Well Educated

Private Well Testing Program Guidance

Version 1.2 – March 2011

USDA National Institute of Food and Agriculture (NIFA)
Northern Plains and Mountains Regional Water Program

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Applying knowledge to improve water quality
Northern Plains & Mountains Regional Water Program
A Partnership of USDA NIFA & Land Grant Colleges and Universities

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Overview of Well Testing Programs

Why Offer a Well Testing Program?
The Safe Drinking Water Act (SDWA) was passed in 1974 to protect public health by regulating municipal and community drinking water sources. Individuals connected to a municipal system enjoy drinking water that has been tested and treated to meet SDWA regulations. Private water supplies are not covered under the SDWA and are not typically monitored by government agencies. Therefore, it is the sole responsibility of private well owners to test the quality and safety of their private well water supply. A well testing program is a public education program which guides private well owners through the process of testing their water, helps them to interpret their water quality results, and reminds them about the importance of testing.

Groundwater is often thought to be a safe and reliable water supply; however, both natural and human caused water quality impairments do occur. Septic systems, fertilizer application, and animal waste storage are just a few examples of contamination sources. Testing is the most accurate way for well owners to learn about the quality of their well water. Basic testing is not complicated or expensive, but many homeowners do not know where to begin. Providing a well test program offers well owners guidance on how to collect samples and which parameters to select for analysis. Well owners should test their water annually for bacteria and nitrate and should consider a more comprehensive test every four years.

Percentage of US county population served by private wells in 1995

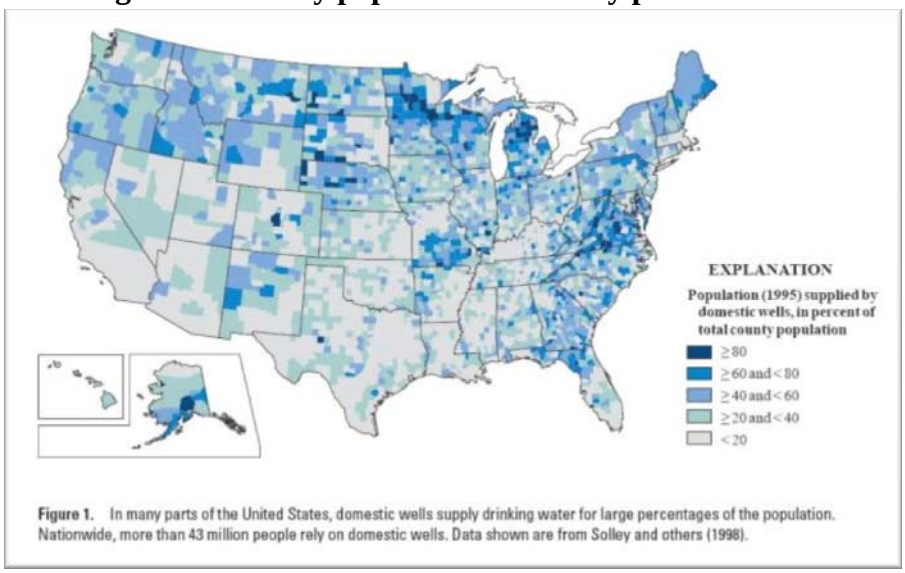


Image 1: USGS Circular 1332: Quality of Water from Domestic Wells in Principal Aquifers of the United States

Benefits of a Well Testing Program

Benefits to the Coordinator:

A well testing program is a great opportunity for the coordinator to provide well and septic educational materials to an interested audience. People who are involved in testing their water quality are more likely to be interested in educational materials on their well and septic systems and how they are connected to groundwater. The results are also available to the coordinator to enhance understanding of groundwater quality to inform management or public education efforts. The data may be used to establish baseline conditions, monitor trends through time, or help identify emerging contamination issues. The coordinator invests the time to manage the program, but some or all of the sample analysis cost can be deferred to the well owners.

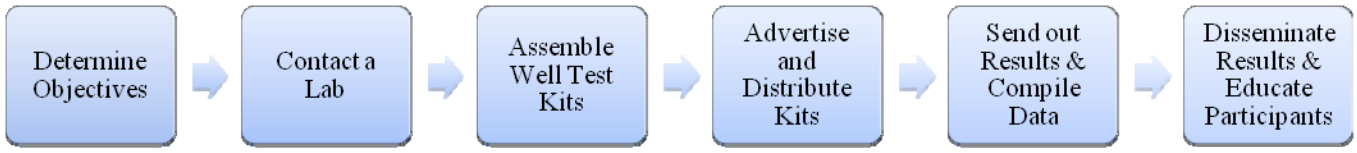
Benefits to the Well Owners:

Well owners benefit from guidance on how to conduct sample collection, alleviating uncertainty about collection procedures. Well owners will receive assistance interpreting results and gain a basic understanding of their well water quality. This process may help homeowners find issues with their well and learn how to remediate the problem. Well owners are reminded that it is a good idea to test annually to determine water quality trends and because bacterial contamination is an ongoing risk. Another benefit is that labs may offer bulk discount pricing for a program that is testing numerous wells.

Benefits to the Testing Lab:

A well-structured program results in water samples arriving at the lab in a consistent format with a consistent set of parameters to be analyzed based on the package choices offered. Distribution of results for the program is also simplified for the lab because all results typically go to the coordinator. The educational materials that accompany the program should reduce the number of questions the lab receives about procedures and results interpretation which saves the lab time.

Program Overview at a Glance



Important Considerations

1) Objectives:

Before beginning the program, it is important to first identify the goals for the program. Would you like to offer the program for public education, baseline data collection or for investigating a water quality issue? It is also important to decide which water quality parameters you are interested in analyzing. Once you have set your main objectives, you can start building a Well Educated program to fit your needs.

Depending on your program objectives, here are some examples of considerations:

Education:

- Who do you want to reach?
  - Subdivisions, small acreage, ranchers, farmers
- What do you want them to learn?
  - Water suitability for drinking & irrigation, how to maintain septic systems, how to manage land around the well or property in general, how to protect a well head, etc.
- What media is going to be most effective?
  - Face-to-face interactions can be an effective way to get the word out. This can be done one-on-one or in workshops. Fliers, videos, radio and newspaper announcements, or web based information are also ways to publicize the program.

Baseline Data:

- What parameters are you interested in measuring?
- What are the considerations for geographic distribution of samples?
  - Different aquifers, potential sources of contamination, land uses, areas of potential future land use changes, etc.
- Timing – seasonal differences in water quality may occur. Focusing testing in one season can simplify interpretation of trends.
- Try contacting other monitoring entities such as the DEQ, USGS, or a local university to acquire a greater data set.

Problem Investigation:

- What is the geographic area of the problem?
- Is the problem specific to one aquifer or one well?
- What are the timing considerations associated with the problem?
- Is it possible to get program participants in the right areas to sample at the right times to investigate the problem?

2) Coordinating with a Testing Lab:

Developing an agreement with a testing lab is an important early step in the program development process. The lab must be capable of testing for all of the parameters you are interested in and must be able to handle the number of samples you plan to collect within the designated holding time. The sample holding time for *E. coli* is only 28 hours which will require close coordination with the lab to get samples delivered and processed in time. The testing lab should be prepared to give you a competitive price if you are going to be dealing in large numbers of samples and will be taking care of the public interface part of the process. Labs can spend an extensive amount of time with well owners on the phone. The well test program coordinator is in a position to alleviate some of that work load for the lab through sample handling, results dissemination, and assistance with results interpretation. These are a few points to bring up when discussing analysis costs with the lab.

Discuss whether you will be using a chain of custody form or a simpler specialized sample tracking sheet (see the MT Well Educated Registration Sheet in the Appendix as an example). Discuss whether special labels on the bottles would be helpful to the lab for distinguishing samples that are part of the program. Discuss handling requirements and decide if samples should be hand delivered or mailed through a parcel service. Results should ideally be distributed to participants through the program coordinator; discuss how this will occur.

Lab results typically consist of a cover sheet, a copy of the chain of custody, results pages and pages outlining data quality assurances. Consider simplifying what the homeowner receives. By only giving the well owner the results pages, this can help alleviate confusion. f the program coordinator receives results from the lab to deliver to participants, then the coordinator can include the educational materials with the results. If compiling results from the lab is of interest, talk with the lab about receiving an Electric Data Delivery (EDD) file. This is a single spreadsheet with all of the results that the lab has processed for the project.

3) Coordinating with local entities:

Another option in administering the Well Educated program is to coordinate with other local entities such as: your local health department, local watershed groups, conservation districts, environmental groups or local nonprofit groups. Partnering with another entity in the area can help increase well test kit distribution and the impact of the program.

4) Program Advertising:

Reaching the target audience can be a big challenge with a well testing program. Local papers, radio advertisements, fliers, and direct mailings are some advertising options. Booths at public events and word-of-mouth can also be effective for getting well owners interested in participating. Subsidized costs or competitive testing costs can help attract participants. It is also important to mention in advertisements that no government agency oversees private well water quality. It is the responsibility of the well owner to insure their family's drinking water is of good quality. Advertisements should make it very clear where well owners go to pick up test kits.

5) Distributing Well Kits (a few options):

Test kits should be available at an office that maintains regular office hours. The easier it is for people to pick up kits the more likely they will participate in the program. Well test kits can be distributed at workshops, fairs, booths at public events, or even mailed participants in remote locations. Another option for kit distribution is to have participants pay for analysis when they pick up the kit. This way they are invested from the start.

6) Collecting and Transporting Samples to the Lab:

Some form of paperwork needs to accompany the sample bottles to the lab. A lab typically uses a standardized chain of custody for this purpose.[1] It may be possible to arrange a simplified paperwork format specific to your program (see the MT Well Educated Registration Sheet in the Appendix as an example[2]).

- **Note:** If groundwater mapping is one of the goals, than designate space on the sample paperwork for the participant to enter well coordinates. Location can be determined by GPS, mapping software, or an internet based mapping program. Physical mailing addresses can be georeferenced with GIS software.

<u>Facilitator Collection and Delivery Option:</u>

- The program coordinator makes arrangements to have participants sample on a designated day and deliver samples to a central location at a designated time for bulk delivery to the lab.
- The coordinator collecting the samples should make sure all samples are labeled properly, that paperwork is in order, and that necessary payment is collected when samples are dropped off.
- Samples should be placed on ice in a cooler at the time they are received until they are delivered to the lab and any special handling instructions noted by the lab should be followed. Samples need to be hand delivered or shipped to the lab promptly to meet holding time restrictions.

[1] A traditional chain of custody includes contact information, a list of parameters each sample will be tested for, sample ID, sample time and date, number of bottles per sample, and signatures of people who have handled the samples. These can be very confusing for homeowners and an alternative should be considered.

[2] For the MT program, the registration sheet includes a number of questions about the well, surroundings, and water use. This registration sheet is the primary sample tracking mechanism and accompanies the samples to the lab. The lab mails them to the state program administrator so the well information from them can be entered into the centralized database with the water quality results.

Participant Mailing Delivery Option

- Participants can mail samples independently, sending them directly to the lab.
- Inquire with the lab and/or local parcel service carriers to determine the best options for participants to ship samples.
- Pre-addressed mailing envelopes are a good idea.
- Make sure participants understand holding time requirements and the importance of sampling as close to the time of shipment as possible.

7) Delivering Results to Participants:

If education is the main objective of the program, then the lab can mail results directly to the participant. If data collection along and education is the main objective, then the results should be routed to the coordinator. The coordinator can then include the appropriate educational materials with the results. Below are two choices for the program coordinator to distribute results.

1. Participants pick up results:
   If a county or local office is available where participants can stop by to pick up results, the cost of mailing the results can be conserved. If participants pick up their results in person they are much more likely to have questions which can require a significant time investment from the person handing over the results. However, this puts the program coordinator in direct communication with the participants to make sure they receive the maximum benefits from the program. This option may also result in a higher volume of phone calls from participants inquiring if their well test results are ready to be picked up.

2. Mailing results:
   The program administrator can also mail test results to participants with educational materials. This adds the cost of mailing envelops and postage to the project. If this option is used, have participants fill out a return address label at the time samples are dropped off. This will save time in addressing result packages and insure use of the appropriate address.

8) Compiled Results:

If data collection is a goal, it is important to communicate this goal to the participants and get their permission to use their results. Data sharing can be stipulated as a requirement for participation or it can be an option participants select on the sample tracking materials. Arrangements should be made with the lab beforehand about what data will be entered associated with samples for delivery in the EDD. At a minimum, samples should be identified with the participant's name, sample date, and a sample ID. If available, geographic coordinates of the well location can also be very beneficial. There will be a limit to the amount of information the lab will want to input for each sample. However, additional information can be collected on the sample tracking paperwork and entered into the EDD or database later by the program coordinator. For example, with the MT program, all data collected that is not input by the lab, is manually entered into Access and joined with the results received from the lab (see appendix for MT registration sheet example).

9) What to do with the Data:

Depending on your program goals, there are a number of options for synthesizing and presenting data. You may share the results in a publicly accessible database; produce summary statistics about the concentrations of different parameters or map results using GIS software. Sharing information at workshops or local venues can be a good way to share data. If you want to reach a wider part of the community, contact a local newspaper or magazine and run an article about the program goals and run a follow up article about the results. Another option can be to contact a local news station and run a short segment about the program.

This is your program and all programs will be slightly different in their goals, procedures, and design. Use this guidance document and adapt it to fit your needs

Checklist for Starting a Well Test Program

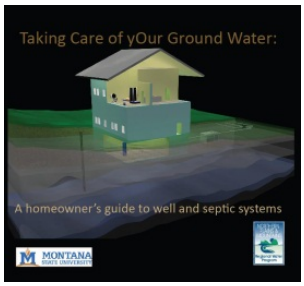
___ Identify the main goals and objectives of the program
___ Identify and contact possible partners for the effort
___ Contact an analytical lab in your area to do the water analysis
___ Discuss pricing and possible bulk discounts
___ Discuss sample handling requirements and what paperwork and labeling will need to accompany samples
___ Develop a protocol for delivering water samples to the lab
___ Discuss how the results will be delivered to participants
___ Discuss an electronic data delivery (EDD) spreadsheet of the final compiled results (if you are collecting the data)
___ Gather or develop informational materials that will be included in the kits and prep kits: sampling instructions, sampling documentation, etc. Factsheets available at: http://region8water.colostate.edu/well_educated.shtml
___ Determine the best method for sample bottle distribution
___ Advertise
___ Distribute Kits
___ Deliver samples to lab
___ Deliver results to participants
___ Synthesize compiled results for a newspaper article, maps, or a report
___ Solicit feedback from participants on changed knowledge and/or behavior

APPENDICES

A. List of Resources Available for Well Testing Programs
B. State Coordinators for the Regional Water Program
C. Frequently Asked Questions about Well Test Programs
D. Program Example: Montana's Well Educated Well Test Program
E. Program Example: Colorado Well Test Programs
F. State Contacts for Lists of Certified Analytical Labs
G. Sampling Instructions, Registration & Parameter Info Sheet Examples
H. Flier for the Well and Septic DVD "Taking Care of yOur Ground Water"

Resources Available For a Well Testing Program

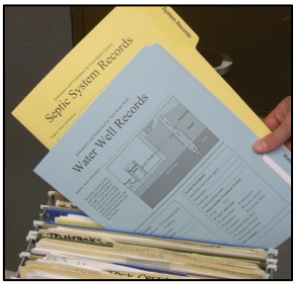
- **This guidance document**
- **An interpretive factsheet "Understanding Your Test Results" compares water quality results to drinking water standards**
  http://region8water.colostate.edu/well_educated.shtml
- **Factsheets for water quality parameters of interest**
  http://region8water.colostate.edu/well_educated.shtml
- **Sampling instructions, registration and parameter information sheet examples (Appendix G)**
- **An online interpretive guide for water quality results**
  http://region8water.colostate.edu/wqtool/index.cfm
- **DVD "Taking Care of yOur Ground Water"**
  Video Sections:
  - Taking Care of yOur Ground Water: A homeowner's guide to well and septic systems (16:28)
  - Protecting the Wellhead (10:25)
  - Septic System Function and Maintenance (9:30)
  - Water System Considerations for Buying or Building a New Home (10:11)
  - Sampling for Well Water Quality (6:25)
  - Interpreting Water Quality Results (8:35)
  - Chlorinating a Well and Water System (9:27)
  - Water Treatment Basics (6:38)



  Available on DVD for $4.00 through MSU Extension Publications
  http://www.msuextension.org/publications.asp

  Or viewable on the web at
  http://waterquality.montana.edu/docs/videos.shtml

- **Flier for the Well and Septic DVD (Appendix H)**
- **Informational folders for keeping well and septic files (contact your state coordinator for the regional water program for copies – see appendix B for contact information)**
- **USGS Circular 1332: Quality of Water from Domestic Wells in Principal Aquifers of the United States**
  http://pubs.usgs.gov/circ/circ1332/
- **Montana Well Educated Program Quality Assurance Project Plan (QAPP)**
  - **Contact us at** waterquality@montana.edu **for a copy**



State Coordinators for the Regional Water Program

Check the NIFA Region 8 Website for updated information: www.region8water.org

COLORADO
Colorado State University
Soil and Crop Sciences
1170 Campus Delivery
Fort Collins, CO 80523-1170
(970) 491-4923
troy.bauder@colostate.edu

MONTANA
Montana State University
Land Resources and Environmental Sciences
Montana State University
Bozeman, MT 59717-3120
(406) 994-7381
asigler@montana.edu

NORTH DAKOTA
North Dakota State University
Agriculture & Biosystems Engineering
Department 7620
PO Box 6050
Fargo, ND 58108-6050
(701) 231-7239
thomas.scherer@ndsu.edu

SOUTH DAKOTA
South Dakota University
Agriculture & Biosystems Engineering
Ag Engineering Room 213
Brookings, SD 57007
(605) 688-5678
dennis.todey@sdstate.edu

UTAH
Utah State University
Watershed Sciences
5200 Old Main Hill
Logan, UT 84322-5200
(435) 797-7541
nancy.mesner@usu.edu

WYOMING
University of Wyoming
Department of Renewable Resources
Box 3354
Laramie, WY 82071-3354
(307) 766-2200
gpaige@uwyo.edu

APPENDIX B

FAQs

How do I choose a lab to contact and what kind of contract should be developed?

Inquire with local agencies that do water quality work for lab suggestions. Appendix G lists the contact information for the state certification officers for drinking water laboratories. Contact them to get an up-to-date list of certified labs in your state. Contact labs in your area and shop around, see which lab you would like to work with. See Step 1 of "Steps to Starting a Well Test Program" for components to include in your agreement.

Who puts the well test kits together? Where do I get all of the materials for the kits?

The coordinator will assemble the test kits. The testing lab should provide sample bottles and possibly the pre-addressed mailing envelopes if samples will be shipped to the lab. The coordinator will need to prepare and print the paperwork to accompany the sample bottles. Examples of the materials included in the MT program test kits are included in the appendices of this document.

What type of instructions/information materials should be included in the test kits?

Test kits should include some type of sample tracking form or registration sheet. This may take the place of a traditional chain of custody form typically required by a testing laboratory. Sample instructions should also be included. See the appendix for examples of materials used for the MT program. The clearer the information in the test kits, the fewer questions you will receive and this will save time. You may also want to include information about water quality parameters to help participants decide what to test for (example in appendix).

When should I offer the Well Test program?

A program can be offered at any time of year. If you have a specific target audience, you may try to plan the program when they are least busy. Spring is a common time to offer well testing programs and groundwater awareness week in March is a possibility. Spring is also a time when bacterial contamination of wells often occurs if snowmelt carries surface water into shallow groundwater or unprotected well heads.

How should the kits be distributed?

Kits should be available for pick up at a location that holds regular business hours. Kits can also be handed out at events see section 5, "Distributing Well Kits."

How will participants get results and how long will it take?

This will be determined by how you set up your program. See section 7, "Delivering Results to Participants" for further information. On average, participants can expect to see results in around two weeks. Some labs however, take 3-4 weeks to send results.

How will the samples get to the lab?

This will be determined by how you set up your program. Participants may mail or deliver samples directly to the lab depending on lab location. Another option is to have participants drop off their samples on a specific day at a specified location and then the coordinator can deliver or mail the bulk samples to the lab.

What are the costs associated with running this program?

Costs will vary with how you decide to set up your program. Examples of costs from two Colorado programs are included in the appendices. If participants are paying for analysis, the primary costs are personnel time and material printing. If results are mailed to participants, those costs should be considered as well.

What type of time commitment does the program require?

This will depend on how you structure your program and how many participants you reach. A well-organized program with clear, concise and informative materials will help reduce time spent answering questions.

Who answers well owners questions?

Factsheets, interpretive guides, videos, and informational folders are all provided to help well owners understand their test results and their water systems. These materials should answer most questions that participants might have. If questions come up that are not addressed in the materials, county health departments and state water quality coordinators are good additional resources.

What do I do with the data?

In the simplest case you might just keep the data on file to help answer future questions that arise about groundwater quality in your area. You may try to enter the data into a state water quality database if one is available or start your own database. If you have access to GIS software, creating maps of water quality can be very effective educational tools. See section 8, “Compiled Results” for more information.

APPENDIX C

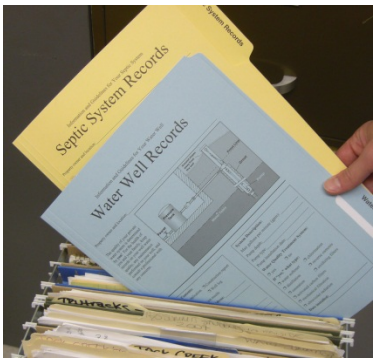
Example: Montana's Well Test Program

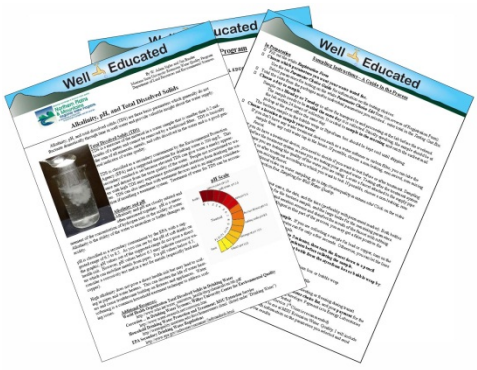
(State Wide Program)

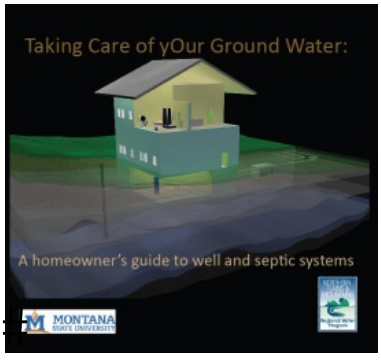
Overview:
MSU Extension Water Quality (MSUEWQ) puts together test kits and mails them to facilitators in participating counties. Facilitators advertise the program locally and participants pick up Well Educated test kits from the local office. Each test kit includes an introduction letter, a registration sheet, sampling instructions, a glossary of water parameters, information on finding a well log online, a 100 mL bottle for the bacteria sample and a 500mL bottle for other parameters. The participants fill out the registration sheet and choose the parameters they wish to have analyzed. Participants sample their well water and mail the bottles and registration sheet in a pre-addressed envelope directly to the participating lab with payment. The lab processes the water samples, emails the results to MSUEWQ and mails the registration sheets to MSUEWQ. MSUEWQ uses addresses provided by participants on the registration sheets to mail lab results, interpretive guides, factsheets, folders, and DVDs to participants.

Test Kits

Results and Interpretive/Educational Materials for Participants







APPENDIX D

Program Examples: COLORADO

Colorado: El Paso County (Local Program)

# of wells tested: **150**

Parameters tested: **Bacteria and a wide variety of chemical parameter choices**

Cost of program:

Water Testing Fees/Postage 150 tests	$1,500
Meeting Expenses	$ 250
Advertising and Outreach Materials	$ 340
Cost incurred by participants for testing	$1,500
Total	**$3,590**

Summary:

Sample bottles were distributed to well owners at a workshop held at the county Extension office and at a booth at the county fair. Participants sampled and returned samples to the Extension office where they were collected along with half of the analysis cost and were then delivered to the lab. The lab distributed results both to the participants and to the county Extension office. Results were mapped by the county GPS department to aid in public education efforts using webpages, newspapers, and fact sheets.

Colorado: Chaffee, Park, and Teller Counties (Local Program)

# of sample kits distributed: **65**

Cost of program:

Travel Expenses	
600 miles @ $.39	$234
Refreshments (coffee, tea, cookies, etc.)	$70
Handouts for participants, photocopying	$250
Postage, envelopes for evaluations	$80
Total	**$634**

Summary:

Test kits were distributed to well owners at a series of 5 workshops across the three counties. Educational materials were distributed and emphasis was placed on the educational benefits of the program. Results were distributed from the lab directly to the participating well owners but not to the county in all cases.

List of State Certification Officers for Drinking Water Laboratories by State

Check the EPA website for updated information at:
http://water.epa.gov/scitech/drinkingwater/labcert/statecertification.cfm#c

COLORADO
(303) 692-3681
Department of Public Health and Environment
Lab Certification Unit
8100 East Lowry Blvd.
Denver, Colorado 80220

MONTANA
(406) 444-2642
DPHHS Environmental Laboratory
1400 Broadway Rm. B-219
Helena, MT 59620

NORTH DAKOTA
(701) 328-6140
North Dakota Department of Health
Laboratory Services Division
P.O. Box 5520
Bismarck, ND 58502-0937

SOUTH DAKOTA
(605) 773-3754
Department of Environment & Natural Resources
Joe Foss Building
523 E. Capitol
Pierre, South Dakota 57501-1700

UTAH
(801) 584-8469
Utah Dept of Health
Division of Laboratory Services
46 North Medical Drive
Salt Lake City, Utah 84113-1105

WYOMING
(303) 312-6020
Drinking Water Laboratory Certification Officer
U.S. EPA Region VIII
1595 Wynkoop Street
Denver, Colorado 80202

APPENDIX F

Well Educated

Introduction to the Program

Dear **WELL EDUCATED** Program Participant,

My name is Katie Kleehammer and I am administering this year's **WELL EDUCATED** program from Montana State University in Bozeman. Thank you for participating!

You should have received:

- Program Introduction/Sampling Instructions (this blue sheet)
- 1 Registration Form/Parameter Choice List (a white sheet)
- 1 Parameter Choice Guide (a tan sheet)
- 1 GWIC: How to find your well log and GWIC Id (a green sheet)
- 1 small sample bottle in bubble wrap or Styrofoam box
- 1 larger sample bottle

} **Both Bottles Need to be Filled**

- 1 pre-addressed sample mailing envelope to Energy Laboratories in Billings

Choices for Sharing your Data

The information you will receive through testing your ground water is not only very important for your peace of mind but can also be a useful tool for local Extension Agents and health departments. On your registration form, there is a place for you to select if and how you would like to share your results.

1. **Sharing your results with your county agent and/or sanitarian** – We simply forward a copy of your results to the county office.
2. **Sharing your results on a map** - Using approximate latitude/longitude coordinates for your well, a water quality map can be created for the county. This map would not have any names or addresses attached. These maps will be created if a sufficient number of people from each county choose this option. Google Earth is a great resource to find the coordinates of your well. Contact your county facilitator or myself for information on finding your latitude/longitude.
3. **Sharing your results in an online database** - Montana Bureau of Mines and Geology (MBMG) Ground Water Information Center (GWIC) administers an online database listing almost all wells in Montana. Wells are usually filed under the last name of the person who owned the property when the well was drilled. You and/or your county agent may be able to find your well in the database and get the GWIC Id for your well. If you include this Id on your registration form, it will be possible to add your results to the GWIC database. Your GWIC Id will be located on your well log. This data is a valuable asset for researchers and planners trying to better understand Montana's precious water resources. To find the GWIC database on the web go to http://mbmggwic.mtech.edu/ If you are interested in sharing your results in GWIC but are unable to find your GWIC Id, you can still opt to share your data, and we will try to find your GWIC Id.

If you have any questions about the program, please feel free to contact

Contacts:	**Katie Kleehammer**	**Adam Sigler**
By email at:	kkleehammer@montana.edu	asigler@montana.edu
By phone at:	406-994-7381	
By post at:	Land Resources and Environmental Sciences Montana State University, Leon Johnson Hall 334 P.O. Box 173120 Bozeman, MT 59717-3120	

Flip this sheet over for a program check list and sampling instructions.

Well Educated

Sampling Instructions – A Guide In the Process

In Preparation

Fill out the white ***Registration Form***

Choose which parameters you want your water tested for.

Use the tan ***Parameter Choice Guide*** for information on the testing choices.

Select parameters for testing on the white ***Parameter Choice List*** form (on reverse of Registration Form).

Total the costs from the packages and/or individual parameters you selected - enter total in the ***Testing Cost Box***

Choose a day to sample.

Sample on a **Monday or Tuesday** to allow for transport to and processing at the lab before the weekend.

The sample needs to be **mailed the same day** it is collected. Strictly speaking, the sample should be at the lab within 24 hours of collection. It is ideal to **sample in the morning** and catch the earliest mail pickup at the post office the same day.

The bacteria sample in the bubble wrap or Styrofoam box should be kept cool until shipping.

Choose a location to sample your water.

If you don't have any water treatment devices such as a water softener or carbon filter, you can take the sample from any cold water tap in the house. If possible, choose a non-leaking, non-swivel, non-mixing faucet.

If you do have a treatment device, you need to decide if you want to test before or after treatment. Sampling before the treatment system means you are testing your ground water. Testing after the treatment system means you are testing the quality of the water you are using. Locate a faucet attached to the supply pipe before or after treatment according to which you want to test. If possible, choose a non-leaking, non-swivel, non-mixing faucet.

To view an instructional video on water sampling, go to http://waterquality.montana.edu/ Click on the video icon, and watch section four *Sampling for Well Water Quality*.

The Morning you Sample

Label the two bottles with your name, the date, and the time (preferably with permanent marker). Both bottles need to be filled, the small bottle for the bacteria sample, and the large bottle for the remaining parameters.

Remove any faucet attachments and aeration screens and disinfect the mouth of the faucet with rubbing alcohol or bleach. If you are not diligent in this part of the process, you may get a false positive for coliform bacteria.

Use the larger bottle to collect the first sample. If you are collecting a sample for lead or copper, turn on the water and collect the sample after letting the water run for only a few seconds. Otherwise, you can let the lines flush for 2 to 3 minutes before collecting the sample.

For the bacteria sample, let the water run for 2 to 3 minutes, then turn the faucet down to a pencil size stream of water. Let it run for an additional 2 minutes before colleting the sample.

The bacteria sample should be collected in the smaller bottle from the styrofoam box or bubble wrap by:

Breaking the seal on the bottle

Fill the bottle to the neck, do not rinse the bottle

Replace the lid firmly and place the bottle back in the styrofoam box or bubble wrap

CAUTION:

Be very cautious not to touch the inside of the lid or threads on bottle

The white powder needs to stay in the bottle to preserve the sample

The styrofoam box or bubble wrap insulates the sample from overheating or freezing during transit

Place the **sample bottles**, the **completed registration form**/**parameter choice list**, and your **payment** for the amount in the **Testing Cost Box** – in the pre-addressed mailing envelope. Payment is to Energy Laboratories Inc. Samples received at the lab without payment will not be tested.

Seal the envelope and mail it the same day. (US Postal Service 1st Class is recommended)

After the lab processes your samples, results will come to me at MSU Extension Water Quality. I will include materials to help you interpret your results along with information on the parameters you selected and send your results to you. Allow **at least 2 weeks** for your results.

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Parameter Choice List

(parameter = something in the water, chemical, bacteria, etc)

Step 1 - Check the box next to the parameter package/s you would like your water tested for (1-7).
Step 2 - To add additional parameters from the right column, check box 8 then check the individual parameters in the right column.
Step 3 - Total the cost of your package, any individual parameters from the right column, and the additional $2.00 administrative fee. Write the total in the **"Testing Cost"** box. Use the included "Parameter Choice Guide" for more information.

Parameter Packages

☐ **1) Basic Domestic Analysis ($$)**

- Alkalinity
- Bacteria (coliform + *E. coli*)
- Nitrate + Nitrite as N
- pH
- Total Dissolved Solids

☐ **2) Full Domestic Analysis ($$)**

- Alkalinity
- Aluminum
- Bacteria (coliform + *E. coli*)
- Calcium
- Chloride
- Conductivity
- Corrosivity
- Fluoride
- Hardness
- Magnesium
- Manganese
- Nitrate + Nitrite as N
- pH
- Potassium
- Sodium
- Sulfate
- Total Dissolved Solids
- Zinc

Suitability of Water for Livestock and Classification of Water for Irrigation included with this test at no additional charge.

☐ **3) Total Iron Analysis ($$)**

☐ **4) Basic Annual Analysis ($$)**

- Bacteria (coliform + *E. coli*)
- Nitrate + Nitrite as N

☐ **5) Select Inorganic Analysis ($$)**

- Arsenic
- Cadmium
- Copper*
- Lead*
- Selenium

☐ **6) Suitability of Water for Livestock ($$)**

- Molybdenum
- Sodium
- Nitrate + Nitrite as N
- Selenium
- Sulfate
- Total Dissolved Solids (TDS)

☐ **7) Classification of Water for Irrigation ($$)**

- Calcium
- Conductivity
- Magnesium
- Sodium
- Sodium Adsorption Ratio

☐ **8) I have Selected Additional Individual Parameters in the right column. ($_____)**

* lead and copper require first draw sampling, see instructions

Remember to add the cost of each test in the parenthesis

Individual Parameters

Inorganic parameters which occur naturally

☐ Antimony ($$)
☐ Arsenic ($$)
☐ Barium ($$)
☐ Beryllium ($$)
☐ Cadmium ($$)
☐ Chromium ($$)
☐ Copper* ($$)
☐ Lead* ($$)
☐ Mercury ($$)
☐ Nitrate + Nitrite as N ($$)
☐ Selenium ($$)
☐ Thallium ($$)
☐ Uranium ($$)

If you have selected additional individual parameters from this list, make sure you have checked box 8 in the left column.

Testing Cost

Total your parameter package cost with any individual parameters you selected. Write the total here. **Add $2.00 for administrative fees.**

Cost **$_____**
Plus **$2.00**
Total Cost **$_____**

Include payment for this amount with your samples. Please make check payable to "Energy Laboratories Inc."

Step 4 - Please fill out your mailing address on this label to help us mail your results.

For more information on Drinking Water Standards check the EPA website at http://www.epa.gov/safewater/mcl.html#mcls

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Tracking # Sticker

Registration Form

For Lab Use
Sample ID:
Date Sample: Date Received:
Temp: Check #:
Notes:

A) Last Name: **First Name:**

For Office Use Only **B) Well Code:**
(leave blank if this is the first time the well has been tested)

C) Are you submitting multiple sets of samples? (*both bottles from the kit = 1 set*) ☐ Yes ☐ No If yes, how many _____
If submitting multiple sets of samples, write a 5 word description for this sample: _____

D) Mailing Address for Results:

Zip code:

E) Physical Address of Well: (write NA if same as mailing)

Zip code:

F) Phone Number

G) County Well is In

H) email address: _____

I) May we share your results with your county extension agent and/or sanitarian? ☐Yes ☐No
J) Would you like your results included on a map of water quality in your county? ☐ Yes ☐ No
(MSUEWQ or the county office can help you find these coordinates.)
K) Location of Well *(decimal degrees)* **- Lat** _ _ . _ _ _ _ _ _ ° **Long** _ _ _ . _ _ _ _ _ _ ° or Township___ Section____ Range____
L) Method used to find latitude and longitude Google Earth ☐ GWIC ☐ GPS ☐ Datum NAD83 or NAD27

M) Are you interested in sharing your results in Montana Bureau of Mines and Geology's online database? ☐ Yes ☐ No
N) If Available, enter GWIC Id here _____
(GWIC instructions included. You can opt to share data without providing your GWIC code and/or call MSWEWQ for help 994-7381)

The following questions will help us understand more about you and your ground water needs to better interpret your results..
Please check the box next to the best response, and fill in the blanks below.

O) How would you classify the area your property is in? ☐ Urban ☐ Sub-Urban ☐ Rural

P) How large is the property your well is on?

☐ Less than 1 acre ☐ 1-10 acres ☐ 10-50 acres
☐ 50-250 acres ☐ 250-1,000 acres ☐ More than 1,000 acres

Q) What is the predominant land use on your property?
☐ Residential ☐ Farm ☐ Other_____
☐ Livestock Related Operation
R) Approximately how many livestock (or head) are on the property? _____

S) Are you aware of any inactive wells on your property? ☐ Yes ☐ No
T) Are they properly sealed to protect your ground water? ☐ Yes ☐ No ☐ Not Applicable ☐ Not sure

U) What is the primary use for the well you are testing?
☐ Household and Garden Water ☐ Irrigation ☐ Livestock Watering ☐ Other

V) Do you use water from this well as your primary drinking source? ☐ Yes ☐ No

W) Do you currently treat your well water before drinking? ☐ Yes ☐ No
X) Are you sampling your water before or after the treatment system? ☐ Sample is Untreated ☐ Sample is Treated ☐ NA

Y) Have you ever had the water quality tested in this well before? ☐ Yes ☐ No ☐ Not sure
Z) Have you tested this well in the Montana Well Test program before? ☐Yes ☐No If yes, what year_____

AA) What is the Approximate age of your well (or home if you don't know well age)?
☐ Less than 2 years ☐ 2 to 5 years ☐ 5-15 years ☐ 15-30 years ☐ More than 30 years

BB) What is the depth of your well?
☐ Less than 50 feet ☐ 50-150 feet ☐ 150-300 feet ☐ Greater than 300 feet ☐ Not Sure ☐ Source is not a well

CC) Are you familiar with the function of your well, and do you feel confident that you understand all the necessary maintenance and safety procedures to protect your ground water?
☐ Yes, I understand well function, maintenance and safety procedures.
☐ No, I feel like I could know more about maintaining my well and protecting my ground water.

DD) Is your household on a septic system? ☐ Yes ☐ No ☐ I don't know
EE) Have you ever had your septic system pumped? ☐ Yes ☐ No ☐ I don't know ☐ No Septic

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Parameter Choice Guide

Modify this choice guide to include all of the tests available to your participants and include the price of each test

1) Basic Domestic Analysis ($$): basic test for people who haven't tested in recent years or ever

Alkalinity, Bacteria (coliform + E. coli), Nitrate + Nitrite as N, pH, Total Dissolved Solids (TDS)

2) Full Domestic Analysis ($$): fairly comprehensive inventory of water quality covering critical bacteria and nitrate as well as a broad group of parameters effecting aesthetic and nutritional quality of water (tooth discoloration, taste, smell, staining, corrosive, and scaling properties)

Alkalinity, Aluminum, Bacteria (coliform + E. coli), Calcium, Chloride, Conductivity, Corrosivity, Fluoride, Hardness, Magnesium, Manganese, Nitrate + Nitrite as N, pH, Potassium, Sodium, Sulfate, Total Dissolved Solids (TDS), Zinc

3) Total Iron Analysis ($$): iron testing may be desirable to explain brown-red staining especially if iron treatment is being considered. Iron discoloration accompanied by slime may indicate iron bacteria. A test sample bottle for iron bacteria is available upon request from the lab.

Iron

4) Basic Annual Analysis ($$): minimum test all private well owners should complete every year, parameters can pose health risks and are good basic indicators of water quality to track through time.

Bacteria (coliform + E. coli), Nitrate + Nitrite as N

5) Select Inorganic Analysis ($$): parameters posing considerable health risks, which also may occur in Montana ground water

Arsenic, Cadmium, Copper, Lead, Selenium

6) Suitability of Water for Livestock ($$): test of basic parameters which can deter livestock from drinking and/or cause health or performance issues

Nitrate, Sulfate, Total Dissolved Solids, Molybdenum, Selenium, and Sodium

7) Classification of Water for Irrigation ($$): parameters which can inhibit crop growth and/or impact soil quality

Calcium, Conductivity (estimates total dissolved solids), Magnesium, Sodium, Sodium Adsorption Ratio

8) Individual Parameters ($$): a selection of inorganic parameters which can be tested for individually, that occur naturally and can pose health risks

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nitrate, Selenium, Thallium, Uranium

see other side

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Parameter Glossary

Bold text indicates a parameter which poses a health risk. Regular text indicates a parameter which does not pose a health risk but may impair aesthetic quality.

Alkalinity -	The ability of water to buffer changes in pH. Higher alkalinity means water is less likely to experience big changes in acidity.
Aluminum -	A naturally occurring metal which can produce color in water.
Antimony -	**A naturally occurring metal which can cause cholesterol and blood sugar problems.**
Arsenic -	**A naturally occurring nonmetal which can cause skin damage, circulatory problems, and increased risk of cancer.**
Bacteria -	**(Coliforms + *E. coli*) should be tested annually to detect contamination from human or animal feces, or problems with the seal on your well.**
Barium -	**A naturally occurring metal which can cause increased blood pressure.**
Beryllium -	**A naturally occurring metal which can cause intestinal lesions.**
Cadmium -	**A naturally occurring metal which can cause kidney damage.**
Calcium -	A naturally occurring metal which is an essential nutrient in the human diet and is the primary contributor to the hardness of water.
Chloride -	A common natural salt in ground water which can impart a salty taste; high quantities can cause gastrointestinal distress in people unaccustomed to the water.
Chromium -	**A naturally occurring metal which can cause allergic skin inflammation.**
Copper -	**Is a naturally occurring metal, but in water systems typically comes from pipes. May give water a metallic taste and cause blue-green stains on sinks or fixtures, and can cause liver or kidney damage after long term exposure when over the drinking water standard.**
Fluoride -	**A naturally occurring nonmetal which promotes dental health at appropriate concentrations but can cause tooth discoloration and bone disease at high concentrations.**
Hardness -	Primarily caused by compounds of calcium and magnesium in water and can result in scaling in pipes/water heaters; it also decreases the lather and effectiveness of soaps and detergents.
Iron -	A naturally occurring metal which is an essential nutrient in the human diet but can give water a metallic taste and cause red-brown stains on fixtures or clothing at high concentrations. Iron bacteria may also be present which does not pose health concerns but my cause aesthetic issues.
Lead -	**Is a naturally occurring metal, but in water systems typically comes from pipes. May retard development in children and cause blood pressure and kidney problems in adults.**
Magnesium -	A naturally occurring metal important in human diet which contributes to the hardness of water.
Manganese -	A naturally occurring metal essential in the human diet which can give water a bitter taste and cause black staining on fixtures or clothing at high concentrations.
Mercury -	**A naturally occurring metal which can cause kidney damage.**
Nitrate -	**Can occur naturally, from septic tanks/wastewater treatment, or from agricultural practices and causes oxygen deficiency in infants under 6 months of age; nitrates move easily in ground water so increasing nitrate levels can be an early warning that other contaminants are moving toward a well. However, a low nitrate value does not mean other contaminants are absent from your water.**
pH -	The measure of acidity of water. As pH values move away from 7 (below 6.5 or above 8.5) metals in the soil or water pipes may be released into the water.
Potassium -	A common salt in ground water and essential in the human diet but can impart a salty taste; high concentrations can cause gastrointestinal distress in people unaccustomed to the water.
Selenium -	**A naturally occurring nonmetal which is essential in the human diet at low concentrations but can cause problems with skin and hair, numbness in fingers and toes, or circulatory problems at high concentrations.**
Sodium -	A common salt in ground water which can impart a salty taste; sodium contributes to hypertension and high quantities can cause gastrointestinal distress in people unaccustomed to the water.
SAR-	(Sodium Adsorption Ratio) amount of sodium relative to calcium and magnesium in water; high SAR can damage soil and reduce crop productivity.
Sulfate -	A common salt in ground water which can impart a salty taste; high quantities can cause gastrointestinal distress in people unaccustomed to the water.
Thallium -	**A naturally occurring metal which can cause hair loss; changes in blood; kidney, intestine, or liver problems.**
TDS -	(Total dissolved Solids) is the sum of all minerals dissolved in water.
Uranium -	**A naturally occurring radio active element which can cause cancer as well as have toxic effects on the kidneys.**
Zinc -	A naturally occurring metal essential to the human diet which can give water a metallic taste at high concentrations.

Well or Septic System Questions?

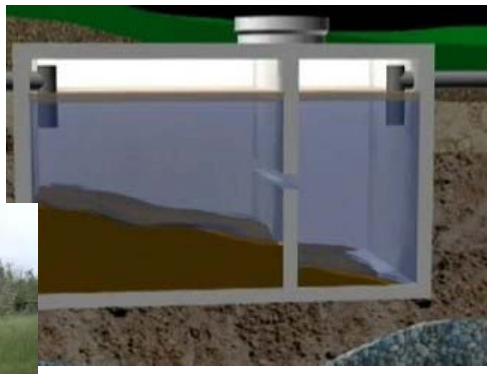
Find answers in this new educational DVD for Well and Septic Owners

Taking Care of yOur Ground Water:
A homeowner's guide to well and septic systems

The main film is about 16 minutes long and uses 3D graphics, footage, and interviews to illustrates how private well and septic systems work and how they are connected to the water cycle.

Supplemental chapters include:

1. Protecting the Wellhead (10:25)
2. Septic System Function and Maintenance (9:30)
3. Water System Considerations for Buying or Building a New Home (10:11)
4. Sampling for Well Water Quality (6:25)
5. Interpreting Water Quality Results (8:35)
6. Chlorinating a Well and Water System (9:27)
7. Water Treatment Basics (6:38)
8. Bloopers (3:41)



Videos available from:

MSU Extension Publications for $4 a copy
Email: orderpubs@montana.edu
(406) 994-3273
www.msuextension.org/publications.asp
Viewable on the web at - http://waterquality.montana.edu/

Applying knowledge to improve water quality
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