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2019 SPRING–SUMMER EDITION

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Front Page...40 Years and Counting!

For the past 40 years, MRWS has been offering technical assistance and training to certified operators, water boards, utilities management and clerks around the state. Over the past several months, our organization has been much like that cloud on the cover—rising above the mountains of possible roadblocks and reaching for and embracing the future. We're proud to have been part of the process that keeps water and wastewater systems running smoothly and we intend to continue nurturing that relationship into the future. Resiliency, effective management, and infrastructure are now no longer part of the future but elements that have to be contended with today. As utilities around the state step into the future, MRWS will be right by their sides, helping them overcome the mountains of difficulties and turn them into clouds of possibilities!

Cover photo: MT Hwy 12 near Avon. Photo taken by Julie Allen

National Director's Report—Jim Magone

Hello Montana Rural Water members! I hope everyone made it through the winter and you are ready for the spring and summer months. I was not re-elected to the board at the 2019 Delegate Assembly meeting held in February. I would like to take this time to say thank you for allowing me to serve on the MRWS Board and as the National Director. My term will end in September at the WaterPro Conference in Nashville TN.

Montana Rural Water Systems is a fine organization and it just proves that when people work together, we can make things happen. We have gone through several changes in the past year and I think we are moving forward in a positive direction. MRWS has a great staff and over the years, they have been easy to work with.

Thank you again and if I can be of any assistance to you, just let me know.

About this Newsletter

Montana H2O-NEWS-4-You is the official publication of Montana Rural Water Systems, Inc. It is published 2 times per year for distribution to representatives of rural and municipal water and wastewater systems. Articles, news items, and photographs are welcome. Submit to MRWS at 525 Central Ave M6, Great Falls, MT 59401. Statements of fact or opinion are the responsibility of the author and do not necessarily reflect the opinion of Montana Rural Water Systems, Inc. All rights reserved. This is a non-profit bulk mailing permit at Great Falls, MT.

Compilation, Editing, & Layout completed by Julie Allen & Staff.



From Julie Allen's Desk

MRWS Training Specialist

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What We've Done and Where We're Going

The 2019 MRWS training year has hit the ground running and we've packed in 20 workshops and two certification exam reviews since Christmas! Training happened from Sidney to Superior with various stops in between so far this year. If you haven't seen us yet, why not? There will be more training opportunities this fall so we're sure to see you along the way!! We're halfway through the current CEC period, so you should check your CECs and start planning to get them finished up by the end of May, 2020!

We had two Sustainable Utility Management workshops and it was obvious that small systems are concerned about things such as Customer Satisfaction, Financial Viability, Infrastructure Stability, and Water Resource Adequacy. We discovered that resources and public understanding of utility management seem to be top on the list of needs for systems. Without support from their customers, utilities often face huge problems that are difficult to overcome when it comes to keeping their infrastructures in good working order.

I was thrilled to get to experience two hands on drill and tap workshop in January with our Mueller friends. It's amazing to watch and proof once again at the skills our operators must have to do their jobs well! With growing communities, our small system operators are realizing that they need to learn skills such as drilling and tapping in order to keep their systems working efficiently.

Change has been part of our lives at MRWS and they've all been good changes! We've moved our Annual Conference from February to March (March 25-27, 2020) and we've moved our office. Stop in and see us at 525 Central Ave in the Times Square building downtown. We're all sporting new email addresses, too! Much easier to remember—our first name initial and our last name @mrws.org.

Don't forget that we have all kinds of useful links on our website: <http://mrws.org/>. Do you know how to look up your monitoring schedule online? Need an application to become a certified operator? Want to know what National Rural Water is up to? Need some information from EPA or USDA? Use the links on our website--- they're easy to find and easy to use!!

What's Coming Up?

September 17th	Rate Structure, Record Keeping, and Emergency Response	Nine Pipes
September 19th	Leak Detection, Water Audits, and Water Loss	Kalispell
September 24th September 26th	To Repair or Replace: Aging Infrastructure and Corrosion	Missoula Butte
October 3rd	CEC Fair	Malta
October 15th thru October 17th	14th Annual National Park Service & Small System Utility Operator Training	W. Yellowstone



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Dates / Times and Reporting Activities Not to Forget



Trying to keep straight all the deadlines and reporting requirements for our Water and Wastewater Systems has become a full time Job. To try and make this a little easier “Your Friends” at MRWS have developed this handout to try and summarize some of the most commonly required **Dates / Times and Reporting Activity Requirements for Your Utility!** “While every effort was made to ensure that the information listed is accurate, this is an unofficial document, provided only as aid to help water systems better understand their sampling / monitoring requirements. Please contact MRWS if you find any mistakes in this document.”

Water

Total Coliform Monthly Samples:

- ✓ Monthly Coliform Samples are to be collected based upon your Systems population.
 - These samples must be submitted to the lab no more than **30 hours** from when the sample was collected until it was analyzed by the laboratory.
 - Most systems have their laboratory submit the results of these samples. However, it is the Systems responsibility to verify that the lab will submit the results.
 - These monthly samples are collected at Identified Routine Sample Sites from your “Sample Site Plan”. The number of sites is dependent upon your number of service connections!
 - Sample sites must be rotated until all designated routine sample sites have been sampled; before a site is used again.
 - Results must be reported to **DEQ by the 10th of the month** following the end of the period.
 - DEQ must be notified within **24-hours** of any positive sample results.
 - System must also submit copies of all Public Notices to DEQ within **10 Days** of issuance.

Chlorine Residual Reporting Form for GROUNDWATER Public Water Systems:

(Community / Non-Transient Non-Community or Transient Non-Community)

- ✓ Must be submitted by the **10th of the following Month**.

(Monthly) DBP Disinfection By-Products Rule & Maximum Residual Disinfection Limit (MRDL) Chlorine Residual Measurements Reporting Form:

- ✓ Quarter 1 - 10th of April
- ✓ Quarter 2 - 10th of July
- ✓ Quarter 3 - 10th of October
- ✓ Quarter 4 - 10th of January

(Quarterly) DBP Disinfection By-Products Rule MRDL Chlorine Residual Measurements Reporting Form:

- ✓ Quarter 1 – 10th of April
- ✓ Quarter 2 – 10th of July
- ✓ Quarter 3 – 10th of October
- ✓ Quarter 4 – 10th of January

Types of and Timelines for Public Notice:

- ✓ Tier 1 (Immediate Notice, Within 24 Hours)
- ✓ Tier 2 (Notice as Soon as Possible, Within 30 Days)
- ✓ Tier 3 (Annual Notice)

Continued on next page

Dates / Times and Reporting Activities Not to Forget



Water / continued

Consumer Confidence Report:

- ✓ Water Utilities providing water to Consecutive Water Systems are required to provide CCR information to these Consecutive Systems by **March 30**.
- ✓ Mail or otherwise directly deliver a copy of your CCR Report to your Water System Customers by **June 30** of each year and keep a copy for your Records.
- ✓ Mail or Email a copy of your CCR Report to DEQ by **June 30**.
- ✓ Complete and submit the CCR Certification Form to DEQ by **September 30**. DEQ recommends you send both the Form and the CCR report at the same time.

Lead and Copper Monitoring Results:

- ✓ Lead & Copper Certification Form must be completed and mailed into DEQ **within 3 months** following the end of your current Monitoring Period.
 - To include a **completed copy** of the notification results (use DEQ Template Letter).
- ✓ Utility must also provide the specific test result for each sample site customer **within 30 days of receiving the test results** from the laboratory.

Recordkeeping for Public Water Systems: *(Complied from MT DEQ Drinking Water Regulations Summary for Community and Non-Transient Non-Community Water Systems / Revised June 2016)*

Records	Timeframe
<ul style="list-style-type: none"> ➤ Corrective Action for Violations ➤ Public Notices ➤ Consumer Confidence Reports (Community systems Only) 	At least 3 Years
<ul style="list-style-type: none"> ➤ Microbiological Analyses ➤ Turbidity Analyses ➤ Variances or Exceptions 	At least 5 Years
<ul style="list-style-type: none"> ➤ Chemical Analyses ➤ Sanitary Surveys and Written Reports ➤ Stage 1 and Stage 2 Monitoring Plans 	At least 10 Years
<ul style="list-style-type: none"> ➤ Records of all Lead and Copper results, WQP results, Source Water Sampling results, Corrosion Control recommendations and studies, Public Education Materials, State Determinations, Schedules, Letters and Evaluations 	At least 12 Years

Sanitary Surveys conducted on a Periodic Basis for Each Public Water System:

- ✓ Community Water Systems are visited every **3 Years**.
- ✓ Non-Community Systems are visited every **5 Years**.
 - Every Survey consists of an On-site Review of the following Eight Key Elements:
 - (1) Source, (2) Treatment, (3) Distribution System,
 - (4) Finished Water Storage, (5) Pumps, Pump Facilities, Pump Controls
 - (6) Monitoring, Reporting and Data Verification
 - (7) System Management and Operation
 - (8) Operator Compliance with State Requirements

Continued on next page

Dates / Times and Reporting Activities Not to Forget



Water / continued

Sanitary Surveys continued:

- Any “Significant Deficiency” identified during the Survey must be corrected or the system must have a State-Approved Plan for correction, **within 120 days of being notified of the deficiency**.

Operator Certification for Water or Wastewater Timeframes:

- ✓ All Operators must renew their Certification annually (**by June 30**) for the following **Fiscal Year (July 1 – June 30)**.
- ✓ Renewals include Fee Payment **Annually** and proof of completion of the appropriate Continuing Education Credits (CEC) requirements **every two years (on even numbered years)**.

Wastewater

Wastewater Noncompliance Reporting Form:

- ✓ This form is intended to fulfill the requirement for written submission of information related to any noncompliance which may endanger Health or the Environment, in accordance with the **(24) Twenty-four Hour** Reporting requirement of your systems MPDES permit.
 - This form must be Completed and Certified too by your “**Principal Executive Officer or ranking Elected Official**”.

Sanitary Sewer Overflow (SSO) Event Form:

- ✓ This SSO report form is to be used by municipalities that have experienced an SSO. SSOs are **discharges of wastewater** (including that combined with rainfall induced infiltration/inflow) from a separate **sanitary sewer prior to treatment at the wastewater treatment plant**.
- ✓ This includes: SSOs typically release untreated sewage into **basements** or out of manholes and onto **city streets, playgrounds, and into streams**.
 - The submittal of this form will fulfill the **Five-Day Written Report** requirement for your permit and Administrative Rules of Montana (ARM) 17.30.1342(12)(f)(i) provided:
 - the form is completely filled out, and
 - the form is received by the Department within **5 days** of the **24-hour oral report**.

When to Apply for a New Wastewater Discharge Permit:

- ✓ It is all WW Utilities responsibility to apply for a **new 5-Year Wastewater Discharge Permit** in advance of your permit expiring. This must be done no later than **180 days prior to the expiration date of your current permit!**

Monthly MPDES Reporting on Wastewater Discharges:

- ✓ All electronic reporting and submission of discharge permit parameters must be submitted to on a monthly basis and/or postmarked no later than the **28th day of the month** following the completed reporting period.





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**FROM THE DESK OF JOHN W. CAMDEN,
MRWS EXECUTIVE DIRECTOR**

2019 started out with a record setting number of days of below freezing temperatures in February and with that, came a record number of service lines and mains that froze, keeping utility crews busy. The weather did break a little during the Annual Conference which allowed participants to attend another successful session.

Jim Magone, Montana Rural Water Systems (MRWS) National Director was not re-elected to the MRWS Board at the 2019 Delegate Assembly meeting. Jim will serve out the remainder of his term which will be the last day of the WaterPro Conference in Nashville TN, September 2019. We have been very fortunate to have Jim serve as our National Director. Jim worked on three NRWA committees and was an advocate for rural water. I would like to thank to Jim for his many years of service to MRWS...THANKS!

Our three new directors are Kevin Durocher (Region 4), Tim Rauser (Region 6), and Bud Gillin (Region 8). Kevin and Tim were re-elected and will serve another 3-year term. Bud is from Polson MT and this is his first term as a director for MRWS. Bud brings a wealth of knowledge to the Board. He has been the Water/Sewer Operations Manager of the Salish Kootenai Housing Authority (SKHA) since February 2013. Prior to that he was the Maintenance Manager for SKHA. Both positions required him to deal with water and sewer problems. As the Maintenance Manager he provided maintenance to 440 low rent units. He often had to deal with service line issues in addition to septic problems. As the Water/Sewer Operations manager the past six years, he administers the day to day activities of 30 systems; 19 of those are regulated by EPA. In 2017, SKHA was recognized as the "System of the Year" for their outstanding operation of systems throughout EPA Region 8. His success in operating such a high number of systems requires his team to be on top of their operating procedures. Bud's experience will greatly assist the MRWS Board...Welcome Bud!

We've had some staff changes and additions to MRWS. First, Tanya Shadrick was hired as the MRWS Office Manager. Tanya is no stranger to MRWS, having worked in the office part-time and provided valuable service at the Annual Conference. Second, Rory Schmidt has moved over to the DNRC Technical Assistance and Training position. Third, Erin Wall was hired 11/1/2018 to fill the second Source Water Protection position. Erin is from Athens, Georgia and has worked for the MSU/Bozeman Extension office, helping with source water management. Fourth, Bobbie Shular was hired 12/1/2018. She was the General Man-

ager of Homestead Acres Water District (North of Great Falls) and was hired to fill the third Circuit Rider position for MRWS. Bobbie has experience in Water District management and assisting with day to day operations. Fifth, Earl "Bill" Bahr came out of retirement and was hired for the second Wastewater Technician position. Bill has over 40 years of experience in plant operations, EPA/State regulations, and providing training and technical assistance to wastewater systems. Please welcome our new members of the MRWS family!!!

MRWS is in the process of making some changes which include upgrading our "Office 365 Outlook" program to provide mass emails to our membership, associate membership, clerks, and operators throughout Montana.

MRWS has partnered with NRWA in their Products and Services Portfolio. Systems can choose from website design and customer communications, to several insurance packages including health plans, data breach services, line and leak coverage, background screening as well as the Rural Water Loan Program. Currently several contracts are being negotiated. Stay tuned for more...

MRWS is also looking at providing a small publication booklet that lists members, associate members, and legislative contact information. During the months of May and June, MRWS will be conducting a membership drive. Currently there are approximately 650 water systems that are not MRWS members. We're hoping for a good response.

If you didn't already know, MRWS has moved the office to the Time Square Building – located at 525 Central Ave M6, Great Falls MT. June 21, 2019 we invite you to attend an open house scheduled for 1:30 to 3:00pm to show off the new office.



FLOW MEANS EVERYTHING

By Roger Skogen, Wastewater Technician

When it comes to wastewater many variables point towards proper treatment. This includes choice or style of treatment. For example, if flows in your community are .03 MGD you most likely can perform all the treatment necessary with a simple lagoon system. If your flows are larger, for example 3 MGD, you will most likely need to look at some sort of wastewater treatment system, such as an activated sludge process available in many styles of wastewater treatment facilities.

The main point of this is in order to achieve the optimum treatment, you need to know wastewater flows coming from the community. This information is vital in not only determining what style of treatment, but also the size of the treatment facility required.

Flows can be monitored through staff gauges, physical measurements, flow meters, or a combination of these. The most reliable is a flow meter that will record flows on a continuous basis. This will provide you with invaluable information over a period of days, months, or even years to assist you in determining areas of need with your wastewater treatment system. Besides helping to determine size of facility, or style of treatment facility there are other benefits from having a flow meter. Most individual discharge permits require a flow meter at the influent and at the effluent of a wastewater facility. Effluent flows are required information on the DMR's if you discharge and you need flow records from specific sample days to calculate loading rates.

Wastewater discharge permit applications require Inflow and Infiltration studies be performed to determine the need for collection system improvements and solve percent removal issues for wastewater. The famous saying with DEQ and EPA is "DILUTION IS NOT THE SOLUTION TO POLLUTION". Also, to make your wastewater system run as efficiently as possible, you do not want to treat clear water. There is no nutrient value to clear water, so the wastewater bugs necessary for treatment are not able to thrive and complete the task at hand when clear water is abundant in your system. When you monitor flows continuously, you are better able to determine the affects of possible Inflow and Infiltration, and if it is an issue with your wastewater system.

If you are trying to calculate detention times, disinfection dosage rates; or capacity available for holding wastewater until you are able to batch discharge, irrigate, or even for total retention/evaporation; it helps to know the flow history; and also; the current flows going through a facility. The best way to achieve this is the use of a flow meter.

As you can see; in the big picture of wastewater; knowing flows empowers the operator to make informed decisions towards the best management practices for his or her system. Better management means operating more efficiently, and this means more savings to Cities, Towns, and Districts that own and operate these wastewater facilities.

If possible, I would encourage all systems to install flow meters to better manage their facility. If you are doing upgrades to your current system, or installing a completely new form of treatment system, make it part of the upgrades or project to install flow meters. Remember that this is your system. In order to operate correctly, you as the operator need all the information you can get to make vital decisions concerning operation and maintenance.

If you would like to discuss flow monitoring at any time, please feel free to contact me:

- Roger Skogen, MRWS Wastewater Technician
- rskogen@mrws.org
- 406-788-2089

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Department of Natural Resources and Conservation Newsletter for Montana Rural Water Spring 2019

The Department of Natural Resources and Conservation (DNRC) has had a busy winter. The lawmakers at the 2019 Legislative Session were at work here in Helena. They introduced a mountain of bills. In fact, 3,300 bills were drafted. Of these, 780 became bills in the House and 360 became bills in the Senate. Probably not all will make it to the Governor for signature. There are Infrastructure bills to help communities with water and wastewater systems projects. House Bills 6, 11 and 652 have passed and House Bill 8 is in the process. Be sure to research these bills and see what the final versions look like and what funds will go to communities for infrastructure projects. The DNRC also has been approved by the Legislature to continue its support for Montana Rural Water (MRW). The partnership between the DNRC and MRW is important to the State of Montana.

Revolving Fund Loan Program

The large amount of snow we had this winter meant a pretty slow construction period for the December 2018 to March 2019 period. We have a number of projects bidding this spring. Communities will be ready to move into construction as soon as the snow melts and it dries out. We are still seeing a number of wastewater treatment plants that need work or complete rehabilitation. Cut Bank, Livingston and Polson are examples of communities taking on these projects and those projects will be complete this summer.

The average cost was over \$17 million for each of these. Coming this construction season or next depending on funding, are wastewater plants at Whitefish, Big Sky and Four Corners.

There are a number of Drinking Water systems doing work on pipe and plants. Those include Glendive, Denton and Emerald Heights Water District by Kalispell.



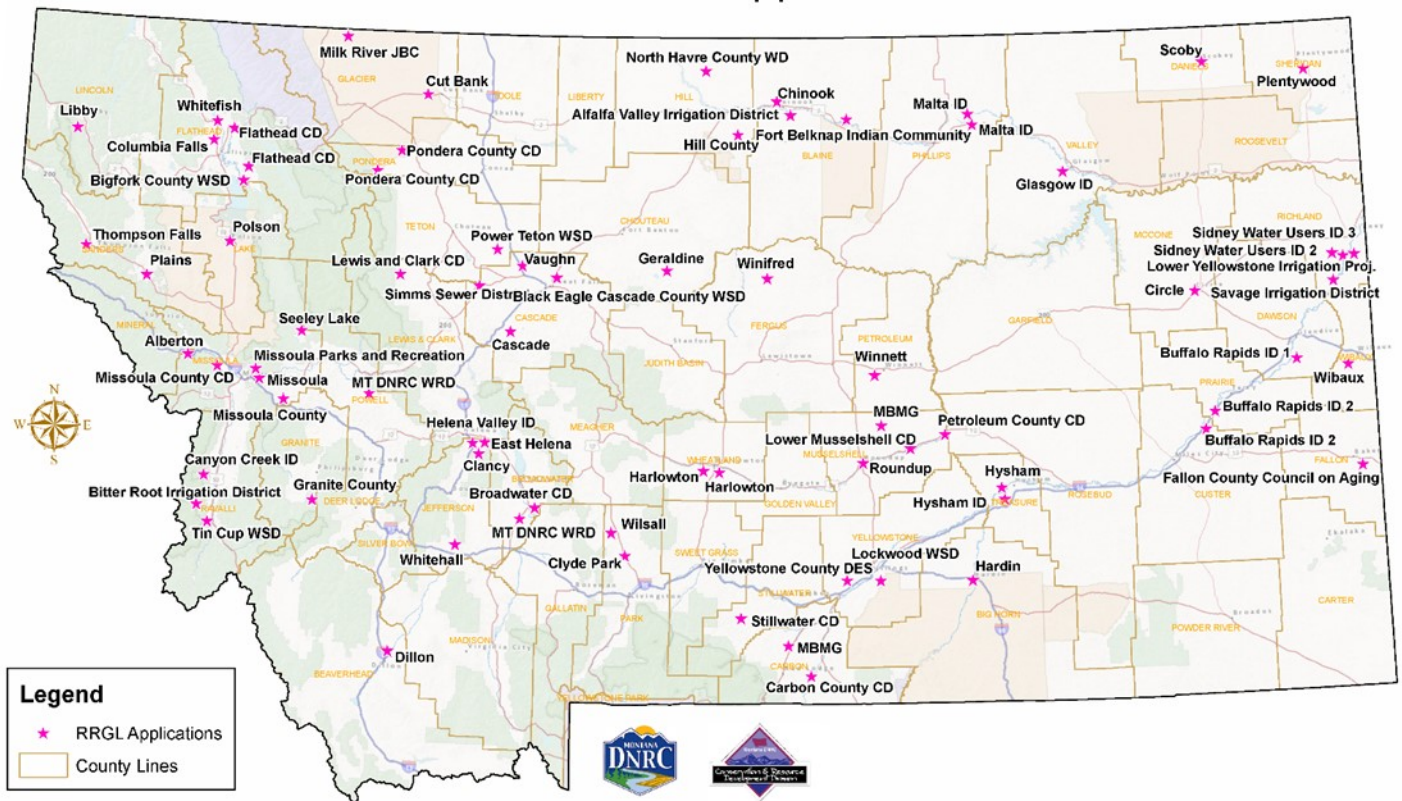
-Polson Wastewater Project, June 2018

Renewable Resource Grant and Loan Program

The Department of Natural Resources and Conservation (DNRC) has been working on projects and applications. The Renewable Resource Grant and Loan (RRGL) Program and the Reclamation Development Grant (RDG) program have applications awaiting legislative approval. House Bills 6 and 7 are requesting \$6,687,000 and bonding is proposed to fund \$3,550,000 for our programs. Funding for our programs will be determined by May 1, 2019.

Continued on next page

The RRGL program project grants are limited to \$125,000 per project and fund projects that conserve, manage, develop or preserve Montana's renewable resources. Seventy-six applications from around the state were received on May 15, 2018. The water and wastewater systems accounted for half of the applications. Project applications come from all parts of the state and represent highly diverse projects.



The RRGL planning grant program also funds planning grants to help communities and public entities plan for larger projects and develop the RRGL project applications. DNRC awarded sixty-four planning grants to date. \$800,000 in total will be awarded to planning grants by June 30, 2019.

Other grant programs have also worked across the state to benefit resources for Montanans this biennium and will start up new funding cycles July 1, 2019.

Our programs include:

- \$800,000 for Planning Grants
- \$300,000 for Irrigation Development Grants
- \$300,000 for Watershed Management Grants
- \$100,000 for Emergency Grants
- \$75,000 for Private Grants

-Billings Water Tank Project, 2018



The arrival of Spring often comes with flooding and other resource emergencies to communities in Montana. DNRC is here to help! Please contact us to see how we can provide technical or financial assistance. A list of the available grants and program information can be found on the DNRC webpage <http://dnrc.mt.gov/divisions/cardd>.

It's never too early to start planning for your projects! The next funding cycle for the planning grant programs will begin July 1, 2019. RRGL and RDG project applications will be accepted May 15, 2021.

Continued on next page

Regional Water Program

DRY PRAIRIE – Dry Prairie will build service mains to Flaxville and Scobey. More Federal funding made it possible to advertise for bids on both portions as one segment, known as the Scobey-Flaxville Mainline Project. Dry Prairie awarded the contract on February 25th, with work scheduled to begin by May 2019. Construction of the main from Plentywood east to Westby is now scheduled for 2020. **FORT PECK TRIBES** – Construction of pre-oxidation and pre-sedimentation basins/structures at the regional water treatment plant (WTP) progressed through the fall. The contractor achieved Substantial Completion prior to winter shutdown. Branch line installation work includes areas west of the Poplar River all the way to Porcupine Creek, and up to the northern boundary of the Reservation. There are at least four phases of branch line construction taking place. Construction completion on the R-Y Road north-south transmission main is anticipated in the first half of the 2019 season.

NORTH CENTRAL MONTANA AUTHORITY – The Shelby North project segment, with interim service water from Shelby’s wellfield, would supply Oilmont CWD and the new Nine Mile CWD by autumn 2020. Approximately 20 miles of water main were installed during the late summer and fall of 2018; an early May remobilization is anticipated.

The standpipe, booster pump station (BPS) and metering stations construction is also scheduled to begin work May 2019. Approval by Montana DEQ on the water main project was granted, conditioned on needed upgrades to the Shelby wellfield. Advertisement for bids on those upgrades will be summer of 2019.

CHIPPEWA-CREE TRIBE – The Tribe has sought Federal funding in a lump sum to build the first phase of the WTP, with initial capacity of up to 11 MGD. The North Central Authority voted to contribute its \$9.45 million share for Federal FY 2019 to WTP construction. Current plans are to construct the 11 MGD capacity in two phases. There is currently intent to advertise for bids on the first phase in mid-to-late summer of 2019.


DRY-REDWATER – Construction on the Authority’s most recent waterline and BPS project, Sidney Circle, began in July and progressed through the fall of 2018. The project segment has achieved Substantial Completion. When the contractor remobilizes in the spring of 2019, work remaining essentially consists of punch-list items. This project added about 54 users to the Authority’s customer base. Plans for how the Authority will approach the design and construction of its next project segment are currently under consideration.

CENTRAL MONTANA – (Musselshell-Judith Basin project) - Phase 1 construction planning and engineering, to bring Madison aquifer water from the Ubet area wellfield to Harlowton, is proceeding while the Authority monitors progress with its project authorizing legislation in the U.S. Congress. The pipeline and appurtenances are currently under design, such that the project could be “shovel ready” upon receipt of Congress’ approval of the system. Plans for drilling a second production well at the wellfield are currently under development, with funding possible early in State Fiscal Year 2020.

The Clean Water for Rural Communities Act, to authorize the Central Montana and Dry-Redwater projects, sponsored by Senator Daines and co-sponsored by Senator Tester has already been re-introduced in the 116th Congress.

If you have questions, call (406) 444-6668.

Anna Miller – Revolving Fund Loans
Rick Duncan - Regional Water
Lindsay Volpe – Renewable Resource Grant (RRG) Program



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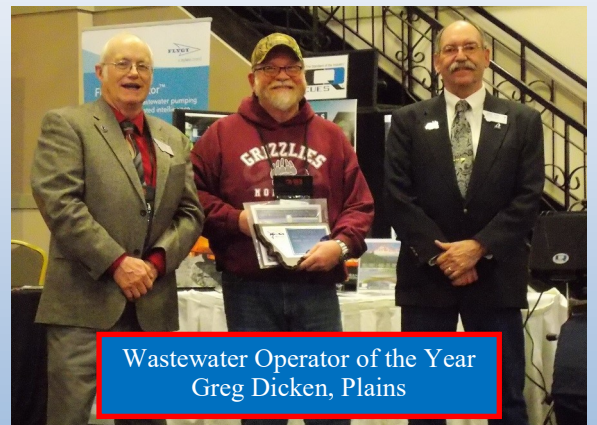
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Fire Hydrant O & M and Line Flushing

By Nick Clos, Circuit Rider

Fire hydrants are installed in the distribution system for fire protection and are a very important tool to the local fire department. Hydrants are the #1 way to flush your distribution system, but like any other piece of equipment, if you don't operate and maintain your fire hydrants properly, they won't work when you need them most. Fire hydrants should be inspected at least once a year and line flushing should be done at least once a year, preferably twice a year. Fire hydrant O & M and distribution line flushing go hand in hand.

Site Inspection: Make sure the hydrant and street valve are free of debris and easy to get to. Remove any obstacles that interfere with access to the hydrant or valve (bushes, trees, fencing, rocks, dirt, etc.) There should be a minimum of 3 feet of clear area around every hydrant. Replace any missing caps. If any hydrants are low because of landscaping or other reasons a height extension kit will be needed.

Leak Detection: Using leak detection equipment, geophone or even a stethoscope, listen to the hydrant for a leak in the hydrant itself, or the distribution pipes in the surrounding area.

Check Lubricants: Depending on the make and manufacturer some hydrants require a non-petroleum food grade lubricant in the top to work properly. Check the manufacturer literature for the proper type and amount. Clean and lubricate threads and chain race around the cap with a food grade anti-seize grease.

Fire Hydrant Operation: Remember to always use the proper hydrant wrenches to operate the hydrant. Under normal conditions, the water in your distribution system moves fairly slow and is at a constant pressure. Opening a hydrant too quickly could create negative pressure and set up a dangerous backflow situation. Closing a hydrant too quickly or cars and trucks driving over a charged hose can cause water hammer, also called hydraulic transients or pressure surges which are very destructive to water lines, equipment, P.R.Vs., and indoor plumbing connections. Dry-barrel hydrants should always be opened fully because the drain mechanism operates with the main valve. A partially opened hydrant can cause water to be forced out through the drains and cause erosion around the base of the hydrant. Remember to clean out the valve box and exercise the street valve. Electric or hydraulic valve exercisers work very well.

Checking O-rings and Seals: Open hydrant fully. All caps must be tight at this point, check for any leaks around the operating stem, nozzles, any seals or packing, and at the flanges. Replace the O-rings if necessary.

Hydrant Draining: Putting the caps on too soon can trap water in the barrel and set up the possibility of freezing. Because hydrants need a supply of air to drain properly, a good way to check the drain is to place your hand over an open nozzle and check for a vacuum. Never put the caps on tight until the hydrant is drained completely. If the hydrant is not draining properly, open the hydrant a few turns to allow the air to vent, and then tighten the caps and open the hydrant valve about 5 turns and let the pressure build up for a few seconds under pressure, this should flush out the drain holes. This may solve the problem. If you want to check hydrants later for draining, use a 10ft. section of plastic tubing inserted into the hydrant and blow in the tube to check for water standing in the barrel. If you hear bubbles the hydrant is not draining properly.

Out of Service: If you find a fire hydrant that has major problems and will not work properly mark it with "Out of Service" marker or bag and notify the fire department immediately, and make arrangements with your utility supplier for the parts and proper tools for the repairs.

Flushing Distribution Lines: Flushing the distribution system pipelines is done to remove sediment and impurities such as rust and mineral deposits that build up over time and accumulate on the walls of the pipe. A buildup of bacteria known as "biofilm" can also coat the pipes inner surface. This combination of sediment and bacteria can restrict water flow in the pipes and may cause corrosion. Flushing uses water velocity to scour out the materials that accumulate in the distribution system. Flushing should be done a minimum of once a year, some systems twice a year, dead end lines could require more. Flushing should be conducted during periods of low water demand (spring or fall).

Before flushing the system make sure you have an adequate amount of water available. Notify all customers who will be affected of the times and dates of the flushing through the billing system, door hangers, local radio, newspaper or local TV. Make sure that hospitals, retirement homes, breweries, restaurants and other commercial businesses that may be affected by the main flushing are notified. Make sure you have the right equipment for directing the water from pedestrians, traffic, private lots etc. Hydrant Diffusers work very well for this and also to avoid erosion damage to lawns, yards and streets. Always use the proper hydrant wrench. If you are discharging water to state waters you may need dechlorinating equipment for the hydrant. If you have any questions or doubts about dechlorinating contact the Montana Dept. of Environmental Quality.

Continued on next page

The water system personnel should start at the water supply and work out into the distribution system. This procedure is known as unidirectional flushing, which is superior to traditional flushing techniques because it allows crews to direct the flow creating more efficient scouring and using less water. Always remember to open hydrants all the way. A minimum of flushing velocity of 2.5 ft/sec. should be used; 5.0 ft/sec. is preferred. Each hydrant can take up to 30 minutes or more to get clean. Make sure that the surrounding area pressures do not drop below 20 psi. The crew should also collect and record the flow rate, pressure, color, odor and any other pertinent information that you feel will help maintain the quality and quantity of your water system.

This is also an excellent time to check and maybe lower your I.S.O. Classification.

I.S.O. The Insurance Services Office, Inc. (ISO) is a leading source of information about risk for the property & casualty insurance industry. Its products help customers measure, manage and reduce risk. ISO is used by insurance companies in most states to evaluate fire departments for the purpose of establishing insurance premiums in the local areas. In states using ISO; Fire Alarm, Fire Department, and Water Supply are measured in the Fire Suppression Rating Schedule (FSRS). This schedule reviews the major elements of a community's fire-suppression system and develops a numerical grading called a Public Protection Classification (PPC). Within this grading there are 10 classifications. A classification of 1 is the best and a classification of 10 would be the worst (having no recognized fire protection).

ISO Classification (PPC): In obtaining an ISO Classification, the grading is broken down into three major categories. They are:

Receiving and Handling of Fire Alarms -	10 % = 10 points
Fire Department -	50 % = 50 points
Water Supply -	40 % = 40 points
	100 % = 100 points

Forty percent of the grading is based on the community's water supply. This part of the survey focuses on whether the community has sufficient water supply for fire suppression beyond maximum daily consumption. For those communities without a municipal water system sufficient for fire suppression, other alternative water supplies will be evaluated. All components of the water supply system will be reviewed to determine your ability to supply adequate quantities throughout your fire protected area. This ISO information is just the tip of the iceberg. For more information talk to your Fire Chief in your area.

Example of a notice that could be included in water bills:

ATTENTION WATER CUSTOMERS

The _____ Water Dept. will be performing fire hydrant flushing on

_____ Through _____.

The work will begin at _____ am. and continue until approximately _____ pm.

During this time, you may experience a reduction of water pressure. It is advisable to refrain from washing laundry during those days due to a possible discoloration of the water.

Please contact the office at _____ if you have any questions.



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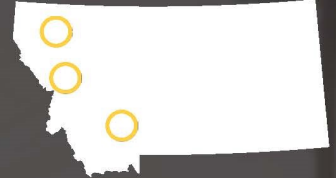
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Contingency Planning Toolbox for Source Water Protection

Kristi Kline, Source Water Protection Specialist

Contingency planning is defined as a **course of action formulated for dealing with a situation that is unexpected**. We have talked a lot about putting together a “plan” for a public water system and what this includes. Having various tools in your “Plan Toolbox” will be valuable assets to deal with the “unexpected”.

One particular tool available are the *Drinking Water Emergency Sampling (DWES) Kits*. The Montana Department of Environmental Quality (DEQ) – Public Water Supply (PWS) and the Department of Public Health and Human Services (DPHHS) - Laboratory Services Bureau have developed these kits that can be used during an emergency to sample for some unknown contaminants that may have been introduced into a drinking water system.

As Montana is a very large state, transporting samples to laboratory facilities can lengthen the time a PWS may be off-line during an emergency. The DWES kits were designed to provide quick access to sampling bottles and expediate the transport for laboratory testing. The DWES kits contain instructions, containers, and some personal protective equipment necessary to collect samples of water from a drinking water facility during a suspected or credible contamination threat event. The DWES kits are located across Montana at all county health departments, public water supplies over 3300 in population, DEQ Public Water Supply Offices, Regional Hazmat Teams, 83rd National Guard Civil Support Team, Tribal Jurisdictions as well as at the DPHHS State Laboratory.

Some important points to remember:

- The kits are not intended to be used to sample for anything other than water borne contaminants.
- If the sampling kit is used, **consultation with the DPHHS lab is required** in order to coordinate transportation, arrange any special handling requirements, alert any necessary medical surveillance groups and coordinate potential state laboratory network actions
 - **1-800-821-7284** (24/7 Main Laboratory)
- The outside envelope shows what contents are inside the kits – **Do Not Unseal the Kit** unless intending to use it for an emergency

As the DWES kits were distributed in 2010, a couple of “what ifs” to consider:

- Outside Tamper Tape has been compromised:
 - Kits may need to be inspected to ensure integrity
 - If the contents can be verified as tamper free (sterile, etc.) kits may be able to be resealed - **consultation with the DPHHS** is required
- Sample bottles do not contain preservatives (to extend the life of the DWES kit)
 - The bottles can't be used for regular compliance sampling – No reason to open the cooler to “borrow” a sample bottle

Contingency planning shouldn't occur in a bubble – A valuable element to this process involves collaborative planning with a number of cooperative partners. An important partner in designing your Contingency Plan would be the County Health Department staff, as they have a connected partnership with the DWES kits. For further information on the DWES kits, contact MRWS or these agency contacts:

Kirk Yoder
DEQ Public Water Supply
Security and Emergency Preparedness Coordinator
406-444-7494
kyoder@mt.gov

Joel Felix
DPHHS State Environmental Lab
Chemical Terrorism Laboratory Coordinator
406 -444-9653
jfelix@mt.gov



Kristi Kline and operators at a Sampling & Monitoring Workshop in Big Timber.

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(List of new operators in Montana)

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Glenn Bies	2A	Spencer Stone	3B,3C	Robert DePaso	4AB
Ryan Ries	3A	Erick Pidgeon	3E	Courtney Greyn	2D
Tyler Oehmcke	4AB	Kevin Ore	2A,3B	Gabriel Strangeowl	4AB
Brian Webb	4D	Shane Pursley	2A,3B	Shannon Burdick	2E
David Ghekiere	3C	Bert Elwood	1B	Clarence McKeehan	3B
Daniel Calcaterra	3C	Josh McCraw	3C	Gorm Scarpholt	3A,3B
Duncan Quigley	3A,3B	Richard Murnion	4AB	Raymond Emeline	1B
Richard Hader	4AB	Atanacio Loya	3A,3B	Wayne DeWit	3B
Dean Allen	4AB	Joseph Rappleyea	1C	Nicole Scoville	4AB
Carl Failing	1B	Timothy Carse	3C	Jonathan Spotted Eagle	4AB
Levon Carey	4AB	Gavin Ingraham	4AB		
2019 MRWS Annual Conference					
Brandon Parker	1C	Jene Rust, Jr.	1C	Shawn Solomon	1B
David Ghekiere	1B	Jesse Rohlf	3A,3B	Sky Marie McCoy	4AB
Landon Holte	1B	Hayden George	2A,3B	Lance Oesau	4AB
Jacob Gregory	3A	Nicholas Dale	3A,3B	Glen Clements	1C
Anthony Hebert	3A	Richard Wipf	4AB	William Henne	4AB
Vincent Burley	1B	Jake Porter	2A,3B	Mark Repnak	4AB
Jacob Peila	4AB				
2019 Billings Spring School					
Scott Kopetzky	3C	Kurtis Hillier	3A,3B	Josh McCraw	3B
Dominic Patrick	1C	Russell Smith	1C	Donald Osgood	3C
Robert Trimble	4AB	Justin McGauley	3A	Thomas Nevin	3A,3B
2019 Kalispell Spring School					
Eric Day Rider	4AB	Eric Bucher	3C	Darwin Leighty	3C
Jerry Williams	3A	Ridgley Wieringa	2B	Amy Gray	3A,3B
Atanacio Loya	3C	Timothy Guinn	1A,3B	Logan Morrow	3B
Andrew Cadman	3A,3B	Fred Heitman	4AB	Austin Olsen	3B

Continued on next page

Certification Corner Cont.—Kalispell Water School Cont.

Michael Hayes	4AB	Todd Funke	4AB	David Starkel	4AB
Kenneth Davis	3A	Joseph Bressler	1C	Matthew Lussier	4AB
Jeff Stern	4AB	Sean Cox	4AB		
In-Office Exams October 2018 – March 2019					
Sean Boelman	4AB	Toby Wetsch	4AB	Clarence McKeehan	3A
Douglas Baldwin	3B	Cory Wilhelm	2A	Matthew Finley	1C
Robert Lewis	4AB	Richard Campbell	3A,3B	Gregory Evison	3B
Colton Weskamp	2A	Adam Pummill	4AB	Clifford Olsen	1C
Gary Schwarz	4AB	Erik Dion	4AB	John Helton	2B
Nathan Bell	3A	Adam Pummill	3E	Eric Easley	2A,3B
Robert Habets	1C	Matthew Valett	4AB	Nicholas Palicz	3E
David Hadcock	1B	Carmel Johnston	2B	Wayne DeWit	2A
Benjamin Johnson	3B	Mike Hofer	3C	Sarah Kuhn	3B
Philip Gietzen	4AB	Blaise Stepansky	4AB	Jacob Carey	1B,1A

A = WATER DISTRIBUTION B = WATER TREATMENT C = WASTEWATER SYSTEMS
 D = INDUSTRIAL WASTEWATER E = ON-SITE WASTEWATER
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Information provided by Jen VandenBos – DEQ/PWS Certification Program

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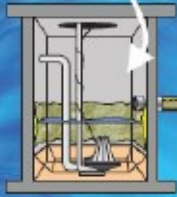
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RISK AND RESILIENCE ASSESSMENTS AND EMERGENCY RESPONSE PLANS:



NEW REQUIREMENTS FOR DRINKING WATER UTILITIES

Section 2013 of America's Water Infrastructure Act of 2018 (AWIA) requires community water systems¹ that serve more than 3,300 people to complete a risk and resilience assessment and develop an emergency response plan.

RISK AND RESILIENCE ASSESSMENT

Your utility must conduct a risk and resilience assessment and submit certification of its completion to the U.S. EPA by the following dates:

EMERGENCY RESPONSE PLAN

Your utility must develop or update an emergency response plan and certify completion to the U.S. EPA **no later than six months** after risk and resilience assessment certification. Each utility deadline is unique; however, the dates below are the due dates for utilities who submit a risk and resilience assessment certification by the final due date according to the population served.

Important Dates

- March 31, 2020 if serving $\geq 100,000$ people.
- December 31, 2020 if serving 50,000 to 99,999 people.
- June 30, 2021 if serving 3,301 to 49,999 people.

- September 30, 2020 if serving $\geq 100,000$ people.
- June 30, 2021 if serving 50,000 to 99,999 people.
- December 30, 2021 if serving 3,301 to 49,999 people.

Recertification

Every five years, your utility must review the risk and resilience assessment and submit a recertification to the U.S. EPA that the assessment has been reviewed and, if necessary, revised.

Within six months of submitting the recertification for the risk and resilience assessment, your utility must certify it has reviewed and, if necessary, revised, its emergency response plan.

Visit the U.S. EPA website to find more information on guidance for developing a risk and resilience assessment at <https://www.epa.gov/waterriskassessment/conduct-drinking-water-or-wastewater-utility-risk-assessment>.

Visit the U.S. EPA website for guidance on developing an Emergency Response Plan at <https://www.epa.gov/waterutilityresponse/develop-or-update-drinking-water-or-wastewater-utility-emergency-response-plan>.

TOOLS OR METHODS

AWIA does not require the use of any standards, methods or tools for the risk and resilience assessment or emergency response plan. Your utility is responsible for ensuring that the risk and resilience assessment and emergency response plan address all the criteria in AWIA Section 2013(a) and (b), respectively. The U.S. EPA recommends the use of standards, including AWWA J100-10 Risk and Resilience Management of Water and Wastewater Systems, along with tools from the U.S. EPA and other organizations, to facilitate sound risk and resilience assessments and emergency response plans.

¹ Section 2013 of AWIA applies to community water systems. Community water systems are drinking water utilities that consistently serve at least 25 people or 15 service connections year-round.

Still have questions about the new AWIA requirements?
Contact the U.S. Environmental Protection Agency (U.S. EPA) at dwresilience@epa.gov.

Office of Water (4608T)
EPA-817-F-19-004
May 2019

FREQUENTLY ASKED QUESTIONS



I need more information about risk and resilience assessments and emergency response plans:

Risk and resilience assessments evaluate the vulnerabilities, threats and consequences from potential hazards.

What does a risk and resilience assessment include?

- Natural hazards and malevolent acts (i.e., all hazards).
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution, and electronic, computer and other automated systems).
- Monitoring practices.
- Financial systems (e.g., billing systems).
- Chemical storage and handling.
- Operation and maintenance.

Who should I work with when creating my emergency response plan?

- Utilities must coordinate the risk and resilience assessments, as well as the emergency response plans with local emergency planning committees.

For more information, see www.congress.gov/bill/115th-congress/senate-bill.

What does an emergency response plan include?

- Strategies and resources to improve resilience, including physical security and cybersecurity.
- Plans and procedures for responding to a natural hazard or malevolent act that threatens safe drinking water.
- Actions and equipment to lessen the impact of a malevolent act or natural hazard, including alternative water sources, relocating intakes and flood protection barriers.
- Strategies to detect malevolent acts or natural hazards that threaten the system.

I need more information on the certification process:

What do I need to submit to the U.S. EPA?

- Each utility must submit a certification of your risk and resilience assessment and emergency response plan. Each submission must include: utility name, date and a statement that the utility has completed, reviewed or revised the assessment. The U.S. EPA has developed an optional certification template that can be used for email or mail certification. The optional certification form will be available in August 2019.

Who can certify my risk and resilience assessment and emergency response plan?

- Risk and resilience assessments and emergency response plans can be self-certified by the utility.

How do I submit my certification?

- Three options will be provided for submittal: regular mail, email and a user-friendly secure online portal. The online submission portal will provide drinking water systems with a receipt of submittal. The U.S. EPA recommends using this method. The certification system will be available in August 2019.

When can I submit the initial certification?

- Utilities should wait to submit the initial certification to the U.S. EPA until the U.S. EPA publishes *Baseline Information on Malevolent Acts Relevant to Community Water Systems*, which is required under AWIA by August 2019.

Do I need to submit my certification to my state or local government?

- No. Section 2013 of AWIA does not require utilities to submit the certification to state or local governments.

How long do I need to keep a copy of my risk and resilience assessment and emergency response plan?

- Utilities need to keep a copy of both documents for five years after certification.

What if I do not have a copy of my most recent risk and resilience assessment?

- The U.S. EPA intends to destroy vulnerability assessments (VAs) submitted in response to the Bioterrorism Act of 2002, but if utilities would like to have their VA and certification documents mailed to them, contact WSD-Outreach@epa.gov, and on utility letterhead, include the utility name, PWSID, address and point of contact as an attachment to the email.

RESOURCES & TOOLS

Conducting a Risk and Resilience Assessment

- The U.S. EPA's Risk and Resilience Baseline Threat Document (available August 2019).
- The U.S. EPA's [Vulnerability Self-Assessment](#).

The U.S. EPA Website

- <https://www.epa.gov/waterresilience/americas-water-infrastructure-act-2018-risk-assessments-and-emergency-response-plans>.

Developing an Emergency Response Plan

- [Emergency Response Plan Guidance](#).
- The U.S. EPA's [Emergency Response Webpage](#).
- [Local Emergency Planning Committees](#).

Still have questions about the new AWIA requirements?
Contact the U.S. Environmental Protection Agency (U.S. EPA) at dwresilience@epa.gov.

Office of Water (4608T)
EPA-817-F-19-004
May 2019

A New Face in Source Water Protection

by Erin Wall, Source Water Protection Specialist

Hello! My name is Erin Wall, and I am the new Source Water Protection Specialist with MRWS. I first moved to Montana from Georgia in 2013 after earning a B.S. in Environmental Chemistry for an Americorps program conducting education and outreach for a conservation district. I fell in love with Montana, and once my term ended, I decided to stay. At the end of 2016 I made the difficult decision to move back to Georgia and started missing Montana the second I crossed the Wyoming state line. I am beyond happy to be back in Montana and proud to call Helena home (yes, even after the record low temps this winter!)



My experience ranges from conducting stream & site assessments, lab analysis, surface water & groundwater monitoring, developing guidance documents, private well education, and implementing trainings. This diversity in experience allows me to develop plans that are specifically tailored to your system and community.

Since joining the MRWS team in November, I have hit the ground running and completed Source Water Protection Plans for two systems. I believe that collaboration with local stakeholders such as conservation districts, watershed groups, and county extension agents in addition to municipal, county, and state government entities are key to developing a holistic approach to protecting the source water. Resources are tight – time, money, capacity, and sanity are limited, and as they say, many hands make for light work. Collaboration lets the work diffuse among everyone involved so different strengths are utilized. After all, it is significantly easier to plan and try to prevent a problem from occurring than addressing an incident when it happens.

If Rory started a plan with you last year, you can expect to hear from me! Feel free to contact me with any questions or concerns you may have. I am looking forward to meeting you all!

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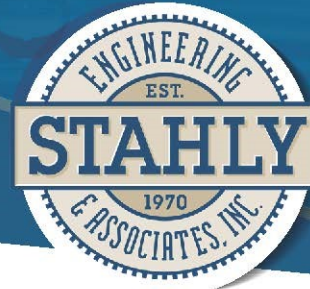
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40th Annual Conference



From the desk of the Board President, Al Kelm

At the time I was writing this article the nights are still getting below freezing and there is always a threat of snow. I am tired of Winter and want change, warmer weather, clear skies and be able to go outside without wearing a coat. I have to be patient as I know that change will come as the year progresses.

Here at Montana Rural Water Systems there have been changes in the last year and more to come. As our Annual Conference Theme stated "Setting our sights on the Next 40 Years" we will have to change with the times in order to be a viable organization, meet your needs as water/wastewater professionals, and meet those changes.

Here are a few of the changes that were implemented by MRWS this year:

- * We have changed the date of our Annual Conference to the last week of March hoping to keep from traveling to or from the conference in a snow storm, on bad roads, and more availability of rooms, not competing with the State Basketball playoffs.
- * We have a new Executive Director, John Camden who has been with MRWS for a number of years, and a new office Manager, Tanya Shadrack who also worked part time for MRWS and is helping keep things moving along smoothly in the office.
- * We have a new member to the Board of Directors who was elected by the Delegates at the Delegate Assembly Meeting during the Annual Conference and it is Mr. Lytle "Bud" Gillin from Polson.
- * There have been changes in the program staff as Rory Schmidt is now the DNRC Training Specialist and Technical Assistance, Erin Wall is the new Source Water Specialist, Bobbie Shular is the new Water Circuit Rider and William "Bill" Bahr is the new Wastewater Technician.
- * MRWS is adding to our organization a few services from the Affinity Programs offered by National Rural Water. We have selected the RuralWaterImpact. This is an easy-to-use website for your community that will also Send text alerts, post forms and CCR'S, easy to update, Bill pay information, mobile friendly and unlimited support. We also support the Servline Program. This program is designed exclusively for water systems and will cover water loss at a local utility level without a deductible.
- * MRWS has moved their office to a downtown Great Falls location to 525 Central Ave M6. With this move we have gone to a different server for ease of e-mails. We also hope to have everyone be able to use their credit card for Conference Registration and Vender Registration. We have a new web page. Please send us your tweets, photos and Facebook updates and we will try to get them on our website. Check us out!

I don't want to go into too much detail about some of the programs as the office can give more information than I could include in this article.

These are a few of the changes that MRWS has endured over the last year. These changes are like the weather that I am waiting for, it takes time for them to mature and be implemented and sometimes can be a painful process and waiting period, but they are worth it. These changes are important to making sure that we set our sights on the next 40 years and be the strongest organization that we can be for our membership and provide the services that are needed from the MRWS Organization. If you have any questions about any of the Affinity Programs offered, or anything else, please feel free to contact our office at (406) 454-1151.

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Community Resiliency

By Dan Kramer, Circuit Rider, dkramer@mrws.org, 406-253-1710

Prevent, Deter, Protect, Respond And that is to: *Recognize, Avoid, Isolate, Negate or Notify (RAIN)*

These are the National Response Protocols that are achieved through training and planning

Community resiliency assessment is based on information Training conducted with local Sheriff, Police, LEPC and Community gatherings. It is my belief that unless each community takes the plans or EOP and determine what resources they have and what *personnel or knowledge based individuals that have the skill sets to work outside the box, all plans will fail unless the knowledge base is found, and resources identified.* The key is to *identify those individuals* and what areas of *expertise they have. It does not matter what area of responsibility.*

I hear the talk but there is no walk. Below is the beginning of the walk.

Welders, fabricators, chemist, food naturalists, engineers, information resources (hard copy), farmers, doctors, medical supplies, natural remedies with (hard copy information) when man made drugs runs out.

I. Identify the areas of responsibilities. Who and what personnel that can do the following?

A. Water- can it be run manually?

- i. Ground water- hand pumps and windmills or water wheels?
 - a Can they be built or fabricated, plans how to build?
- ii. Artesian wells that require no pumping.
 - b Where are they?
- iii. Surface water- can it be run manually?
 - a Chemicals to treat and how much on hand. What other sources can be used to accomplish the same treatment. Chemists- who are they?
 - b Spare parts to fix worn parts. Can they be fabricated or made?
 - c Filters and how long do they last (Spares)
 - d How are you going to pump the water? With What?

B. Wastewater- Can it be run manually?

- i. Chemicals to treat and how much on hand. What other sources can be used to accomplish the same treatment. Chemists- who are they?
- ii. Spare parts to fix worn parts. Can they be fabricated or made?
- iii. Filters and how long do they last (Spares)?
- iv. How are you going to pump the wastewater? With What?

C. Power- How to make some.

- i. Water power?
 - a Stream, river, or paddle wheel. Who can build them?
- ii. Steam - Is there a steam engine not in use that can be used? Who can run it?
- iii. Bio fuel Steam - What sources? Who will make the fuel? Who knows how? Gasifiers plans? Hard copy resources?
- iv. Generators
 - a Parts - fabrication can they be made? What raw materials on hand and who knows how?
 - b Fuel - Can you make fuel (stills) or grow the fuel. Gasifiers burn wood? How- plans and who knows how?
 - c Relocate or remove generator and attached to natural resource.
 - i. Wind mill plans?
 - ii. Steam bio fuel plans?
 - iii. Water plans?
- v. Geo Thermo available and where?

D. Food stores and what processes required to make food?

- a Flour mills, where are they? Who knows how to use them?
- b Processes to grow, save and store food. References on how to? Who knows how?
- c Hydroponics plans - hard copy resources and materials?
- d Perma-culture plans - hard copy resources and materials? Heirloom seeds stores and where?
- e Food stores- cellars, grain bins? Rail cars what is on board. Identify where and who knows?
- f Calculate food needed for population base? 2.2 lbs. to 3 Lbs. a day?

E. Mechanical resources

- i. Water power—Water wheels, Water generators
- ii. Solar
 - a Sun
 - b Dish or troth focal point heat source? Plans and hard copy resources? Who knows How?
 - c Solar furnace - Plans and hard copy resources? Who knows How?
 - d Solar panels?
- iii. Steam
 - a Fuel
 - b Equipment that still works
 - c Chemical reaction to make fuel? Who Knows and How?

F. Communications: who, where, what, and how resources will be;

- a The use?
- b Procedures for use?
- c Plans and hard copy resources and materials for parts and fabrication and repair?
- d Parts?
- e. Energy to keep operational?

Continued on next page

G. Security - who, where, what, and how resources will be;

- i. Protected who has the skills? Who and what safe areas are identified for key personal and general population?
- ii. How to be protected?
- iii. What are the priorities?
- iv. Define area of protection?
- v. Procedures for security to be implemented?
- vi. What is to be used to protect the area and what resources?
- vii. Scale of protection to be used?

Fear is the destroyer of all things if you allow it. It is conquered by facing that fear by education and training. With education and training fear has no place because I know how to prevent, respond, deter and protect my Homeland, my Family, and my Community because we work together to be Resilient.

In future articles I can expand on the information in this article. Please email if you wish me to or not. Some people wish to ignore this or just give up. I am a fighter and I choose to learn and train to be an asset to my Community and I hope you choose to be one as well. There is nothing wrong about being a warrior to protect your family, friends and community. I have done presentations on this subject for systems and public gatherings.

The walk begins and fear ends by Education and Training.

THE DAILY CHECK-UP FOR YOUR HEALTH--- YOUR GROUNDWATER SYSTEM HEALTH THAT IS

By Bobbie Shular, Circuit Rider

As the almost newest kid on the block, I have to say I enjoy meeting the operators in the systems I have visited. I have had several operators offer me a tour of their system and I always say yes as I am almost guaranteed a new tool in my tool box of knowledge. With that said, I am going to share a couple of the tools I came to this job with for checking groundwater system health in just a couple of minutes a day. This check-up can be broken into three parts: well pump health, well health, and distribution health.

Many systems have SCADA or telemetry that automatically track all the information a system needs to evaluate their system health but many small systems are not in the position to install SCADA or telemetry and need a quick, inexpensive way to evaluate how their system is doing.

Lets start with well and pump health. Installing an hour run meter can help track how many hours a day your well and pump are working. Knowing how many hours a day is normal for your well is your first indication of a problem when the hours a day change. Did the hours per day change because the system entered irrigation season? Did the hours per day change on a day or in a season that is atypical? Hours per day can be converted into gallons per minute (gpm) when the system also knows how many gallons per day (gpd) were pumped. When the system knows what the average gpd are for a well and records the gpm every day a pattern for that well emerges. Is it normal for that well to drop in gpm the longer it pumps? Is the well showing a slow steady decline in gpm? If the well is showing a slow steady decline in gpm this could indicate a perforation in your well pipe. If a perforation in the well pipe is the cause; this knowledge allows the operator to be proactive in scheduling a repair outside of days or seasons that are typical high use periods for the system. To determine if it is the pump, using an ohm meter at the fuse box should give an indication if the pump needs repaired or replaced before it fails; again, allowing the operator to be proactive in when to schedule a repair.

Moving on to distribution health. Installing a flow meter at the well and consistently recording and adding how many gallons each well pumps a day helps the operator recognize what is normal for that system. When the operator notes a change in how many gpd are pumped they can usually tell if individual customers have a problem with a leaking service line or if a main has developed a leak. This last winter was brutal in its temperatures and multiple systems were reporting frozen service lines between the curb stop and water main. Small systems would see a decrease in the gallons per day pumped until the lines thawed. At which point, many of those same systems saw their gpd surge as those line thawed. When I operated my own system, I liked to calculate my gpm and gpd first thing in the morning as that was my first heads up that my system had a problem. This allowed me to adjust my work schedule that day to allow time to respond to a call from a customer for a broken line and/or give my repair crew a heads up that a leak would need repaired once found.

The ability to track gpd and gpm every day grants the operator the ability to be proactive in the maintenance of their system. The ability to be proactive translates into less money spent on costly repairs for system failures, helps the operator head off a series of cascading problems for the system due to water outages and decreases the amount of time customers are on restricted water use or suffering thru a water outage. This simple daily check also helps the system board plan for future improvement projects or new wells if it is determined that a new well is needed.

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