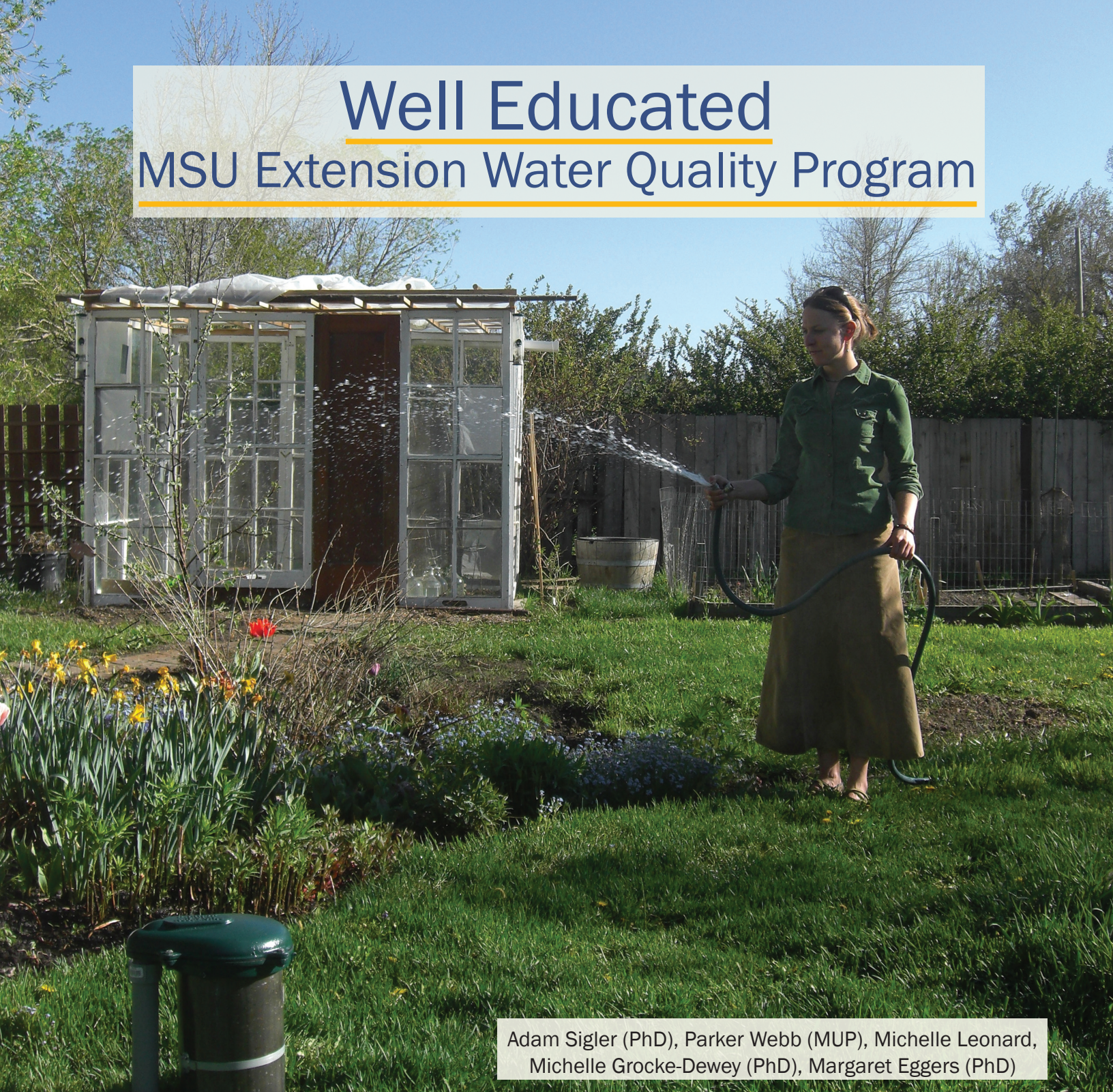


Well Educated

MSU Extension Water Quality Program



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The goal of the Well Educated program is to provide private well owner education about water quality as it relates to human health and quality of life as well as use for livestock and irrigation. The program is a collaborative effort between MSU Extension Water Quality (MSUEWQ) and partners in participating counties and provides well owners with materials to sample their well water quality. The outcome is a service that informs well owners about issues with their water quality related to specific uses and what solutions are available. The program also provides education to help prevent nonpoint source ground water contamination while simultaneously providing means to monitor groundwater quality. To learn more visit waterquality.montana.edu/well-ed/ or scan the QR code below:



Survey Distribution

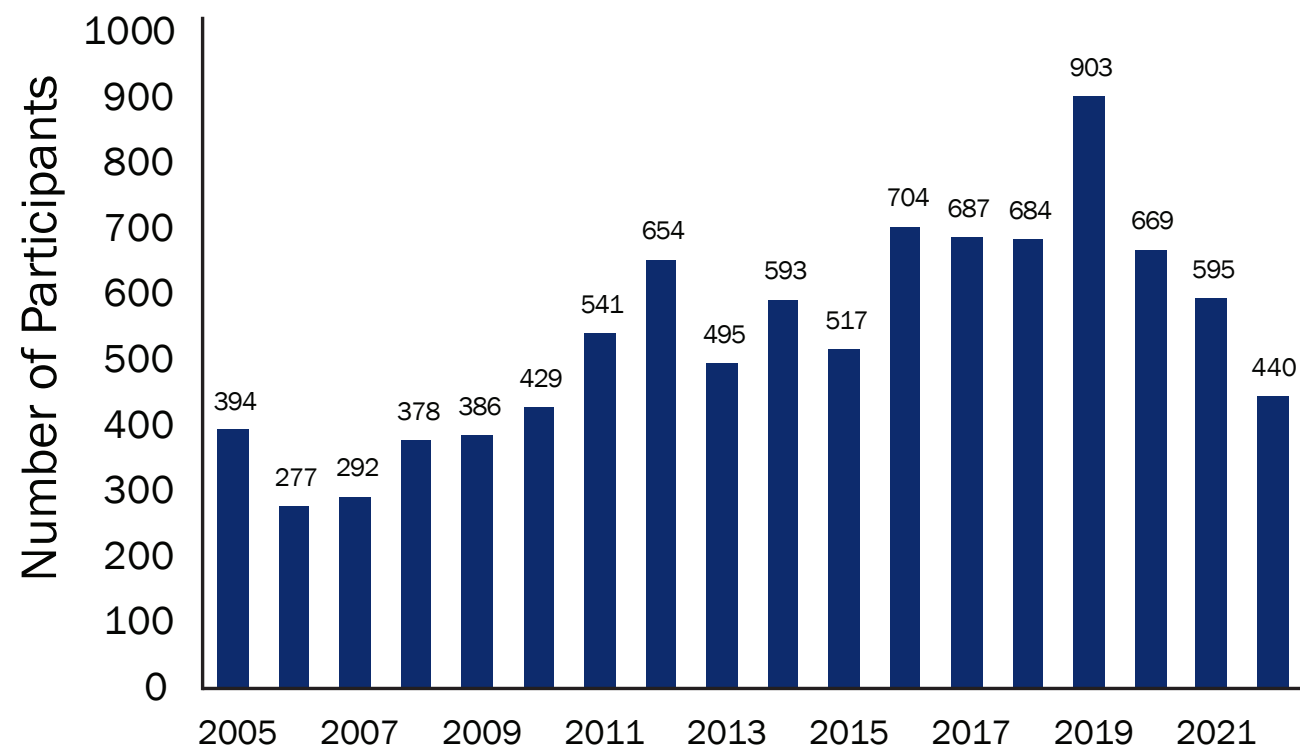


595 people participated in the Well Educated Program in 2021.

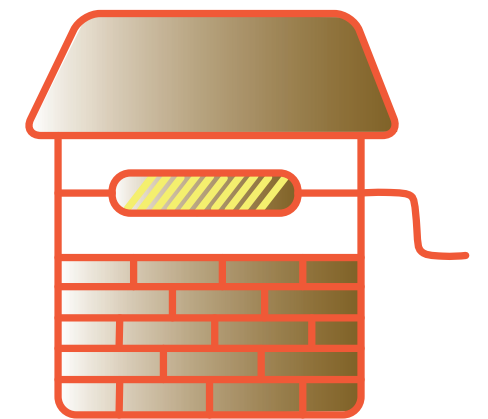
Survey invitation emails were sent to **382** unique email addresses, of which there were **116** responses for a **30%** response rate.

The survey targeted Well Educated program participants for 2021, specifically those participants prior to a significant enhancement in the results delivery method that occurred on November 3rd that year. Only participants with a valid email address were included and only one survey request was sent to participants that submitted multiple samples to the program.

Program Participation Through The Years

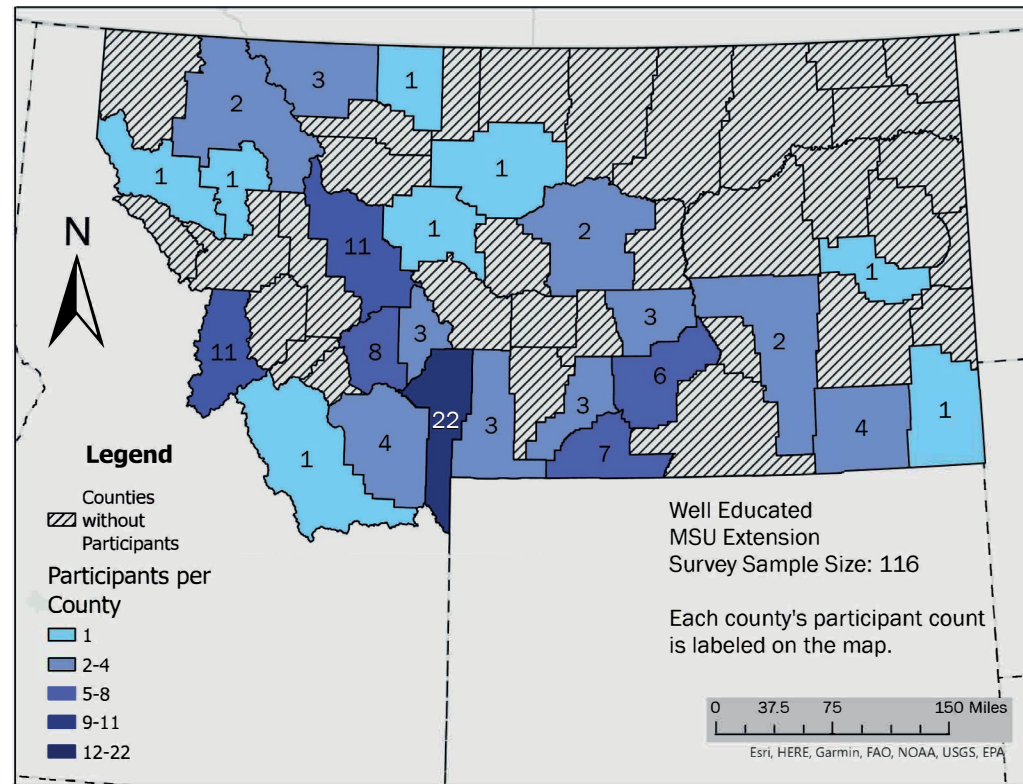


116 well owners participated from **24** different Montana counties.

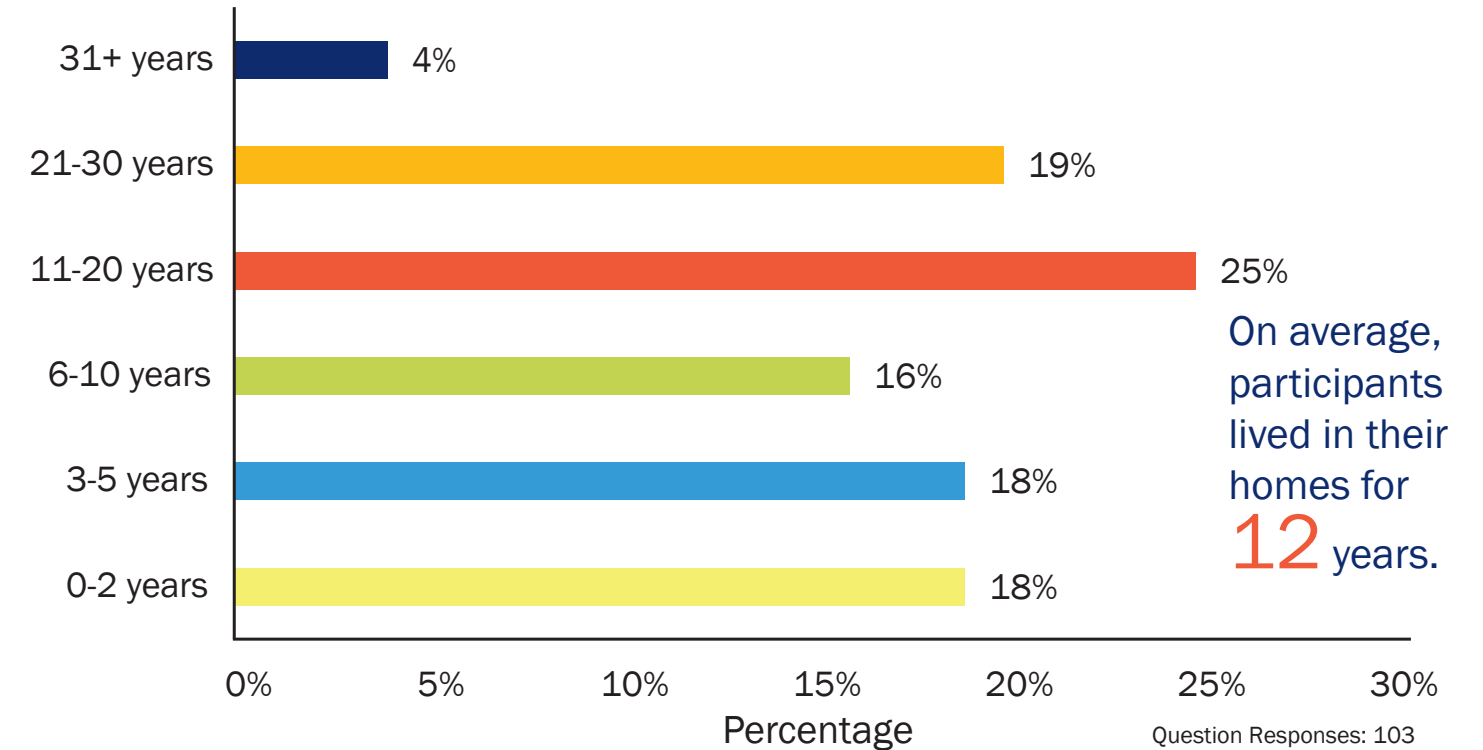


This report presents data specific to the 2021 survey and program data in general.

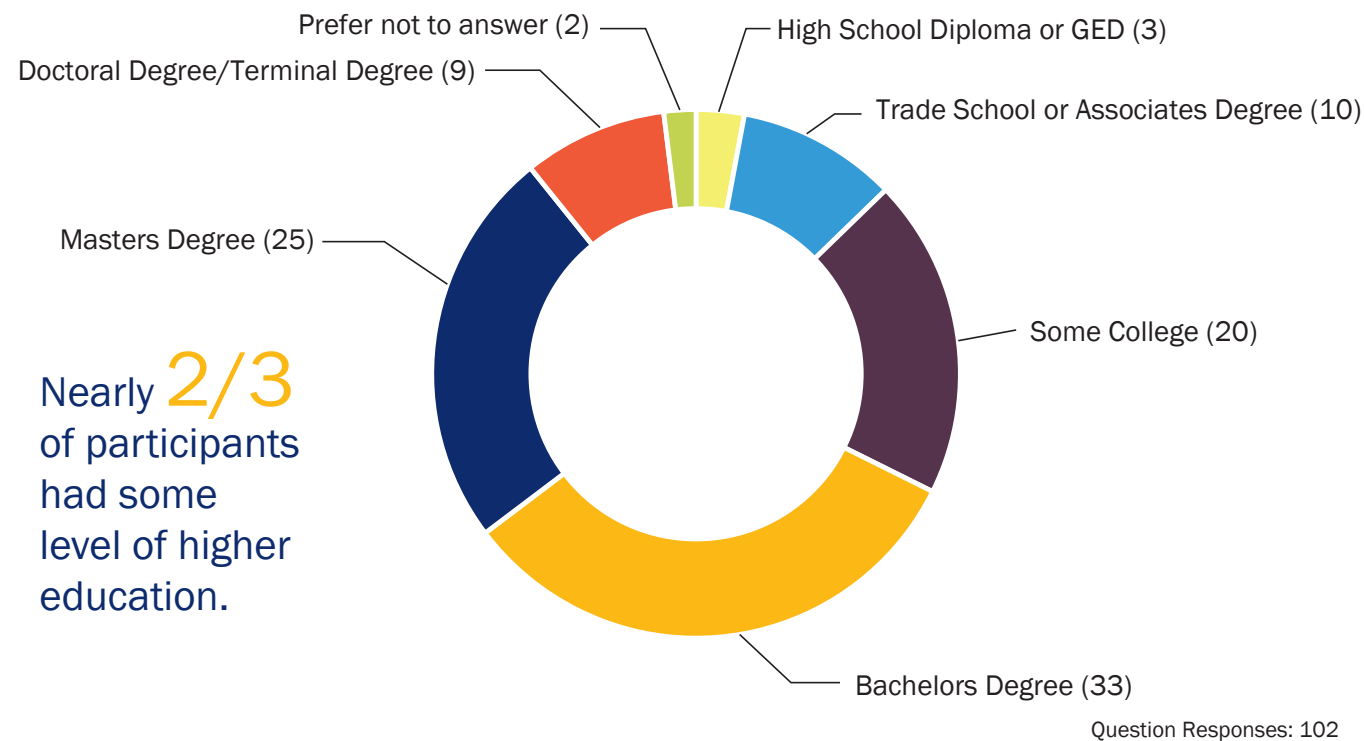
Well Educated Survey Participants by County



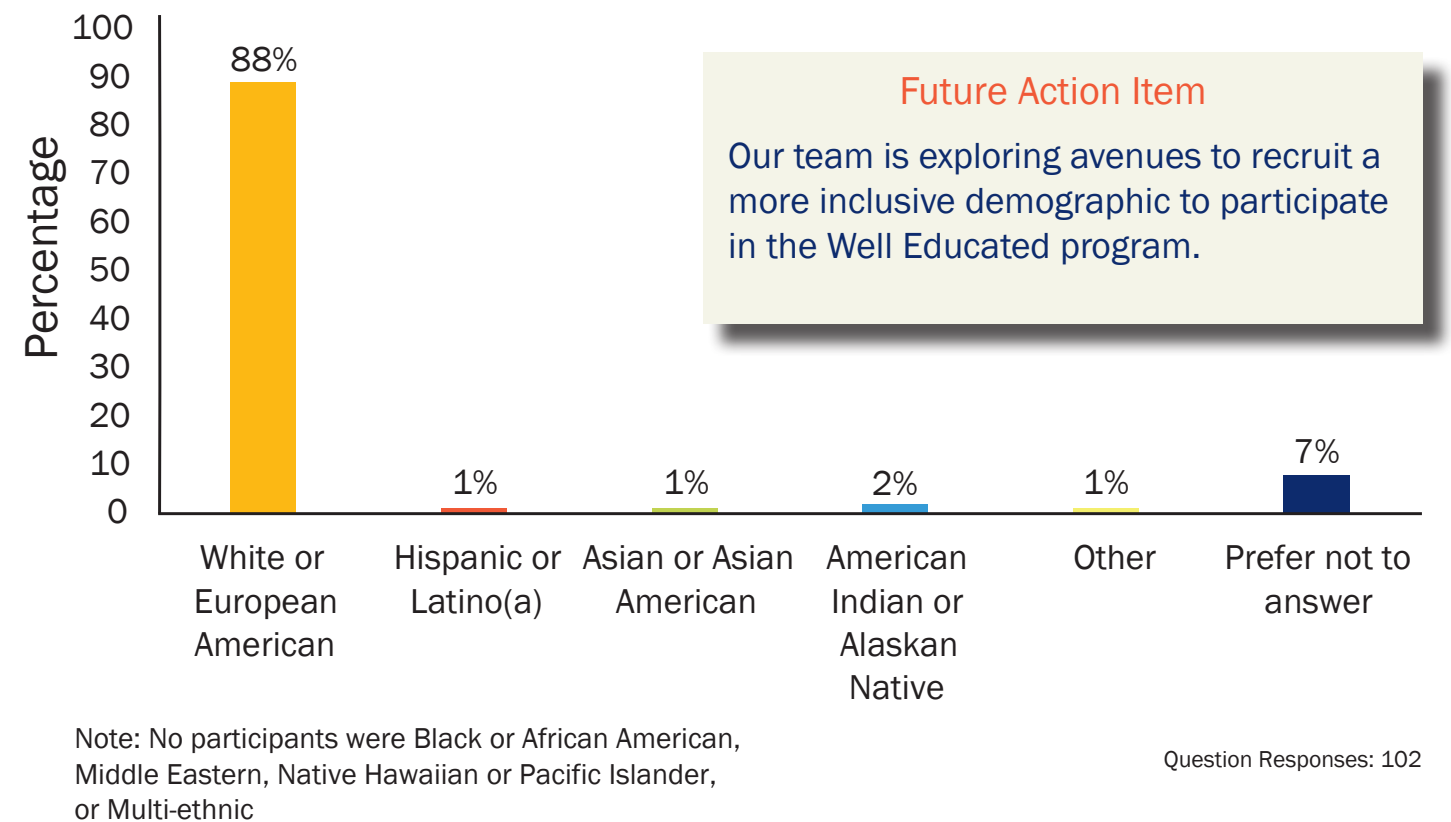
Years Living in Home



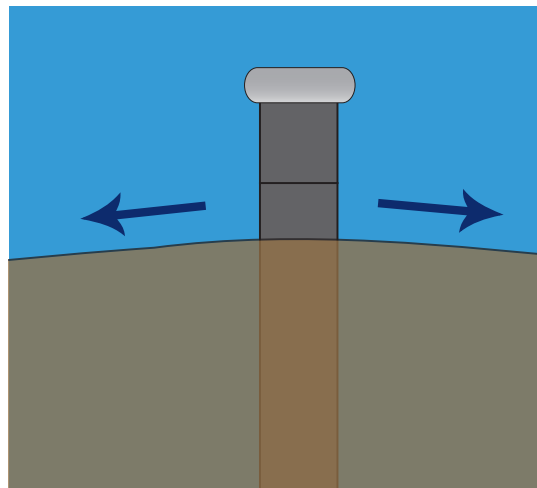
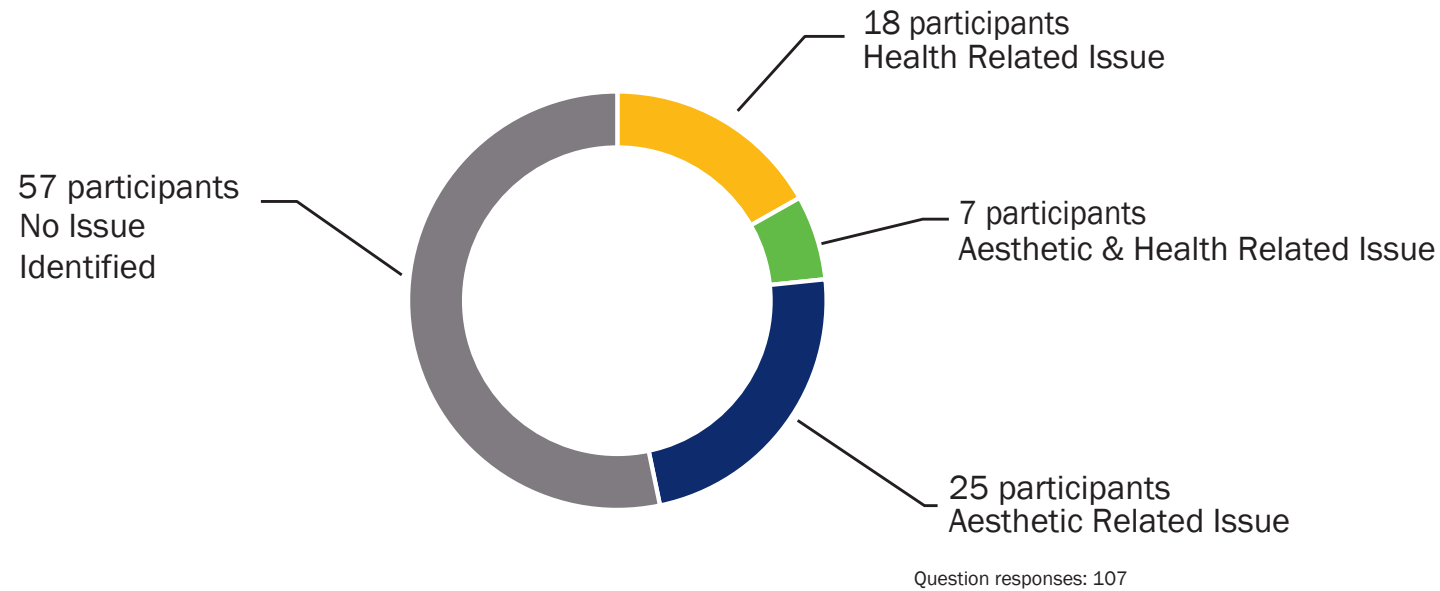
Level of Education



Survey Participants' Racial & Ethnic Breakdown



Water Quality Issues Revealed by Survey



Well Head Assessment & Protection

- Ensure the well cap is in good condition
- Ensure the ground is sloped away from the well so that water does not run past or pool around the well head
- Well head height should be 18 inches above ground surface; ensure the height is at least 12 inches
- Keep chemical/fuel storage, livestock, and any other potential contaminants away from the well head

Top 8 Parameters of Water Quality Health Issues



27% of samples had Total Coliform present, which is a general bacteria that should not be present in groundwater and indicates possible contamination.

Mn

13% of samples had manganese over the State of Montana's health advisory level of 0.1 ppm, which can cause neurological (brain and nerve) development issues in children.

As

10% of samples had arsenic over the 10 ppb threshold that is used for public water supplies, indicating risk of various types of cancer, skin problems, circulatory and other health issues. Over a lifetime of consumption, even arsenic concentrations less than 10 ppb are known to increase health risks.



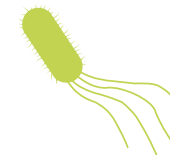
7% of samples indicated the potential for causing corrosion and, therefore, the potential to release lead and copper into water if those metals are present in plumbing. Lead can cause neurological, kidney, and other issues, especially in children. Copper can cause liver, kidney, and other health issues.

NO₃⁻

3% of samples had nitrate over the public drinking water standard of 10 ppm, which can cause severe oxygen deficiency in infants and cancer risk in adults. For infants, high nitrate in drinking water (including in formula) can be fatal.

F⁻

3% of samples had fluoride over the public drinking water standard of 4 ppm, which can cause bone disease and discoloration of children's teeth.

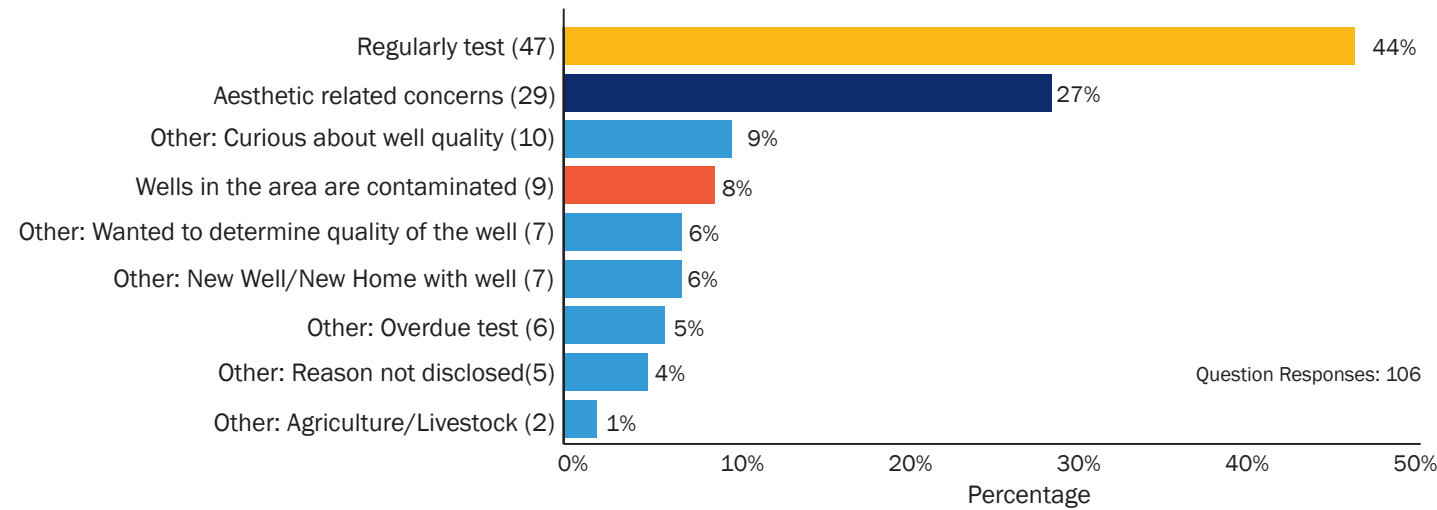


3% of samples had E. coli present, which indicates contamination from a fecal source and risk of waterborne disease.

U

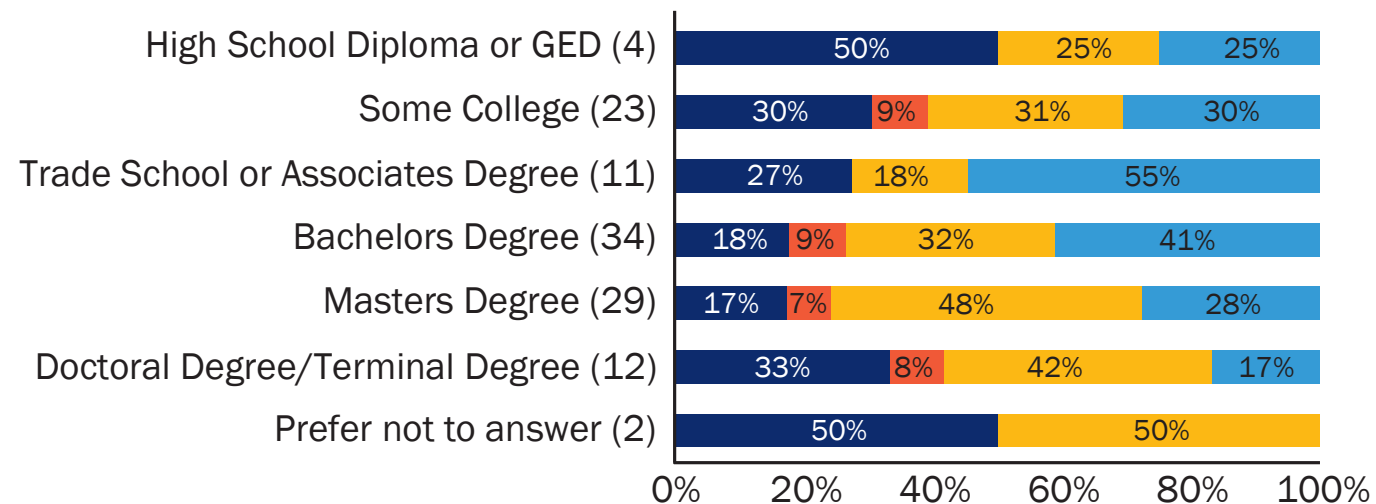
2% of samples had uranium over the public drinking water standard of 30 ppb, indicating a risk of cancer and kidney damage. Over a lifetime of consumption, even uranium concentrations less than 30 ppb are known to increase health risks.

Reasons for Participating in the Well Educated Program

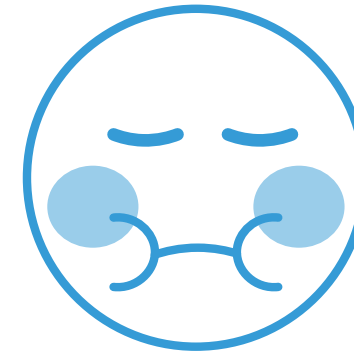


Aesthetic concerns are a strong reason for participation. Unfortunately, many health issues are not aesthetically noticeable.

Reasons for Participating by Education Level



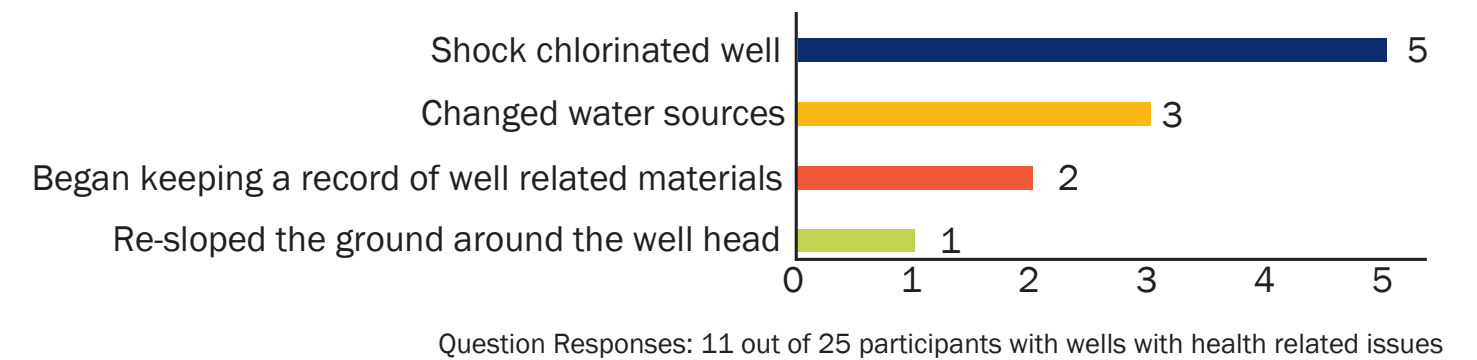
- I am concerned about water quality due to color/taste/smell
- I learned there are contaminated wells in my area
- I test my well regularly
- Other



23% of responses indicated wells had health related water quality issues

Changes Implemented to Improve Water Quality: Health Related Issues

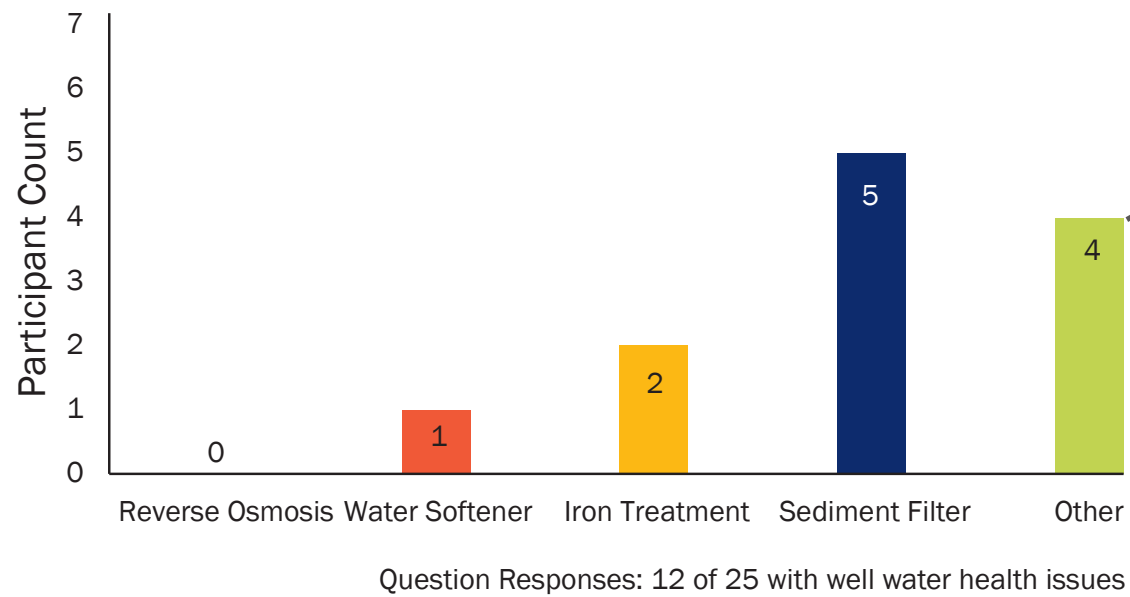
44% of participants with wells containing health related issues made changes to improve water quality



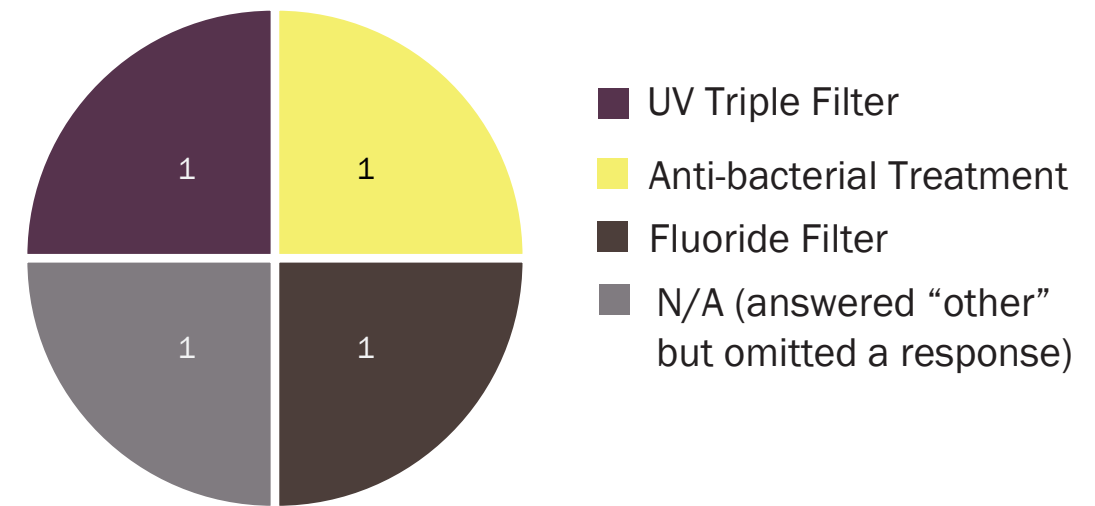
Note: Changes implemented is not a count of survey participants who installed treatment systems. Treatment installation is discussed on the following page.

No changes were made for replacing well caps, removing a contaminant source near the well head, installing back flow prevention, pumping septic tanks, beginning to keep a record of septic related materials, or decommissioning an abandoned well.

Treatment Installed after Participating in the Well Educated Program: Health Related Issues



Other Treatment Responses



48% of participants with wells containing health related issues installed treatment after participating in the program.

30% of participants had aesthetic water issues

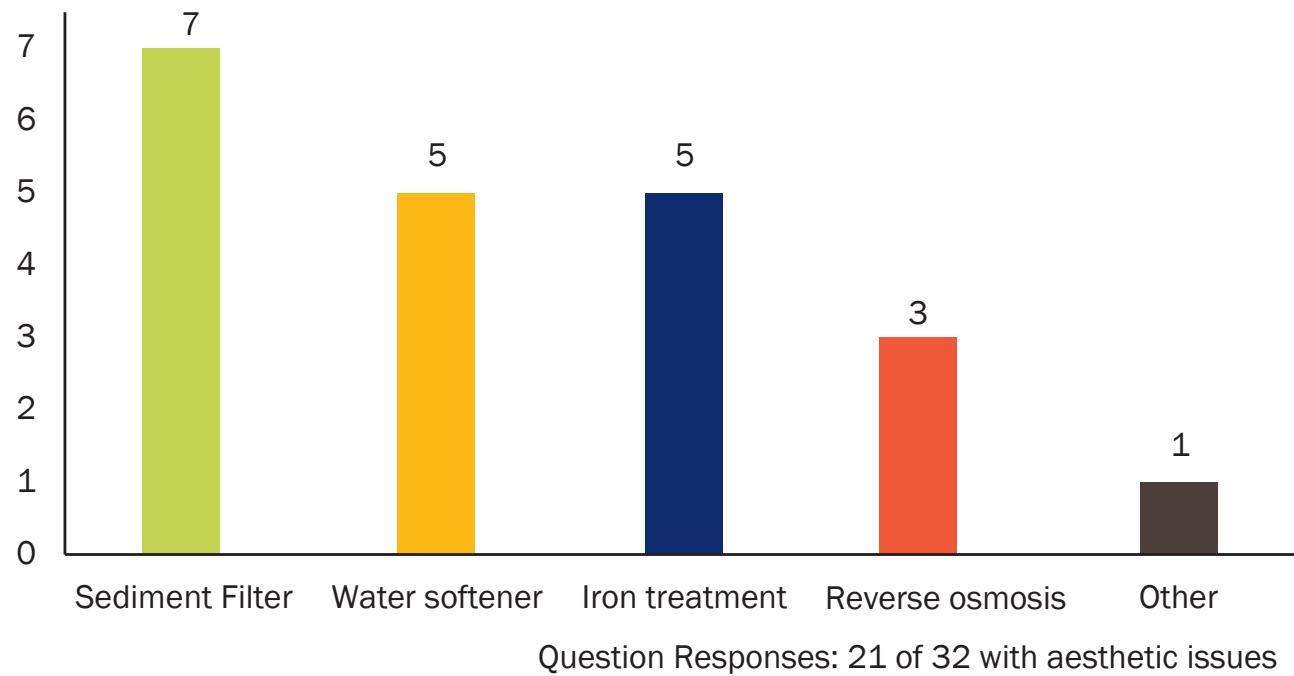


Aesthetic issues include color, taste, smell, staining, and hardness.

Health issues are not addressed by many of the treatments participants installed. Instead, the treatments address aesthetic water issues.

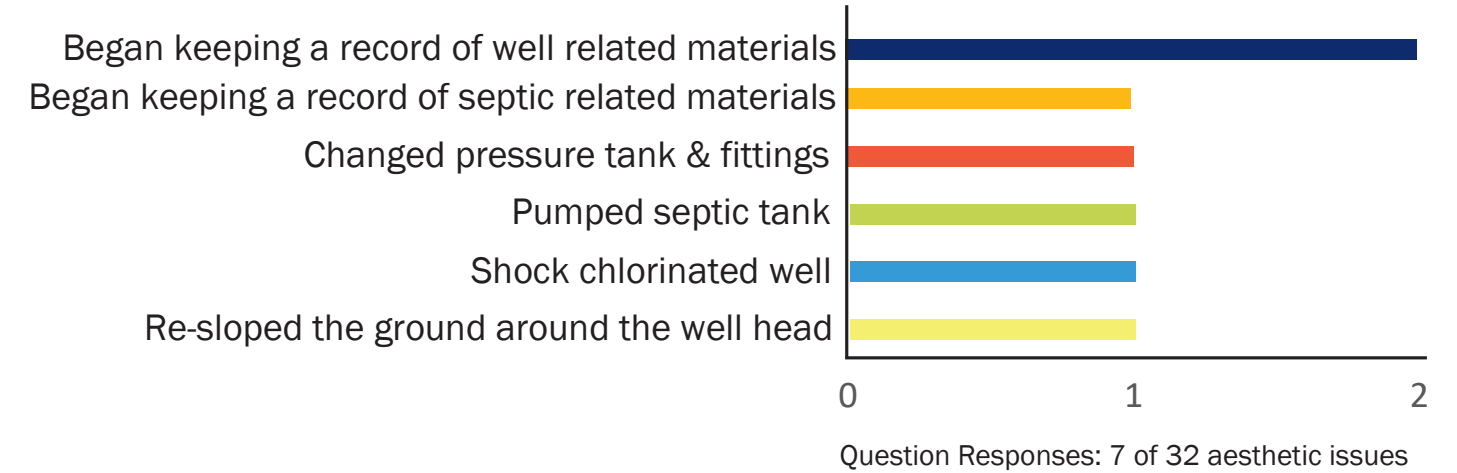
Treatment Installed after Participating in the Well Educated Program: Aesthetic Issues

66% of participants with aesthetic water issues installed treatment after participating in the program.

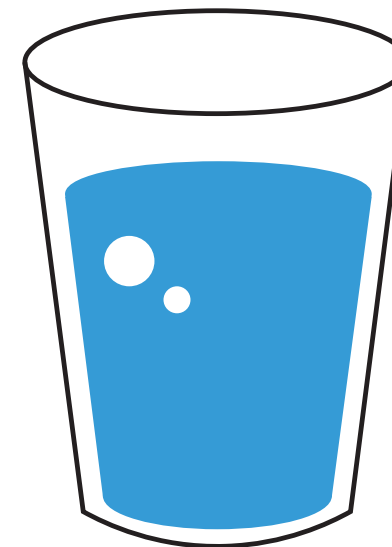


Iron staining, as seen in the picture to the left, is a common aesthetic issue.

Changes Implemented to Improve Water Quality: Aesthetic Issues



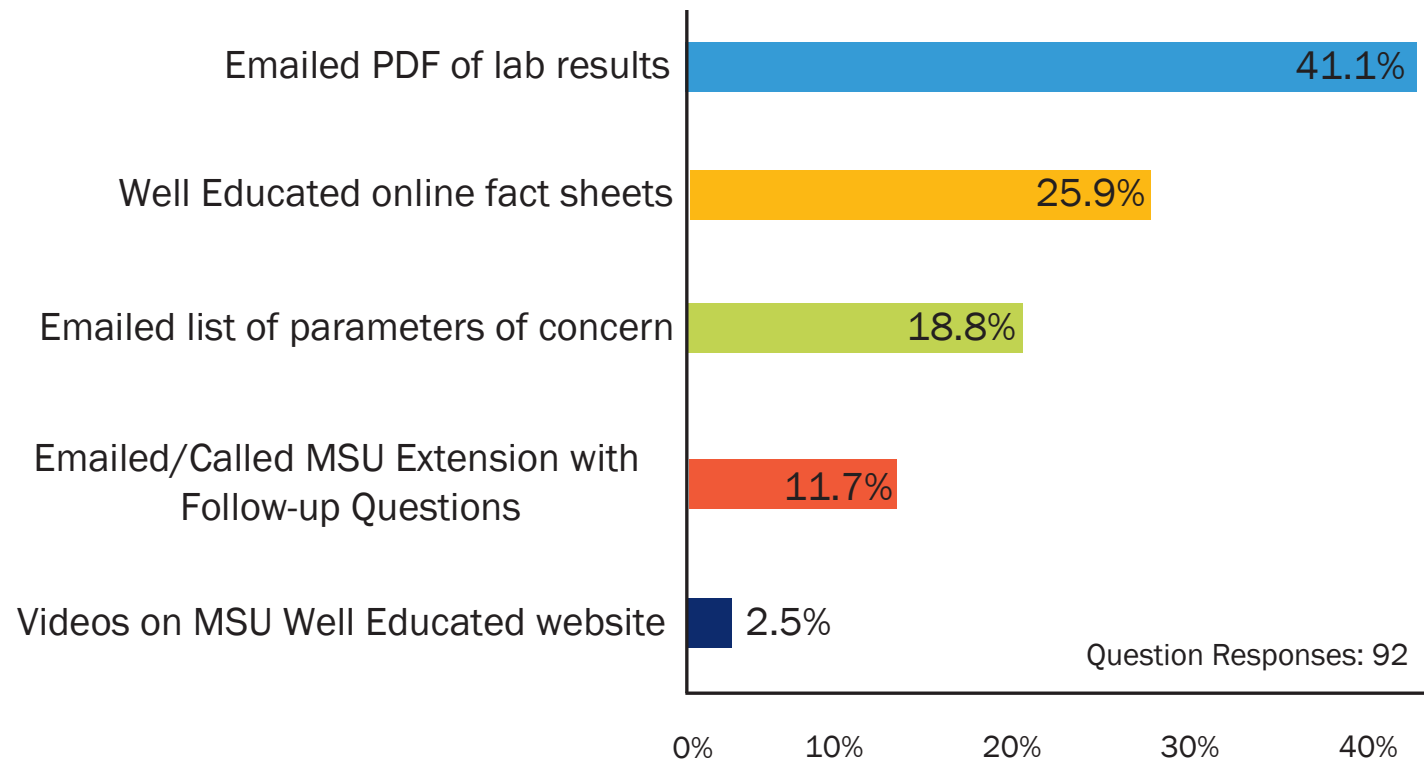
No one replaced well caps, removed a contaminant source near the well head, installed back flow prevention, or decommissioned an abandoned well.



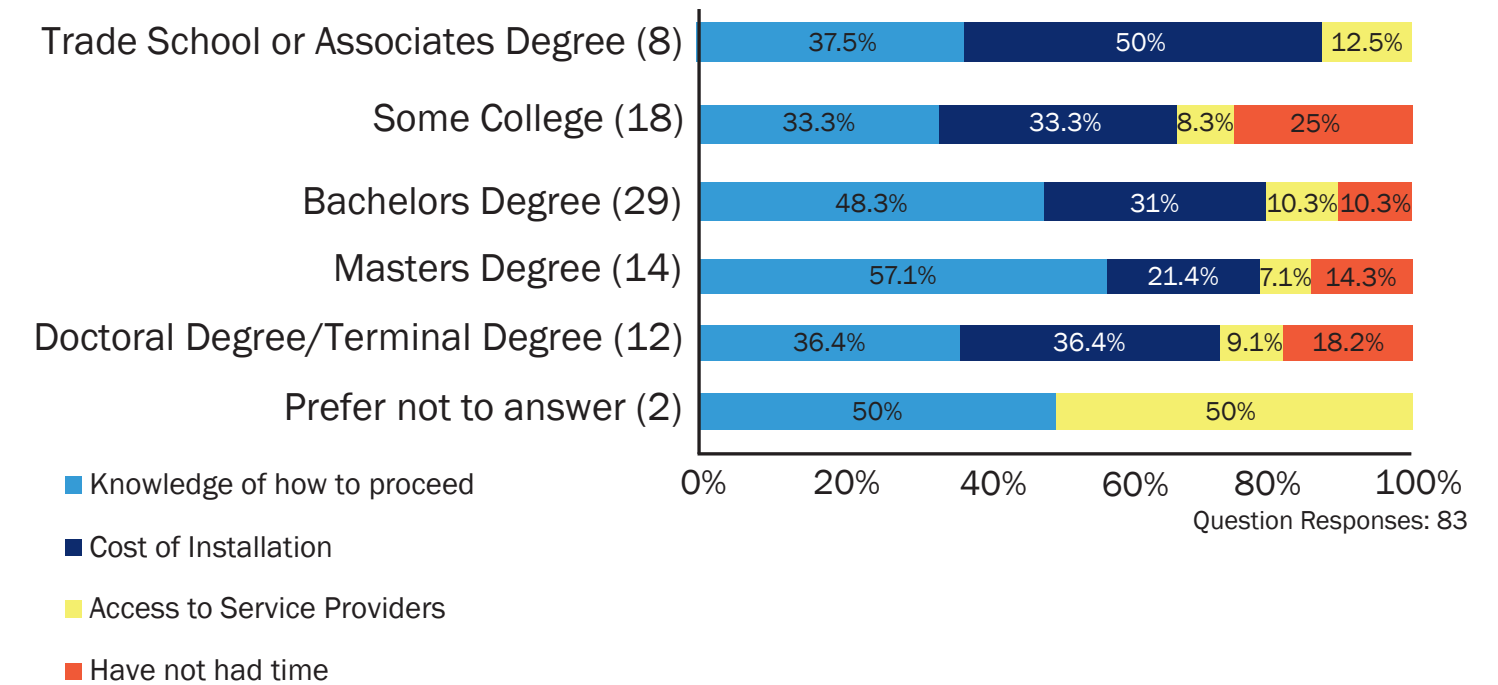
Two participants with aesthetic water issues changed water sources for drinking water after participating in the Well Educated program.

No water sources were changed for cooking, bathing, livestock, or irrigation.

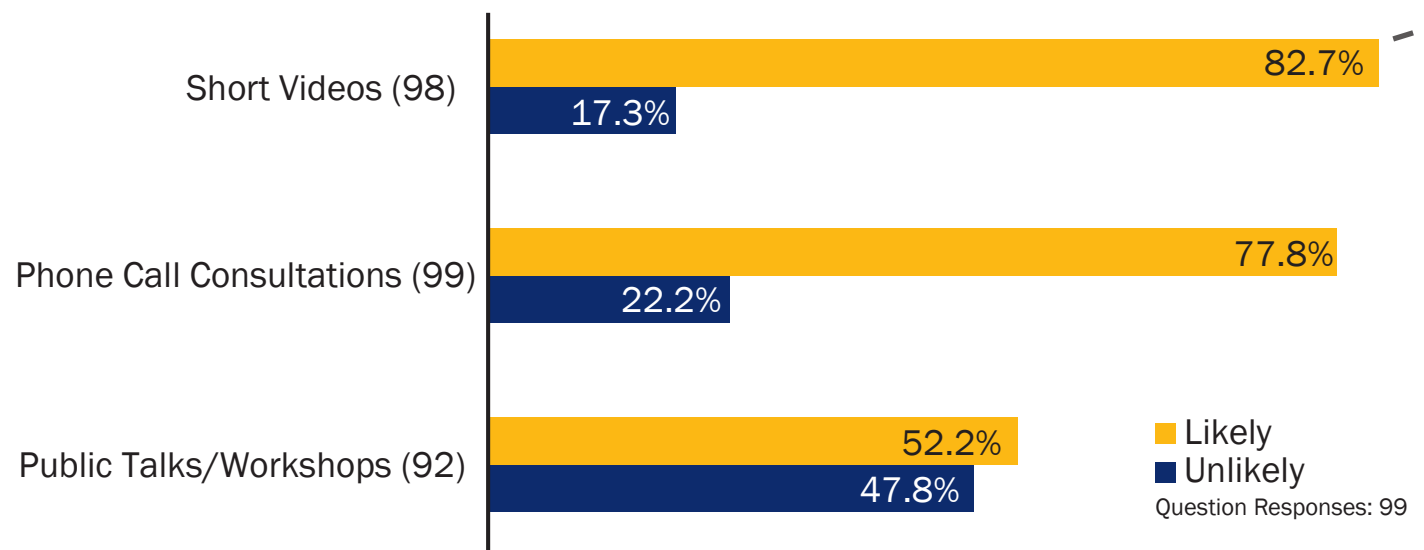
Prior Use of Well Educated Education Resources



Barriers to Installing Treatment by Education Level

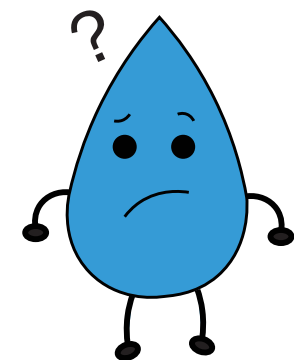


Likelihood of Using Well Educated Educational Resources



"Likely" and "very likely" responses were combined.
 "Unlikely" and "very unlikely" responses were combined.

Future Action Item
 Given the high interest in short videos, the Well Educated Program is planning on recording new, short educational videos.

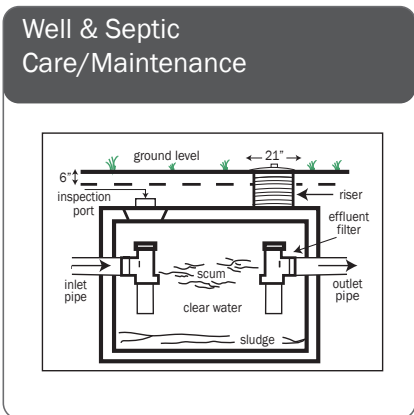
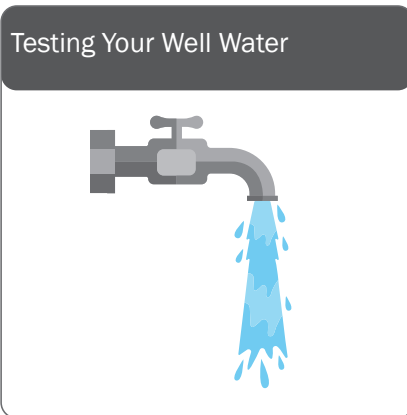


Across education levels, **knowledge of how to proceed** was the **greatest barrier** to implementing water quality treatment.

Navigating the Well Educated Program Website

Explore avenues for getting wells tested, and where to pick up tests.

Begin to make sense of test results through a video and an interpretation tool to identify what application the well water is suitable for.



Learn more about effective and common treatment types.

Take a look at information for well & septic care and troubleshooting.



We are here to help!
For more information, contact
Adam Sigler and the Well Educated Team
welleducated@montana.edu
(406) 994-7381



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