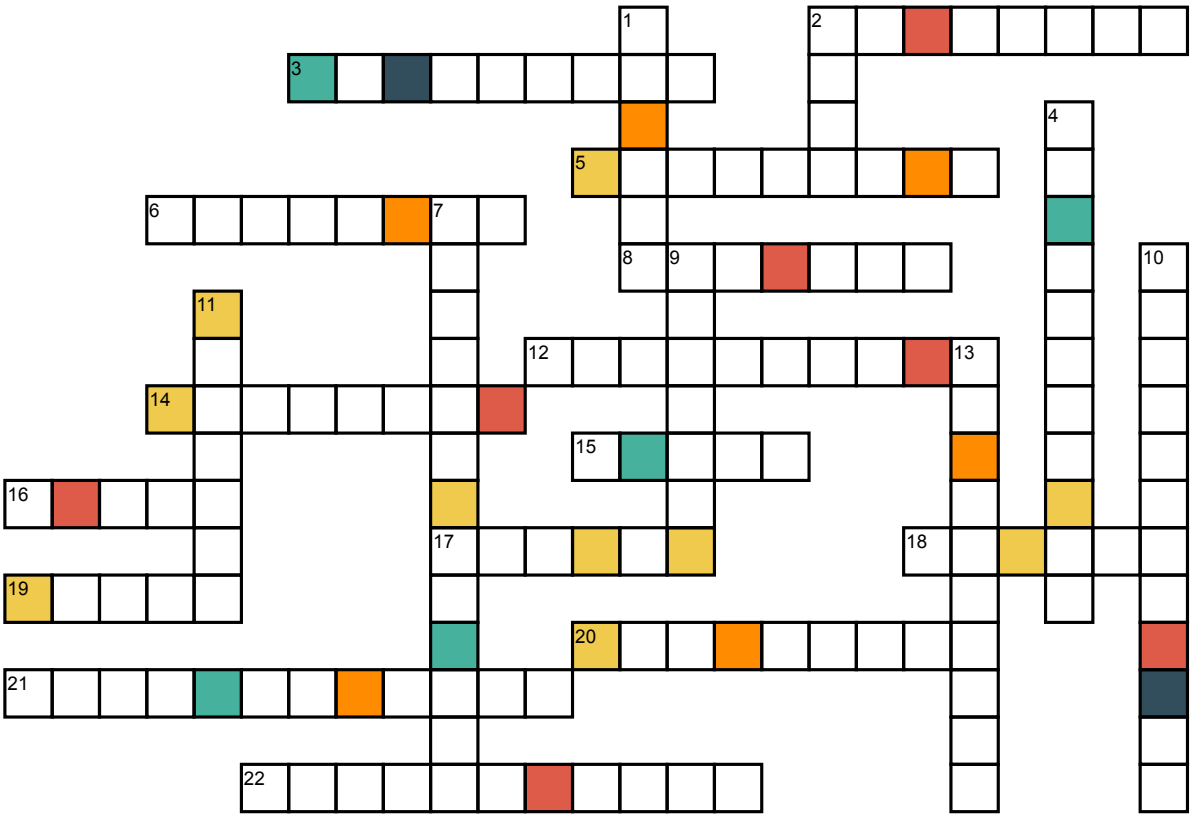
Counties Served: Brookings, Deuel, and portions of Grant, Moody, and Lincoln (MN)

Towns Served Individual: Revillo, Brandt, Astoria, Toronto, LaBolt, Bruce, Goodwin, Altamont, Bushnell

Towns Served Bulk: White, Elkton, Gary, Clear Lake

RURAL WATER CROSSWORD & WORD SCRAMBLE CONTEST

Earth's Fresh Water



WORD BANK

- ☐ brackish
- ☐ condensation
- ☐ confluence
- ☐ divide
- ☐ estuary
- ☐ evaporation
- ☐ floods
- ☐ ground water
- ☐ hydrologic
- ☐ limnology
- ☐ marshes
- ☐ mouth
- ☐ permeability
- ☐ ponds
- ☐ porosity
- ☐ reservoir
- ☐ rivers
- ☐ streams
- ☐ sublimate
- ☐ swamp
- ☐ well
- ☐ wetlands
- ☐ transpiration

ACROSS

2. Lands that are wet for significant periods of time
3. A storage location for water such as an ocean, glacier, pond
5. The study of bodies of fresh water and the organisms that live there
6. Amount of space between grains
8. Where the stream meets the ocean or lake
12. The cycle of water movement around Earth's surface
14. Water that has more salt than fresh water but less than sea water
15. A wetland with lush trees and vines found in a low-laying area beside slow-moving rivers
16. Point at which a stream comes into a large body of water
17. The largest types of streams
18. Usually occurs when precipitation falls more quickly than water can be absorbed into the ground or carried away by rivers or streams
19. Small bodies of fresh water that usually have no outlet
20. Solid changing directly into gas
21. Ability of water to flow through the pores
22. The largest reservoir of liquid fresh water on Earth

DOWN

1. A topographically high area that separates different water basins
2. Created by digging or drilling to reach groundwater
4. Change from a liquid to a gas
7. Process in which plants release large amounts of water into the air.
9. Bodies of water that have a current and are in constant motion
10. Change from a gas into a liquid
11. Shallow wetlands around lakes, streams, or the ocean where grasses and reeds are common
13. Where two streams come together

SCRAMBLE ANSWER

RULES: Use the colored squares in the puzzle to solve the word scramble above. Call your Rural Water System (See page 2 for contact information) or **enter online at www.sdarws.com/crossword.html** with the correct phrase by July 13th, 2018 to be entered into the $100 drawing.

Only one entry allowed per address/household. You must be a member of a participating rural water system to be eligible for the prize. Your information will only be used to notify the winner, and will not be shared or sold.

Congratulations to Neal McIntyre who had the correct phrase of "ONLY FOOLS RUSH IN" for April 2018.

SDARWS HIRES NEW EXECUTIVE DIRECTOR

KURT PFEIFLE
SDARWS Executive Director

The Board of Directors for the South Dakota Association of Rural Water Systems welcomes Kurt Pfeifle as its new Executive Director. He replaces Dennis Davis who retired this past April after 39 years with the Association.

Pfeifle comes to the Association with 31 years of water management experience. He was the manager of the West-River Lyman/Jones Rural Water System from 1986 to 1991, after which he managed the Mid-Dakota Rural Water System for the past 25 years.

"Kurt's background and familiarity with the key functions of the SDARWS mission will have an immediate impact on the service we provide to all of the rural water users in South Dakota, said Ron Gillen, SDARWS Board Chairman. "I look forward to helping him as we keep moving forward. He truly is an asset we should build on."

After attending business school for one year at National College of Business, Pfeifle received his degree from Mitchell Technical Institute. Throughout his tenure, he has been a member of the South Dakota National Guard (13 years), Murdo City Council, and Miller School Board. Pfeifle was appointed and served five years on the Board of Commissioners for the South Dakota Housing Development Authority, and served on the South Dakota One Call Board as a representative for rural water systems.

The South Dakota Association of Rural Water Systems is a membership organization headquartered in Madison, SD with a satellite office in Spearfish. For over 40 years, SDARWS has been well-respected for the high-quality training, services, publications and advocacy they provide their water and wastewater members in South Dakota. The association employs 12 individuals and trains hundreds of individuals in all aspects of water and wastewater management through workshops, training classes, and conferences. SDARWS also produce the consumer magazine, *Quality on Tap!* which is a cooperative effort between 17 rural water systems and the Association and reaches over 38,000 rural water households throughout the state. They also support research programs like the Regional Water Research Consortium and the Water & Environmental Engineering Research Center and are committed to the long-term sustainability of rural water systems. They have also lobbied successfully against sales taxes on water and other pertinent issues while also supporting issues that are important to rural water systems such as the railroad bill, battling the Corps of Engineers over water rights, and supporting continued funding of the state Water Omnibus bill.

FROM THE EXECUTIVE DIRECTOR

Kurt Pfeifle, Executive Director
South Dakota Association of Rural Water Systems

I'd like to formally introduce myself to everyone as the new Executive Director of South Dakota Rural Water. Some of you may know me as the manager of the Mid-Dakota Rural Water System where I have spent the last 25 years. As a member system of SDARWS, I had a 10,000-foot view of the work the Association provides to their members, and now I get to experience the other side.

This transition has been bittersweet after 25 years working for Mid-Dakota. I've been a witness to every piece of pipe going into the ground; all brick and mortar as it was constructed; and I've personally hired every employee working there. I've been blessed to have worked with a great Board of Directors at Mid-Dakota. To say letting go is difficult would be a huge understatement. I get emotional thinking about all the friends and relationships, including directors and staff that I'll no longer interact with on a daily basis. It's truly an odd mix of excitement and elation along with sadness and melancholy that I am experiencing as I make this transition.

I've got just a few weeks of work under my belt getting to know the SDARWS staff, and have been busy familiarizing myself with the inner workings and services provided by the Association. I've also had a chance to get on the road and visit some of our member systems and look forward to getting around to more of them as time goes on.

If you would like to contact me, please feel free to call the Madison office at 605-556-7219, or shoot me an email at kpfeifle@sdarws.com.

First staff meeting with new Executive Director. seated around the table starting on the left: Steve Attema, Mike Moeller, Jennifer Bame, Robyn Brothers, Kurt Pfeifle, Jim Zeck, Brant Ager, Greg Gross, Jeff Fossum, Bill Thorson, Nick Jackson. Not pictured: Jeremiah Corbin.

REGISTER TODAY!

SDARWS 32ND ANNUAL RURAL WATER OPEN

JULY 17, 2018
Elmwood Golf Course
SIOUX FALLS, SD

Registration includes: 18 holes of golf, riding cart, luncheon & prizes!

REGISTER ONLINE AT SDARWS.COM

or: tinyurl.com/SDARWSGOLF

9:00 Shotgun Start (Must register at course by 8:30 am)

TEE BOX SPONSORSHIPS TO BENEFIT RURAL WATER CENTER

Tee Box Sponsorships come in 3 levels - Gold ($500), Silver ($250), and Bronze ($100). All proceeds from Tee Box Sponsorships benefit the Rural Water Center and are TAX DEDUCTIBLE! Sponsorship includes signage at Tee Box, and recognition on electronic signage at registration and during luncheon/awards. This sponsorship can be reserved at the online golf registration page, or by emailing golf@sdarws.com

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WATER MATTERS

Nitrates in Well Water (part 1)

Nitrate is a common contaminant found in many wells in South Dakota. Too much nitrate in drinking water can cause serious health problems for young infants. This article is the first of a series of reports on nitrates in well water, intended to provide a basic explanation of nitrate in wells and give steps that well owners can take to protect your family and visitors from illness.

WHAT IS NITRATE?

Nitrate (NO_3) is a naturally occurring chemical made of nitrogen and oxygen. Nitrate is found in air, soil, water, and plants. Much of the nitrate in our environment comes from decomposition of plants and animal wastes. People also add nitrate to the environment in the form of fertilizers.

HOW DOES NITRATE GET INTO WELL WATER?

Natural levels of nitrate in South Dakota ground water are usually quite low (less than 1 milligram per liter [mg/L] of nitrate-nitrogen). However, where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the ground water. Nitrate is highly soluble (it dissolves readily in water), so it tends to move with water flowing through the ground.

Wells most vulnerable to nitrate contamination include wells in shallow aquifers, dug wells with a casing which is not watertight, and wells with damaged, leaking casing or fittings. Presence of nitrate contamination of a well is often regarded as the first sign of deteriorating ground water quality.

HOW MUCH NITRATE IS TOO MUCH?

The federal drinking water standard for nitrate is 10 mg/L of nitrate-nitrogen, which provides newborns with reasonable protection against blue baby syndrome. This level is mandatory for all public water systems and strongly recommended for private wells.

HOW DO I KNOW IF MY WELL WATER HAS NITRATE?

Nitrate is tasteless, odorless, and colorless. To find out if there is nitrate in your water, have it tested by a qualified laboratory. Sampling material can be obtained from the South Dakota Department of Health at the following website: https://doh.sd.gov/lab/environmental/privatew.aspx

HOW OFTEN SHOULD I HAVE MY WELL TESTED FOR NITRATE?

If you have a non-public water supply, it's a good idea to have a routine nitrate test every two or three years, more frequently if nitrate has been detected in the previous sampling. State regulations require well drillers or owners to have a water sample tested for nitrate (and other things) when they construct a new well. After that, owners of private wells must arrange for their own water testing. You should also have your water tested for nitrate if you are a woman planning on becoming pregnant or if infants will be using the water.

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