

Master Well Owner Network

A program of the Penn State College of Agricultural Sciences and Cooperative Extension



PennState

Summer 2021

Groundwater Quality Study in Six PA Counties Completed

Penn State Extension and MWON recently completed work on a project funded by the Rural Community Assistance Partnership (RCAP) and the U.S. EPA that tested private water supplies in six counties. Of the 241 water supplies tested, 83% were drilled wells, 3% were hand-dug wells, 1% were cisterns, and 13% were springs.

Most of the 241 water supplies failed to meet drinking water standards with 72% failing at least one aesthetic standard and 48% failing at least one health-based standard. The various test parameters and the percent of water supplies failing their respective standards included:

- Coliform bacteria 41%
- *E. coli* bacteria 14%
- Arsenic 2%
- Barium 0.6%
- Nitrate-Nitrogen 5%
- Copper 13% for first draw sample, 0% for running water
- Lead 5% for first draw sample, 0% for running water
- pH 15%
- Total dissolved solids 6%
- Corrosivity 69%

One interesting result from the study was that both lead and copper were common in first-draw samples but not present in running water samples. This confirmed that corrosion of metal plumbing was the source of 100% of the copper and lead results that exceeded the drinking water standards.

A follow-up evaluation was emailed to all 241 households in May 2021 (5 to 21 months after the water testing occurred in each county) to determine if water supply owners had acted to better manage their drinking water. The 90 households that responded provided the following results:

- 62% acted to improve their drinking water by moving polluting activities, installing water treatment, installing a sanitary well cap, shock disinfecting their water, or re-directing surface water contamination away from their well or spring.
- 59% did additional research on their water supply including obtaining a copy of their well completion report or visiting the Extension drinking water website.
- 47% educated others by talking with neighbors, family, friends, or co-workers about what they learned during this program.
- 49% saved money (beyond the free water test) by avoiding un-necessary water treatment equipment, avoiding medical costs from health-related pollutants, or by learning about the most efficient treatment system for their water supply.

Thanks to all MWON volunteers and Extension staff who helped with this project. A similar RCAP-funded project will start this fall in Indiana, Huntingdon, and Mercer counties.

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What is the Master Well Owner Network?

The Penn State Master Well Owner Network (MWON) is a program dedicated to educating PA residents about the proper construction and management of private water systems.

The goal of this program is to educate private water system owners and promote better management of private wells, springs, and cisterns throughout the state.

MWON Sponsors

This project is made possible in part by the Penn State Extension, the Pennsylvania Department of Environmental Protection and the Pennsylvania Ground Water Association.

More Information:

<http://extension.psu.edu/water/mwon>

Upcoming DOH Water Testing Projects

Penn State Extension is continuing to offer a free water testing program for a limited number of households in select counties in 2021. The overall project will test over 600 private wells and springs in 18 Pennsylvania counties. This no-cost testing is limited to one test per home for approximately 33 households per county. Each home must also be a primary residence or rental; seasonal homes and camps are not eligible for this testing. The testing has a value of approximately \$100 from one of three state accredited water testing labs and includes coliform bacteria, *E. coli* bacteria, nitrate, manganese, arsenic, lead and copper. Interested homeowners must pre-register and agree to attend a mandatory 1-hour webinar where basic information on the testing process will be provided. Dates and times for the mandatory one hour webinars for each county program coming next month are listed below:

- Potter County—July 12, 12:00 PM
- Bedford County—July 12, 12:00 PM
- Erie County—July 19, 12:00 PM

Homeowners or renters with a private well or spring in the above counties can find a registration site for each county listed at <https://extension.psu.edu/private-water-supply-events>.

Once registrants attend the mandatory webinar, they will either be mailed a water test kit with a pre-paid return mailer or they will receive instructions on how to pick up and drop-off a kit at a designated location in their county. Water test results are sent to participants within 1-2 weeks along with information on how to interpret the results. Optional follow-up webinars will be offered every few weeks to allow participants to ask questions about their results. If you know anyone who might be interested in this testing, please share the registration information. Additional no-cost testing will be available in more counties coming in 2022!

Recorded MWON Webinar Provides Details on Hard Water

MWON recently provided the 24th advanced topic webinar for volunteers on Tuesday, April 13th on **Causes and Treatment of Hard Water**. The webinar discussed the causes of hard water including calcium, magnesium and iron and how hardness is tested and reported by labs. Various treatment options were also explained such as traditional salt-based water softeners along with emerging, chemical-free softening technologies.

Thanks to all of the MWON volunteers who tuned in for the live version of this webinar! If you were unable to attend, you can access the recording of this webinar, along with recordings of the other 23 advanced topic webinars, on the MWON website at: <https://extension.psu.edu/programs/mwon/information/webinars>.

Using the Penn State Water Testing Lab

Nearly 2,000 private water supply owners get their water tested by the Penn State Agricultural Analytical Services Laboratory each year. The lab strives to ensure accurate and easy-to-understand results to water well and spring owners. A survey of water testing customers last year found that 98% felt they received their test results in a timely manner, 93% thought the water test report was easy to understand, and 99% rated their overall experience as “good” or “very good”.

Numerous drinking water testing packages are available ranging in cost from \$50 to nearly \$200 along with many individual water test parameters that can be tested for a lower cost (ex. coliform bacteria and *E. coli* bacteria costs \$35). It is recommended to get water samples to the lab as quickly as possible after they are collected. If samples cannot be directly dropped off at the lab, overnight shipping is suggested to ensure accurate test results. To learn more about the Penn State drinking water testing program visit <https://agsci.psu.edu/aasl/water-testing/drinking-water-testing>.

Lab customers often have questions about how to collect and submit samples to the lab. Penn State Extension created a 10 -minute video that describes all aspects of using the Penn State lab testing kits at: <https://extension.psu.edu/how-to-use-the-penn-state-drinking-water-test-kit>

Want More Water News from Penn State Extension?

In addition to education on private drinking water supplies, Penn State Extension provides applied research and education on many water-related topics including stormwater, pond/lake management, agricultural water issues (riparian buffers, nutrient management, etc.), watershed restoration processes, and wastewater management.

The Penn State Water Resources Extension team summarizes new resources, educational offerings, and accomplishments in their popular **Watershed Winds** newsletter. This short, electronic newsletter is distributed each month with links to various articles for more information.

To receive this monthly electronic newsletter, sign up at <https://extension.psu.edu/water-team-sign-up>.

Sanitary Well Caps

Pennsylvania is one of only a few states that do not have mandatory statewide construction standards for private water wells. As a result, some important components of a properly constructed drinking water well may not be present on some wells. The most important features missing from some private water wells are a sealed, sanitary well cap and a grout seal. These components are required by most states because they help protect groundwater by sealing the well from potential surface contamination.

Standard well caps simply bolt onto the well casing and often allow for entry of insects, surface water, or small mammals into the well. A "sanitary" well cap (also called a "vermin-proof" well cap) looks similar to a standard well cap but has a rubber gasket to seal the cap to the casing and vertical bolts joining the two pieces of the well cap.

A study by Penn State documented the effect of installing a sanitary well cap on existing water wells. Sixteen private wells that contained coliform bacteria were disinfected with chlorine and fitted with a sanitary well cap. Of these wells, 44 percent did not contain coliform bacteria one month later and 19 percent did not contain bacteria after one year. The sanitary well caps were most successful in eliminating bacteria from wells that previously contained small numbers of coliform bacteria (< 3 colonies per 100 mL of water), compared to those that had more gross contamination. This Penn State study also looked at bacterial contamination in new wells that were constructed with a sanitary well cap and a grout seal. Only 29 percent of these new wells contained coliform bacteria, suggesting that proper well construction practices can reduce but not completely eliminate bacterial contamination. Wells drilled into aquifers that are contaminated by animal wastes, septic systems, or surface water can contain coliform bacteria regardless of well-construction practices.

Sanitary well caps are inexpensive and can easily be installed on an existing well by a qualified water well contractor. To find a professional water well contractor in your area, consult the National Ground Water Association contractor look-up tool at <https://wellowner.org/find-a-contractor/>.



Insect infestation under a standard well cap (photo courtesy of Clark Beebe, MWON volunteer, Bradford County).



A sanitary well cap with a rubber gasket (photo by Bryan Swistock, Penn State Extension).

Upcoming Advanced Topic Webinar

MWON routinely provides advanced topic webinars for volunteers. The 25th webinar in this series will be presented on Tuesday, July 20th from 12:00 PM to 1:00 PM on **How to Find a Well Driller, Water Testing Lab, Treatment Vendor, or Other Professionals**. Water well, spring, and cistern owners often seek professionals to help with drilling wells, improving construction, shocking a well, having water tested, installing proper water treatment, or finding an unbiased expert to help with decisions. This webinar will demonstrate how homeowners can find professionals to help with basic water system management and maintenance. If you cannot join the live webinar, the recorded version can be accessed at <https://extension.psu.edu/programs/mwon/information/webinars>.

Topic: How to Find A Well Driller, Water Testing Lab, Treatment Vendor, or Other Professionals

Date: Tuesday, July 20, 2021

Time: 12:00—1:00 PM

Webinar location: <https://psu.zoom.us/j/977834187>



Important Web Links

Master Well Owner Network

<http://extension.psu.edu/water/mwon>

Penn State Extension Drinking Water

<http://extension.psu.edu/water/drinking-and-residential-water>

PA Ground Water Association

<http://www.pgwa.org/>

National Ground Water Association's Information for Well Owners

<http://www.wellowner.org/>

Penn State Drinking Water Interpretation Tool (DWIT)

<http://dwit.psiee.psu.edu/>

A Complete Listing of Penn State Resources for Well and Spring Owners

<https://extension.psu.edu/resources-for-water-well-spring-and-cistern-owners>

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