RAM Program Manual

rest area maintenance

8.0 WELL & WATER INFO

8.0 WELL WATER TESTING

8.1 INTRODUCTION

8.2 WHO DO I CALL FOR INFORMATION

8.3 WHAT ARE THE DNR'S RESPONSIBILITIES

8.4 WHAT ARE YOUR RESPONSIBLITIES

8.5 COLLECTING WATER SAMPLES

8.6 WHAT SAMPLING IS REQUIRED

8.7 WHAT TO DO IF SAMPLE CONTAINS BACTERIA

8.8 WATER TESTING STANDARDS

8.9 PUBLIC NOTIFICATION

8.10 PUBLIC NOTICE--MISSED WATER SAMPLE

8.11 PUBLIC NOTICE--TOTAL COLIFORM MCL VIOLATION

8.12 PUBLIC NOTICE--FECAL/E.COLI ACUTE MCL VIOLATION

8.13 DRINKING WATER ADVISORY HIGH NITRATE LEVEL

8.14 HAND PUMP SYSTEM STARTUP, PRE-SAMPLING PROCEDURES

8.15 ELECTRIC AND SOLAR WELL PUMP ASSEMBLIES OPENING AND CLOSING PROCEDURES

Well Water Testing

A. INTRODUCTION

As an owner/manager of a public water supply system, your job is to provide safe water to all users. Preventing contamination and planning for future system needs will help you accomplish this.

Wisconsin's Department of Natural Resources (DNR) oversees construction and operation of public water systems to make sure water is safe to drink and use. However, as legal manager of the water system, it is your job to monitor drinking water quality. The following information will help you develop, assess, and maintain a quality water supply. A copy of the information contained in this section is available on the DNR website at the following address:

http://dnr.wi.gov/topic/drinkingwater/

You can also request a copy of the "Owner/Operators Handbook For Safe Drinking Water" from the DNR by calling 608-267-2451.

B. WHAT ARE THE SAFE DRINKING WATER REQUIREMENTS AND WHERE DO THEY COME FROM

The Safe Drinking Water Act (SDWA) of 1974 is a federal law that sets health and safety standards for public drinking water in the United States. It was the nation's first comprehensive drinking water law. Under the law, the U.S. Environmental Protection Agency (EPA) sets national standards for drinking water quality. All states must meet these standards. In 1996, Congress passed the first amendments to the SDWA in 10 years. Their focus was to prevent contamination of public water supplies. They also strengthened public health protection, and allowed for increase public involvement. Transient non-community water systems will be affected by these amendments. Information is available through the DNR, as well as other sources.

C. WHAT SYSTEMS ARE REGULATED BY THE SAFE DRINKING WATER ACT

The Safe Drinking Water Act governs *public* water systems. Both EPA and DNR define a public water system as one that provides water for human consumption through piping and provides water to at least 15 service connections. Or, it regularly serves an average of at least 25 people daily for at least 60 days per year. There are four types of Public Water Systems in Wisconsin. They are municipal, other-than-municipal, non-transient non-community, and transient non-community water systems.

The Wisconsin Department of Transportation Rest Area Maintenance sites are classified as Transient non-community systems (TN). These water systems serve at least 25 people at least 60 days of the year. They do not serve the same 25 people over 6 months of the year. Other examples of these systems include motels, restaurants, parks, taverns, churches, and gas stations.

Note: The word "serve" means that water is available for serving, not that people are necessarily known to drink the water.

Who Do I Call For Information?

A. The DNR has five regional offices statewide to serve you. Call the nearest one to talk to a drinking water specialist assigned to your county. They can answer your water system questions. Refer to Section 3.7 for regional office addresses and phone numbers. The DNR Drinking Water Staff directory is also found on the Internet at: https://dnr.wi.gov/topic/drinkingwater/

Water Supply Specialist
Division of Water
Drinking Water and Groundwater
Public Water Supply Section

Carol Bentzler
WI Dept. of Natural Resources
DG-2
P. O. Box 7921
Madison, WI 53707-7921
(608) 267-2451

Refer to Section 3.7 in this manual for DNR Regional Drinking Water and Groundwater contacts.

What is the Wisconsin Department of Natural Resources' responsibility?

The Department of Natural Resources oversees the Safe Drinking Water Act for Wisconsin. DNR works with water supply systems to protect the health and welfare of users, and to protect our state's water resources. Below is a list explaining DNR's duties.

A. APPROVALS

DNR staff approves plans for water treatment.

B. TECHNICAL ASSISTANCE

DNR Drinking Water Specialists help public well operators on compliance issues for the SDWA. *The Department is working towards establishing good working relationships with systems to help prevent compliance problems before they occur.*

C. INSPECTIONS

DNR staff inspects water systems to evaluate them for the risk of contamination, well code compliance, and to ensure the well and pressure system are in good sanitary condition. The technical, managerial, and financial ability of public water systems to provide safe drinking water consistently and cost-effectively will also be evaluated.

D. ENFORCEMENT

DNR staff enforces both state SDWA regulations so that all systems are in compliance with drinking water quality and water system installation regulations.

What are Your Responsibilities?

You must provide drinking water that meets state and federal drinking water standards. A table listing Maximum Contaminant Levels (MCLs) can be found in Section 8.8 of this manual. The basic requirements include:

A. SAMPLING

Annual samples must be taken for bacteria & nitrate. A small number of Transient systems sample quarterly for bacteria and nitrate. A one-time nitrite sample is required. Although in cases where nitrite levels are elevated, more frequent nitrite samples may be required.

1. Most Transient non-community water systems receive sampling kits annually from the DNR usually between January and May. Sampling lab slips are sent to facilities that use a lab other that the State Laboratory of Hygiene. After you get the kit, you should sample as soon as possible to meet the Safe Drinking Water Act requirements. Please mail your samples **within two weeks** of receiving the sampling kit, so that the mailer may be used again for another water system. Everyone benefits from the cost savings realized by reusing the sample kit mailers.
2. If you do not receive a test kit during this timeframe, please contact Carol Bentzler at 608-267-2451 or Penny Hisel at 608-267-2468 from the DNR.

B. ADDRESS CHANGES

If your address changes, please contact the DNR at 608-267-2468. This will ensure the test kits are sent to the appropriate person.

C. SEASONAL SITES

Kits are usually mailed at least 30 days before you open. Take the water samples when the well is operating for the season, and if possible, 30 days **before** serving water to the public. If the kit does not arrive before you open, you can request a kit from the DNR by calling 608-267-2451.

D. WHERE TO SEND THE SAMPLE

If the State Laboratory of Hygiene performs the tests, results will be sent electronically to the DNR with a paper copy sent to you. If a private laboratory is used, **you must provide the laboratory with the DNR lab slip that is sent to you.** You are responsible for getting a copy of the test results to the nearest Regional DNR office (see map in Section 8.2). Keep a copy of test results for your own files! Water samples must be analyzed by the Wisconsin State Laboratory of Hygiene (see address below) or a laboratory certified to test for bacteria or other contaminants. **Be sure to contact other labs before sending them your water sample to ensure they except outside water samples.** A list of certified labs is available on the DNR website at the following address: http://prodoasext.dnr.wi.gov/inter1/pk_ws582_lablist$.startup

For samples sent by U.S. mail:
Environmental Health Division
Wisconsin DOT Water Sample
State Laboratory of Hygiene
PO Box 7996
Madison, WI 53707-7996
Tel: 608-244-6202 OR 800-442-4618

For samples sent by UPS:
Environmental Health Division
Wisconsin DOT Water Sample
State Laboratory of Hygiene
2601 Agriculture Drive
Madison, WI 53718

NOTE: PREPAID POSTAGE LABELS TO THE STATE LAB OF HYGIENE ARE AVAILABLE THROUGH THE DSPN OFFICE. PLEASE CALL 608-661-2914 TO REQUEST SOME.

E. WELL CONSTRUCTION

Ensure that your water system is built and maintained according to state standards. Non-community water well pump systems must meet construction standards of Wisconsin Administrative Code NR812, Well Construction and Pump Installation (Wisconsin Well Code). To meet these requirements, you should work with licensed water well or pump installation contractors before making modifications to your water system. You should also discuss plans with the DNR drinking water specialist in your area--see section 8.2 of this manual.

Transient non-community water systems must gain approval to install a water treatment device use to treat a health-related contaminant. Contact the DNR if you have questions about treatment approval requirements.

1. Maintenance--Maintain your water system in good sanitary condition to provide safe, dependable water supple.

2. Record Keeping--Keep copies of sampling results and inspection reports for your own records. You'll want these as a historical record. Records can also help prove you sampled in case there are reporting errors.

Collecting Samples for Bacteriological and Nitrate and Nitrite Tests

Step 1
Complete nitrate and bacteriological test request forms with a ballpoint or waterproof pen. Note: the sample cannot be processed without a collection date and time.

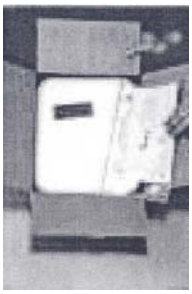
Step 2
Fill both bottles. For the bacteria sample, follow the standard sterilization and collection process outlined on the back of the bacteriological form. Securely tighten caps. Nitrate should be collected at the entry point and bacteria in the distribution system if possible. If both need to be collected from the same faucet the bacteria sample should be collected first.

Kit content:
- 2 bottles (1 for bacteriological test and 1 for nitrate test)
- 2 test request forms (1 for bacteriological test and 1 for nitrate)
- 2 small zip-lock bags (1 for each bottle)
- 2 large zip-lock bags (1 for ice & 1 for forms)
- 1 Styrofoam shipper with cardboard box

Step 3
Place each bottle in a small zip-lock bag. Place bagged nitrate bottle in one of the large zip-lock bags and fill at least 3 / 4 full with ice and seal.

Step 4
Place ice bag/nitrate bottle and bacteria bottle in the Styrofoam shipper. Do not tape Styrofoam lid.

Step 5
Place test request forms in second large zip-lock bag and place on top of styrofoam shipper.



Step 6
Close box so State Lab of Hygiene address label and "priority mail" sticker shows. Secure cardboard box with tape. Ship by priority rate* and mail on Monday, Tuesday or Wednesday only.

Wisconsin State Laboratory of Hygiene
Environmental Health
Division
2601 Agriculture Drive
P.O. Box 7996
Madison, WI 53707-7996
800-442-4618
or 608-224-6202

*** *Warning:*** The water sample must be analyzed within 48 hours of collection. In most cases, shipping by priority rate mail will meet this requirement. However, there may be areas of the state where a higher shipping rate is needed to meet this requirement. Check with your local post office for the proper delivery rate or use a different carrier to meet this requirement.

What Sampling is Required?

A. GENERAL SAMPLE MONITORING SCHEDULE FOR TRANSIENT NONCOMMUNITY SYSTEMS

The table below shows the major groups of drinking water contaminants. It also includes the minimum frequency that transient public water systems must test for them. If a contaminant is detected, you must follow retesting procedures and strict instructions for informing the public about the problem. Your DNR contact person will help you with a public notice. Retesting and public noticing is continued until the system can reliably show that it is free of contamination.

CONTAMINANT	MINIMUM MONITORING FREQUENCY	HEALTH RISKS
Bacteria	Annually, quarterly, or monthly, depending on system size and type.	Total cloriforms may indicate the presence of other diseases; symptoms include diarrhea, cramps, nausea, and vomiting.
Nitrate	Annually	May cause "baby blue syndrome" in infants, (shortness of breath, blueness of skin), birth defects, miscarriages.
Nitrite	One time	May cause "baby blue syndrome" in infants, (shortness of breath, blueness of skin), birth defects, miscarriages.

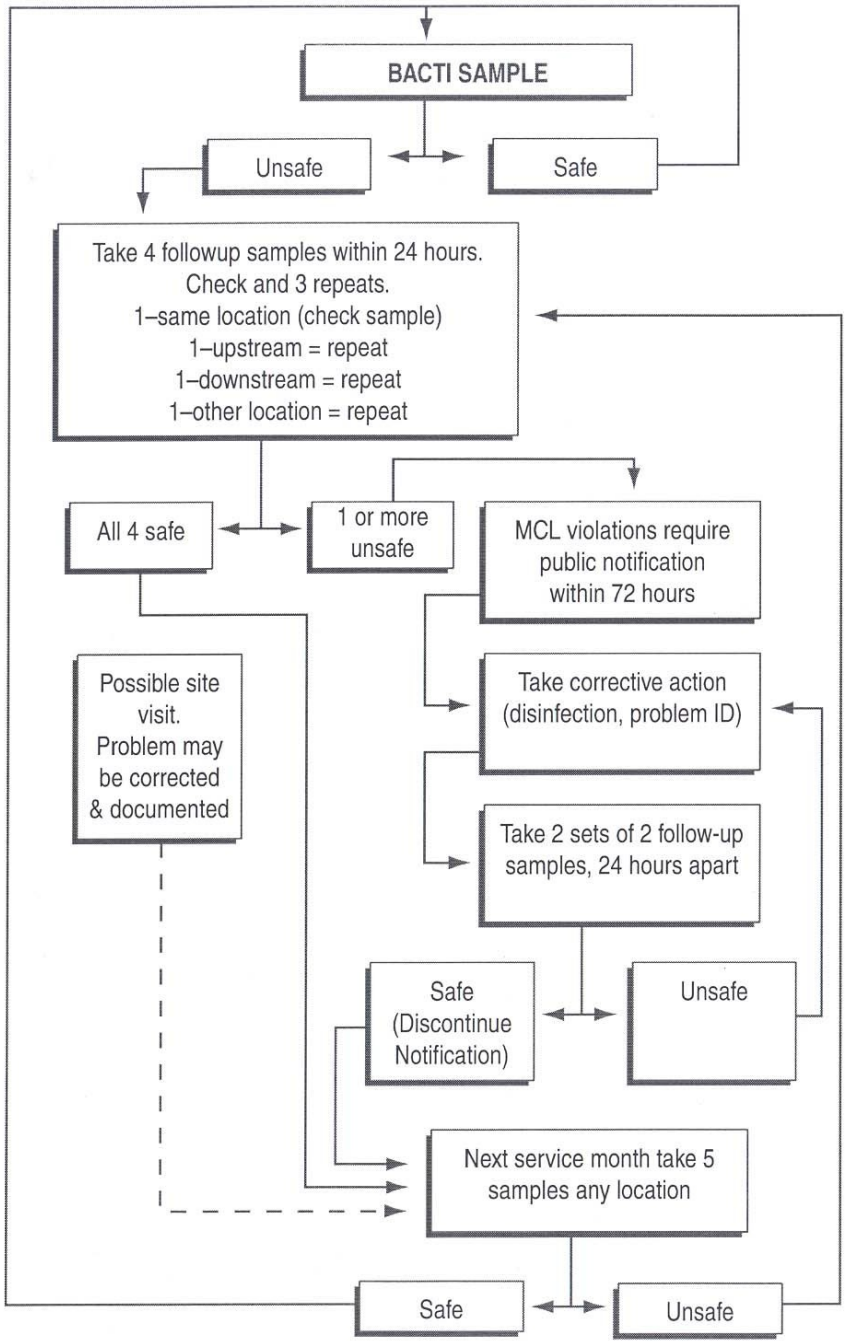
Water samples must be analyzed at a laboratory certified for Safe Drinking Water analysis. A list is available from the DNR, or on the web at http://dnr.wi.gov/regulations/labcert/lablists.html or by contacting your regional office.

B. WHAT HAPPENS IF I DON'T MONITOR CORRECTLY

Failure to monitor within the proper schedule or failure to submit the results to the DNR violates the monitoring and reporting provisions of the SDWA and Wisconsin Administrative Code NR 809, Safe Drinking Water Act Standards. You will be required to post a public notice, describing the violation.

See Section 8.7 for a flow chart of actions you must take if your bacteriological sample analysis comes back with coliform bacteria detected.

What To Do If Sample Contains Bacteria



Water Testing Standards

A. MAXIMUM CONTAINMENT LEVELS (MCLS)

The standards are called the Maximum Contaminant Levels (MCLs). MCL is the maximum allowable level of a substance that you can deliver to the customer in your water. The following table has the most recent levels available. MCLs can change with regulation changes, so if you're not sure or you have questions, contact a regional DNR Water Specialist or Program Assistant.

Maximum Contaminant Levels (MCLs)
For Drinking Water Contaminants

Contaminant	MCL
Regulated Compounds	
Bacteria	0
Nitrate	10 mg/L
Nitrite	1 mg/L

B. HOW WILL I KNOW WHEN MY WATER HAS EXCEEDED A MCL

A Safe Drinking Water Act certified laboratory must perform all of the analyses required by the state drinking water regulations. Certified laboratories will know if any of your analysis results exceeded an MCL, and they will notify you of the results. In addition, results of all analyses must be submitted to the DNR within 10 days of receipt from the laboratory. The DNR reviews your results and informs you of any violations and follow-up sampling needed. (See the table in Section 8.7 for follow-up procedures for an unsafe bacteria sample).

C. WHAT DO I DO IF MY WATER EXCEEDS A MCL

If your water exceeds an MCL, you must issue a public notice to users of the system. You must also take immediate action to return the drinking water to a safe condition. The degree of follow-up action depends on the type and amount of contamination. The Department of Natural Resources will work closely with you to determine the degree of follow-up necessary for your water system.

Public Notification

When an MCL is exceeded, you must notify the public water system users of the condition. Contact your regional DNR public drinking water staff right away for public notification instructions. The notification must contain at a minimum, the contaminant found and its level, health effects of exposure, measures being taken to alleviate the problem, and the name and telephone number of someone who can provide the consumer with more information. This notice must be posted at all drinking water outlets. The type of notification required will depend on the severity of the contamination, the type of population being served, and the urgency of the situation. The DNR will help you deter-mine what language to put in your notification.

Whenever you notify the public, make sure you forward a copy of that notification to your regional DNR drinking water staff person. The regional office staff working with your water system must be able to verify that notification was provided to customers in order for your system to be considered in compliance with this requirement.

A public notification rule handbook is available which outlines the public notification rules in an easy-to - read format and offers suggestions to systems on distribution options and includes a series of templates that apply to the most common violations for each type of system. It is available on-line at: https://www.epa.gov/ground-water-and-drinking-water .

IMPORTANT: In addition to posting public notifications of unsafe drinking water, assure that the water supply to all drinking fountains, jug fillers and coffee machines are turned off until safe water samples have been approved by DNR. Additionally, public notifications must be posted at restroom sinks as well as at drinking fountains and jug fillers.

PUBLIC NOTICE
MISSED WATER SAMPLE

In the interest of protecting your health, _____ (Service Provider) is required by state and federal law to routinely collect water samples for bacteriological analysis. These samples are tested for the presence of coliform bacteria. These bacteria do not typically cause disease; rather, they are used as indicator organisms. Results of microbiological sampling are used to determine the day-to-day safety of our water with regard to waterborne disease.

Because of the importance of this routine monitoring of the drinking water, we are required to notify our consumers whenever a sample is missed. We wish to inform you that a bacteriological sample was missed during the _____ (month) sampling period. The reason for this failure to collect the sample was _____ (reason) _____. A follow-up water sample was collected on _____ (date). This sample came back without any problems being detected.

We will be monitoring our water supply on a _____ (time period ex: 2 week) basis in the future. If you have any questions of this information, please feel free to contact:

Contact: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____

TOTAL COLIFORM MCL VIOLATION
(PUBLIC NOTICE)

In the interest of protecting your health,_____ is required
(Service Provider)
by State and Federal law to inform you of a violation of the maximum contaminates level for total coliforms. State and Federal law requires drinking water to be free of total coliform bacteria. Samples collected on_____ indicated the presence of total coliforms. Further sampling on
(day & date)
_____ confirmed their presence.
(day & date)

The United States environmental protection agency (EPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your coliforms to reduce the risk of these adverse health effects. Under this standard, no more then one total coliform-positive sample per sampling period can contain these bacteria. Drinking water which meets this standard is usually not associated with a health risk from disease-causing bacteria and should be considered safe.

State and local health authorities recommend consumers take the following precautions:_____

To insure the safety of your drinking water, we have done the following:_____

The cause of the contamination was due to:_____

If you have any questions or concerns, please contact:_____

FECAL/E.COLI ACUTE MCL VIOLATION
(PUBLIC NOTICE)

In the interest of protecting your health, _____ (Service Provider) is required by State and Federal law to inform you of a violation of the maximum contaminant level for total coliforms. We are also required to tell you if Fecal Coliforms or E. Coli are present in our water supply. State and Federal law requires drinking water to be free of total coliforms, Fecal coliforms, or E. Coli bacteria.

Samples collected on _____ (day & date) indicated the presence of total coliforms and _____ _____. Further sampling on _____ (day & date) confirmed their presence.

The United States environmental protection agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms and E. Coli is a serious health concern. Fecal coliforms and E. Coli are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria is generally a result of a problem with water treatment or the pipes which distribute the water, and indicates that the water may be contaminated with organisms that can cause disease.

Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and E.Coli to reduce the risk of these adverse health effects. Under this standard, all drinking water shall be associated with a health risk from disease-causing bacteria and should be considered safe. State and local health authorities recommend that consumers take the following precautions: (to be inserted by the public water system owner or operator according to instructions from the department).

State and local health authorities recommend that consumers take the following precautions:___

_____

_____

To insure the safety of your drinking water, we have done the following:_____

_____

_____

The cause of the contamination was due to:_____

_____

If you have any questions or concerns please contact:_____

Drinking Water Advisory

High levels of Nitrate in Drinking Water

This water has been found to contain nitrate levels that exceed federal and state standards

DO NOT GIVE TAP WATER FROM THIS FACILITY TO INFANTS. Babies less than 6 months old who drink high nitrate water can become seriously ill, and if untreated, may die. Symptoms are blue-grey skin color and difficulty breathing. Seek immediate medical care if your baby has these symptoms.

DO NOT PREPARE BABY FORMULA or other drinks for young infants with this tap water.

FEMALES WHO ARE OR MAY BECOME PREGNANT SHOULD NOT CONSUME THIS WATER. (Consumption means drinking the water or eating foods prepared with the water, such as soups, juices, and coffee.) There is some evidence of an association between exposure to high nitrate levels in drinking water during the first weeks of pregnancy and certain birth defects.

DO NOT BOIL THE WATER. Boiling concentrates the nitrate and increases the hazard. Filtering, freezing, or letting the water stand does not reduce the nitrate level.

USE BOTTLED WATER or water from a source known to be safe by testing.

TAP WATER IS SAFE FOR OCCASIONAL USE BY CHILDREN OLDER THAN 6 MONTHS AND PERSONS WHO ARE NOT OR MAY NOT BECOME PREGNANT. However, the Wisconsin Department of Health Services recommends people of all ages avoid *long-term* consumption of water that has a nitrate level greater than 10 milligrams per liter (mg/L).

A full public notice with detailed test results is posted on the premises. Ask management to direct you to the formal notice for more information, or for a brochure about nitrate or where to obtain safe water.

Start up Procedure for Hand Pump Systems

1. Install Pump handle.
2. The drainage system should be open and functioning properly to prevent ponding around the casing.
3. The concrete slab should not have any cracks; open spaces under the slab should be filled. Also, check sealant between well casing and concrete slab.
4. Tighten nuts and bolts as needed. Check gaskets, packing nut (tighten to 82 lb/in) and packing.
5. The pump stand and its major components should not be cracked or broken.

Pre-Sampling Procedure

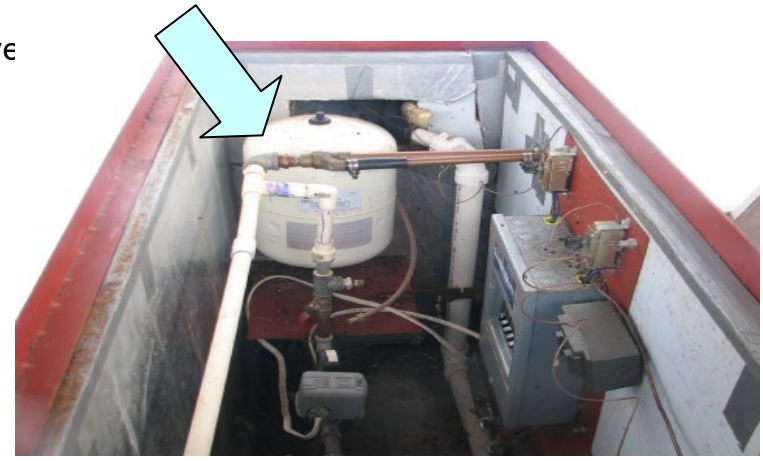
1. Using a 50/50 bleach/water mixture, wash all visible dirt and debris from the pump spout as far into the spout throat as you can.
2. Flame the spout lip and throat as far as can be reached.
3. Using a spray bottle (preferably with a curved or flexible wand) spray pure bleach into the spout throat as far as possible. Spray enough to thoroughly coat the throat of the pump.
4. Wait at LEAST 30 minutes.
5. Pump water out profusely.
6. Take samples as directed.

ELECTRIC & SOLAR SEASONAL WELL PUMP ASSEMBLIES

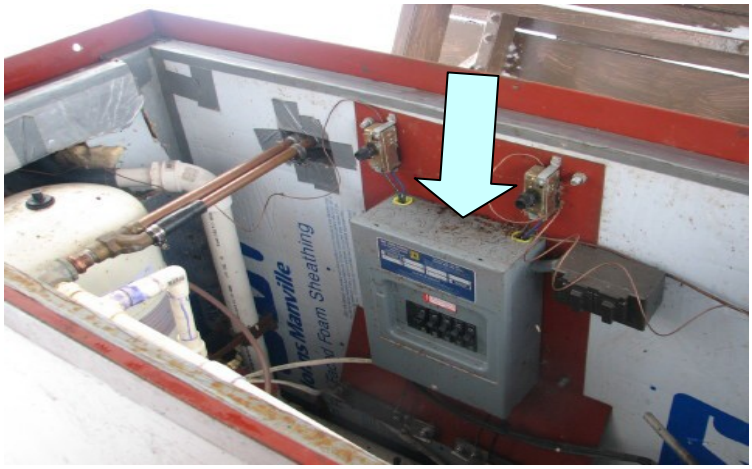
OPENING PROCEDURES

1. Close off well drainage valve.

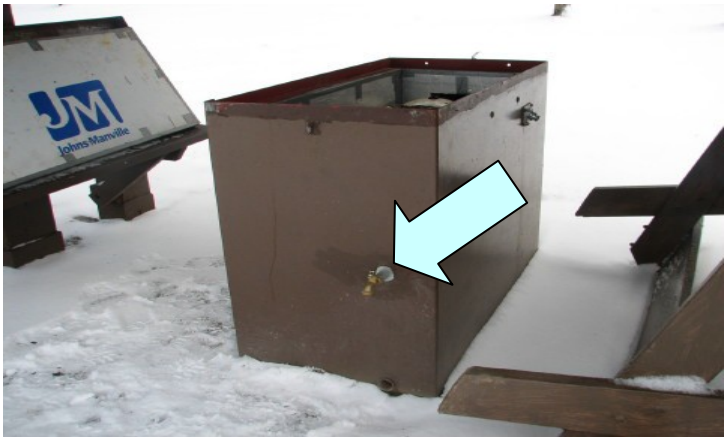
2. Close off pressure tank valve



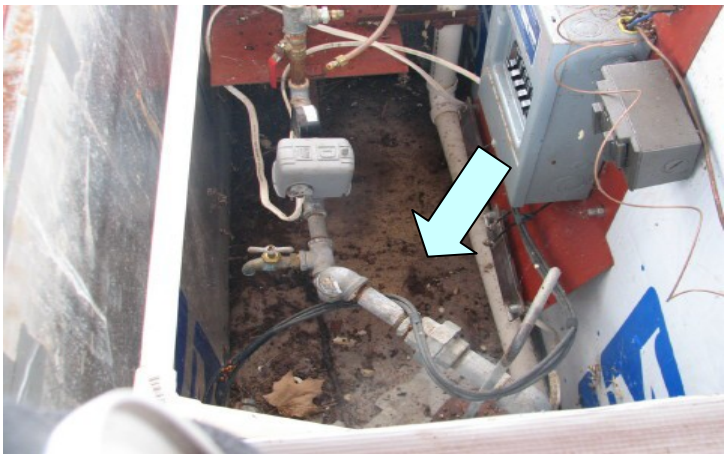
3. Turn on power to pump at the interior breaker.



4. Open jug filler valve and run at least 100 gallons of water out of the well.

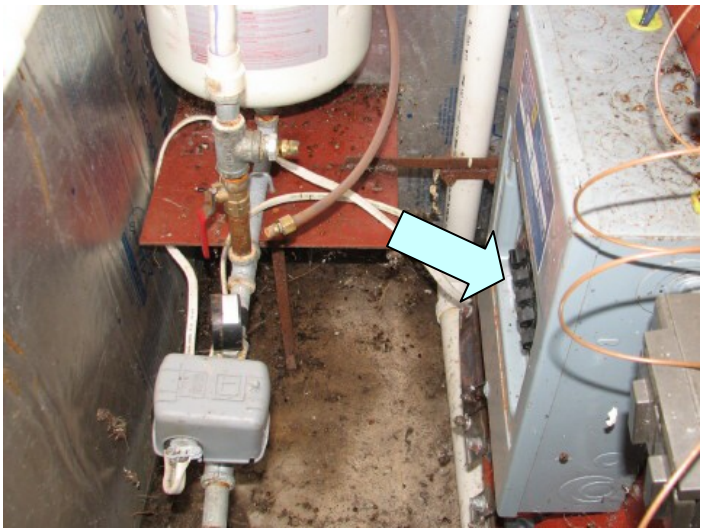


5. Clean out interior of well box structure.



6. Take water sample from interior sample spigot (follow proper sampling taking procedures).

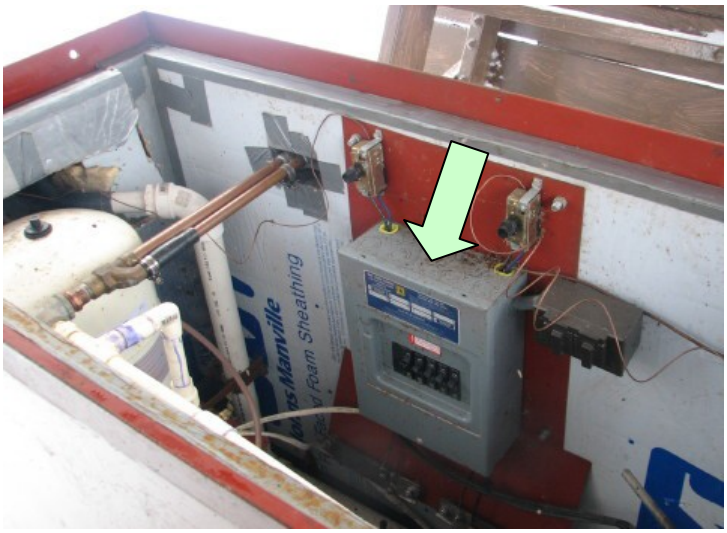
7. Shut down pump, replace cover and lock.



8. Wait for test results to determine if well can be opened to public use.

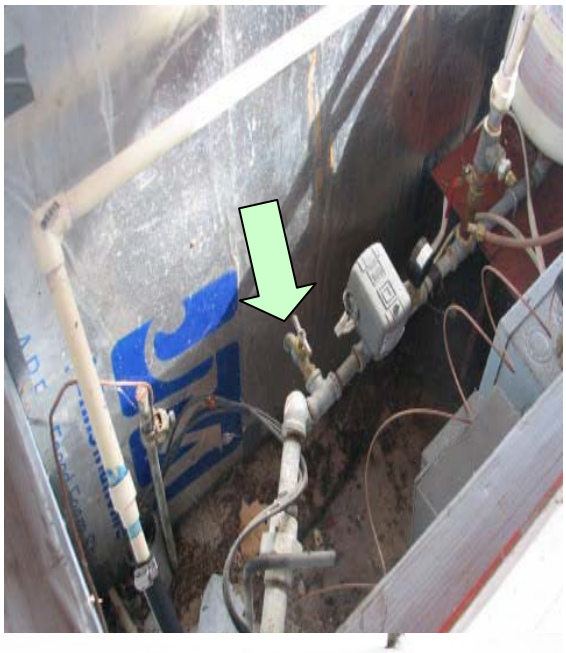
CLOSING PROCEDURES

1. Turn off pump breaker.

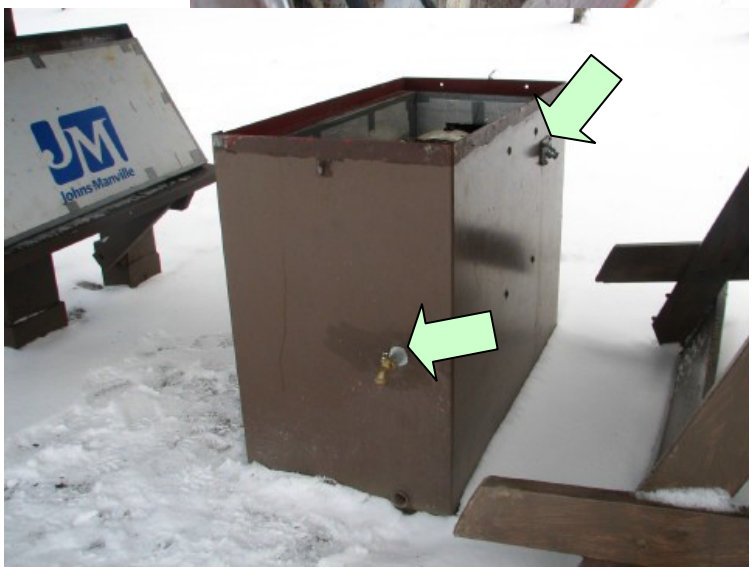


2. Open up drainage valve to allow water to drain back down to aquifer level.

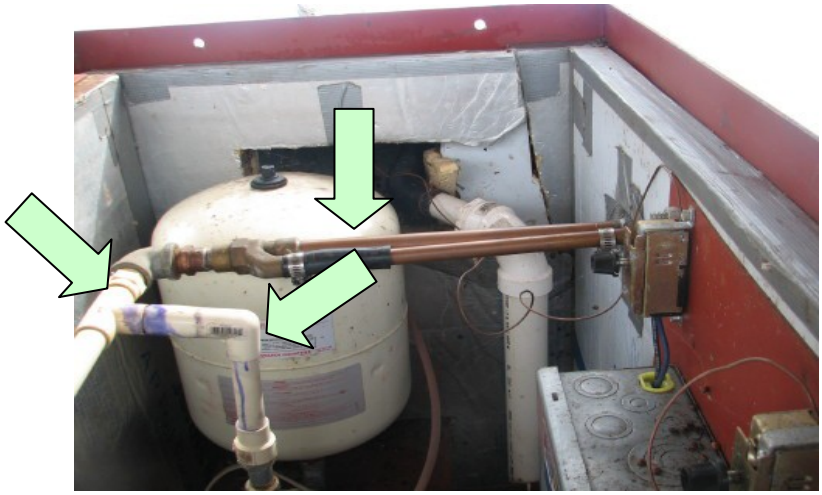
3. Open up test spigot to drain.



4. Open up fountain and jug filler valves and drain.



5. Blow out water lines to fountain and filler.



6. Open air valve on pressure tank.

7. Cover and lock.