



Private Water Systems Program Updates

Midwest Conference 2013

What's New for 2013

- o Private water system inspection changes
- o Newsletter with discussions on key issues
- o Website updates
- o Methane venting and mitigation
- o Water Quality Interpretation Website Project
- o OWWA Drilling Conference

Private water system Program Inspection Changes

- o Changes for contractor inspection requirements in 2011 rule revisions.
- o Some inspections by ODH
- o New inspections by local health districts
- o More information in the first presentation today





OHIO DEPARTMENT OF HEALTH
Bureau of Environmental Health

**Private
 Water
 Systems**

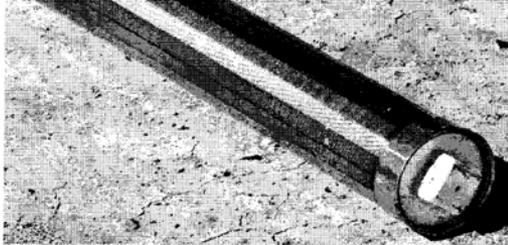
BULLETIN

November 2012 – Special Well Drillers' Edition

PSW has received a variety of calls over the past several months concerning use of well screens, formation stabilizers, and bentonite grout, so we thought it best to assemble a bulletin for well drillers and local health department environmental health sanitarians on the topics. If you have a question not addressed here, please contact the office so we can answer it for you. We can be reached at (614) 466-1390 or BEH@odh.ohio.gov.

The Private Water Systems Staff

SS Well Screen with end cap (Photo by Doug Rogers)



WELL SCREENS: FREQUENTLY ASKED QUESTIONS

The proper use and installation of well screens is often identified as a potential violation on many new well constructions for sand and gravel wells. Discussed below are common questions concerning well screens frequently asked by private water systems contractors contacting the Residential Water and Sewage Program.

When are well screens required to be installed?

OAC Rule 3701-28-10(K) states that well screens meeting specified construction standards shall be

installed in all wells completed in unconsolidated or incompetent formations unless the geologic formation prevents their use. An unconsolidated geologic formation includes zones of sands, sand and gravels, gravels, or mixes of sand, gravel and clay not cemented together in the borehole. An incompetent geologic formation is a mixture of materials not cemented together or only weakly cemented together.

What are the material and construction requirements for well screens?

Material and construction requirements for well screens are specified in OAC rule 3701-28-09(K). This rule states that screens are to be factory manufactured of steel, PVC or fiberglass and must be fitted with bottom caps. Perforated or slotted well casing or liner pipe installed in consolidated formation (rock) prone to collapse are not well screens and therefore not regulated by the rules pertaining to well screens.

What if it is necessary to extend casing beneath a well screen?

Drillers finding it necessary to extend casing beneath a well screen must remember OAC rule 3701-28-10 (E), requiring that all well casing be grouted. In a situation where a piece of casing is required beneath a well screen, an end cap needs to be placed at its deepest end, and be grouted up to the well screen.

What geologic conditions might prevent use of a well screen and how should this be documented?

During prior rule development discussions private water systems contractors asserted that a well

What's New for 2013

- o Overhaul of the private water systems website
 - o Water quality and water treatment information
 - o System information
 - o Rules crosswalk

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Private Water Systems Rules

Private water systems are regulated by the Ohio Department of Health (ODH) under Sections 3701.344 to 3701.347 of the Ohio Revised Code (ORC) and Chapter 3701-28 of the Ohio Administrative Code (OAC). Private Water Systems are potable water wells, ponds, springs, cisterns and hauled water storage tanks that provide drinking water to fewer than 25 people, less than sixty days out of the year, or have less than 15 service connections. These would include single water supplies that serve homes, small businesses, small churches, small mobile home parks or communities with fewer than 25 residents.

Private Water Rule revisions became effective April 1, 2011

- Private Water Systems Rules, [Ohio Administrative Code Chapter 3701-28](#)

Authority to Enforce the Private Water System Rules

- [Ohio Revised Code 3701.344](#)

Authority for Fees

- [Ohio Revised Code 3709.09](#)

Rule Subject	OAC Rule	FAQs	PowerPoints
Definitions	3701-28-01		PPT01-02
Scope and Responsibility	3701-28-02	FAQ02	PPT01-02
Permits and Water Sampling	3701-28-03	FAQ03	PPT03
Inspections and Sampling Procedures	3701-28-04	FAQ04	PPT04
Approval to Enforce (Surveys)	3701-28-05		PPT05-06
Fees and Fee Categories	3701-28-06	FAQ06	PPT05-06
Isolation Distance From Private Water Systems	3701-28-07	FAQ07	PPT07
Cross Connections, Piping, Sample Taps, Backflow Prevention, and other requirements)	3701-28-08	FAQ08	PPT08
Materials for Well Construction	3701-28-09	FAQ09,10,11	PPT09
Couplers for Extending Casing	3701-28-09 (D)		PPT09D
Well Construction	3701-28-10	FAQ09,10,11	PPT10
Well Start-up	3701-28-11	FAQ09,10,11	PPT11
Cisterns	3701-28-12	FAQ12	PPT12,13,14,15,16
Spring systems	3701-28-13	FAQ13	PPT12,13,14,15,16

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Water Quality and Treatment

In Ohio, many residents receive their drinking water from ground or surface water resources through private water systems such as wells, springs, ponds, rain water cisterns, and hauled water. The Ohio Department of Health (ODH) requires that the water provided from these systems be tested for a few basic contaminants

[Total Coliform bacteria](#)

[E. coli](#)

[Nitrates](#)

upon completion of the private water systems construction or alteration. Upon completion of the approval process, property owners need to take special precautions to ensure the protection and maintenance during the life time of their private water systems.

The Ohio Department of Health set new microbiological standards for private water systems through the revisions of the Private Water Systems rules effective April 1, 2011. These standards are summarized in the [Microbiological Standards for Private Water Systems in Ohio](#) fact sheet.

In addition to these requirements, ODH has established drinking water standards for private water systems based on the federal drinking water standards for public water systems (<http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf> or <http://water.epa.gov/drink/contaminants/>). These standards are to be used as a health standard to guide private water system owners on the potential health effects of exposure to different naturally-occurring and man-made constituents.

Testing for all the contaminants for the federal safe drinking water standards is expensive and not necessary for most systems. The Ohio Department of Health recommends that private water system owners test a few parameters such as total coliform counts, E. coli, nitrates and arsenic on a regular basis to maintain a record of water quality and identify any changes to the system or loss of water quality. Good records of water quality are important to prove if a private water system has been affected by a nearby land use activity. The following link (web page) will guide you to list of Laboratories approved by the Ohio Department of Health and the Ohio Environmental Protection agency to perform water testing on private water systems.

Water treatment, for private water systems, describes those processes used to make water more acceptable for use as a potable water source or to treat the water supply to remove known contaminants. The goal of all water treatment process is to remove existing contaminants or naturally occurring constituents in the water, or reduce the concentration of such contaminants so the water becomes fit for human consumption. The processes involved in treating water may include solids separation using physical processes such as settling and filtration, and chemical processes such as absorption, oxidations, disinfection and coagulation. Substances that are removed during the process of drinking water treatment include bacteria, viruses, suspended solids, minerals, and other chemical pollutants.

Microbiological Contaminants (Total Coliform and E. coli are located at the top of this page)

Microbiological Contaminants (Total Coliform and E. coli are located at the top of this page)

- Primary Pathogenic microorganism
 - "Primary pathogenic microorganism" which can cause disease in otherwise healthy people with exposure and dose and includes but is not limited to escherichia coli, enterococci or coliphage;

Coliphage	Cryptosporidium	Cyanobacteria (Blue-green Algae)
Enterococci	E. Coli	Giardia
Viruses		

- Opportunistic pathogens
 - "Opportunistic pathogen" is a commonly occurring microorganism found in water wells or a rare microorganism that does not normally cause disease in otherwise healthy people but can cause disease in sensitive populations including immune compromised individuals, infants, and the elderly."

Inorganic Chemical Contaminants

Antimony	Arsenic	Asbestos	Barium
Beryllium	Bromide	Cadmium	Calcium
Chloride	Chromium (total)	Copper	Cyanide
Fluoride	Hydrogen Sulfide	Iron	Lead
Magnesium	Manganese	Mercury	Nitrate
Potassium	Selenium	Sodium	Strontium
Sulfate	Thallium		

[Organic Chemical Contaminants](#) (click link)

Radionuclides

Alpha particles	Beta particles and photon emitters
Radium 226 and Radium 228 (combined)	Radon
Uranium	

Other Parameters

The following is a list of water properties and measurements that can be used to assess drinking water quality in private water systems supplies.

Hardness	pH	Specific Conductivity	Tannins
Total Alkalinity	Total Dissolved Solids	Total Suspended Solids	Turbidity

Natural and Man-made Events

The following provides information about extreme natural and man-made events that affect drinking water supplies from private water systems

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Water Quality and Treatment

Arsenic

Arsenic occurs naturally in rocks and soil, water, air, and plants and animals. It enters drinking water supplies from natural deposits in the earth or from agricultural and industrial practices. Arsenic is odorless and tasteless.

What are the Drinking Water Standards?

The EPA has set the arsenic standard for drinking water at 0.01 mg/L or 10 parts per billion (ppb) to protect consumers served by public water systems from the effects of long-term, chronic exposure to arsenic.

The Ohio Department of Health has adopted this standard as a non-enforceable health-based standard for private water systems.

What are the Health Effects?

- ODH Bureau of Environmental Health's Health Assessment Section - [Arsenic Fact Sheet](#)

What are the Treatment Options?

The treatment options, listed in the fact sheet below, are not enforceable by the Local Health Districts or the Ohio Department of Health. These are recommended options for private water systems owner.

- Ohio Department of Health's Bureau of Environmental Health - [Arsenic Treatment and Removal Fact Sheet](#)

References and Additional Resources

- Arsenic in Ohio Groundwater website (<http://arsenicinohiogroundwater.info/>)
- Agency for Toxic Substances & Disease Registry (ATSDR) – Arsenic (<http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=3>)
- USEPA - Arsenic in Drinking Water (<http://water.epa.gov/lawsregs/rulesregs/sdwa/arsenic/index.cfm>)
- ODH Health Assessment Section - [Arsenic in Gardening Fact Sheet](#)
- NSF Arsenic Fact Sheet (http://www.nsf.org/consumer/drinking_water/arsenic_fact_sheet.asp)

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Types of Private Water Systems

Ensuring the safety of drinking water from a private water system, whether it is a water well, spring, pond or rainwater cistern, is important. The Ohio Department of Health establishes construction standards for different sources of water and types of systems, and requires that contractor who work on these systems are registered and bonded to protect public health.

[Private Water Systems Contractor Registration](#)

Below is a list of the different types of private water systems. These links provide access to the standards for each type of private water system. These links will also provide additional information (such as FAQs, PowerPoint Presentations, and additional links to other websites) to private water systems owners, contractors, and local health districts to better understand the construction standards and terminology. This information should be helpful with the process of planning and constructing a new water system or altering or sealing an existing private water system.

- [Wells](#)
- [Ponds](#)
- [Springs](#)
- [Cisterns and Hauled Water Storage Tanks](#)

If you are unable to locate the information needed about the private water systems types, contact:

- [Private Water Systems Contractors](#): Lists for those located in Ohio and Out of State
- [Local Health Districts](#) - this link will allow you to Search for the address and phone number of your Local County or City Health Department
- [Ohio Department of Health Private Water Systems Program](#)



Ohio

Ohio Department of Health
Phone: (614) 466-3543 ~ Contact Us

Address: 246 N. High St., Columbus, Ohio 43215

Private Water Systems

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Cisterns and Hauled Water Storage Tanks

Springs

Wells

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WELLS

What is a Well?

As per the definition in [Ohio Administrative Code \(OAC\) rule 3701-28-01\(NNNN\)](#)

“Well” means any excavation greater than ten feet below the ground surface regardless of design or method of construction that is done or used for any of the following purposes:

1. Removing ground water for the provision of water for human consumption; or
2. Determining the quality, quantity, or level of ground water in or the stratigraphy of an aquifer, excluding borings for instrumentation in dams, dikes or levees or highway embankments.”



Rules and FAQs regarding Wells

Subject	Rules	FAQs
Wells constructed prior to April 1, 2011	OAC rule 3701-28-02 (C), (D), (E), (F), (G), and (I)	FAQ02
Materials	OAC rule 3701-28-09	FAQ09,10,11
Construction	OAC rule 3701-28-10	FAQ09,10,11
Development, Start-up, Operation	OAC rule 3701-28-11	FAQ09,10,11
Sealing	OAC rule 3701-28-17	FAQ17
Non-potable well conversion to PWS	OAC 3701-28-03 (K)	

Rules and FAQs regarding All Private Water Systems (wells, ponds, springs, cisterns, and hauled water storage tanks)

Subject	Rules	FAQs
Definitions	OAC rule 3701-28-01	
Scope, Responsibility, and Applicability	OAC rule 3701-28-02	FAQ02
Permit, System Approval, and Sampling Requirements	OAC rule 3701-28-03	FAQ03
Emergency Construction and Emergency Alteration	OAC rule 3701-28-03 (H)	
Inspection; Water Sample Collection and Analysis and Water Quality Standards	OAC rule 3701-28-04	FAQ04
Location, Operation, and Maintenance	OAC rule 3701-28-07	FAQ07
Requirements for all Private Water Systems	OAC rule 3701-28-08	FAQ08
Continuous Disinfection and Cyst Reduction Filtration	OAC rule 3701-28-15	FAQ15

Methane venting and mitigation

- o Development of guidance for methane in private wells
- o Guidance will include venting and treatment options
- o Also developing uniform guidance for dissolved methane water sample collection
- o More after lunch.....

Water Quality Interpretation Website Project

- o Water Quality Interpretation website joint project with OSU, Cooperative Extension and Ohio EPA
- o Development of a web based tool to help well owners understand water quality sample results
 - o Information on how to read lab results
- o Tool will provide information based on the results entered
 - o Are my results within normal ranges?
 - o What are the potential health effects?
 - o What are treatment options



Northern Plains & Mountains Regional Water Program

Applying knowledge to improve water quality

A Partnership of USDA NIFA & Land Grant Colleges & Universities

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Water Quality Interpretation Tool

- Evaluation
- Resources
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Welcome to the Northern Plains and Mountains Water Quality Interpretation Tool. This tool has been created to help you evaluate your drinking, livestock and irrigation water quality. *Adobe Reader is required to view PDF files. To download free Adobe Reader software [click here](#).*

To use the tool, simply follow these steps:

1. **Select the state where you collected your water samples:**
2. **Select your water application type:**
3. Enter the values that have been provided to you by a laboratory in the spaces pertaining to your analyses results. If you do not have a value for a particular parameter, leave the space blank.
4. Click the submit button below to obtain a table with an interpretation of the quality of your water.
5. If you need to start over, or wish to enter data for a different type of water, click the reset button below.

Welcome to the Northern Plains and Mountains Water Quality Interpretation Tool. This tool has been created to help you evaluate your drinking, livestock and irrigation water quality. *Adobe Reader is required to view PDF files. To download free Adobe Reader software [click here](#).*

To use the tool, simply follow these steps:

1. **Select the state where you collected your water samples:** Colorado
2. **Select your water application type:** Drinking Water
3. Enter the values that have been provided to you by a laboratory in the spaces pertaining to your analyses results. If you do not have a value for a particular parameter, leave the space blank.
4. Click the submit button below to obtain a table with an interpretation of the quality of your water.
5. If you need to start over, or wish to enter data for a different type of water, click the reset button below.

Routine Water Analysis

Alkalinity as CaCO ₃	<input type="text"/>	mg/L
Ammonium (NH ₄)	<input type="text"/>	mg/L
Bicarbonate	<input type="text"/>	mg/L
Boron (B)	<input type="text"/>	mg/L
Calcium (Ca)	<input type="text"/>	mg/L
Carbonate (CO ₃)	<input type="text"/>	mg/L
Chloride (Cl)	<input type="text"/>	mg/L
Electrical Conductivity (EC)	<input type="text"/>	dS/m (mmhos/cm)
Hardness as CaCO ₃	<input type="text"/>	mg/L
Magnesium (Mg)	<input type="text"/>	mg/L
Nitrate as Nitrogen (NO ₃ -N)	<input type="text"/>	mg/L

Trace Elements Analysis

Antimony (Sb)	<input type="text"/>	mg/L
Arsenic (As)	15	mg/L
Beryllium (Be)	<input type="text"/>	mg/L
Cobalt (Co)	<input type="text"/>	mg/L
Cyanide (CN) (free)	<input type="text"/>	mg/L
Fluoride (F)	<input type="text"/>	mg/L
Lead (Pb)	<input type="text"/>	mg/L
Lithium (Li)	<input type="text"/>	mg/L
Mercury (Hg)	<input type="text"/>	mg/L
Selenium (Se)	<input type="text"/>	mg/L
Silver (Ag)	<input type="text"/>	mg/L

Interpretations of Drinking Water Quality for Colorado

Test Name	Lab Result	Interpretation	Acceptable	Additional Comments
5) Trace Elements Analysis				
Arsenic (As)	15 mg/L	Objectionable	≤ 0.01 mg/L *	<p>This water is considered objectionable because it does not meet the MCL of 0.01 mg/L. Arsenic is poisonous in humans at 100 mg or more and has proven lethal at 130 mg. Studies have linked long-term exposure to arsenic in drinking water to cancer of the bladder, lungs, skin, kidney, nasal passages, liver, and prostate. Non-carcinogenic effects of arsenic include cardiovascular, pulmonary, immunological, neurological, and endocrine effects. Short-term exposure to high doses of arsenic can cause other detrimental health effects, but are unlikely to occur from public water supplies in compliance with the existing arsenic standard of 0.01 mg/L. Accumulation in the body is expected to rise progressively in humans with low intake of arsenic. By using activated alumina, reverse osmosis, ion exchange, or electro dialysis, the concentration of arsenic can be significantly lowered. For more information about arsenic in drinking water please visit:</p> <ul style="list-style-type: none"> EPA: Basic Information about Arsenic in Drinking Water Well Educated Fact Sheet- Arsenic WHO: Chemical fact sheets

* MCL (Primary Standard)
 ** SMCL (Secondary Standard)
 *** Upper Limit Guideline

[Click here to print](#)

Water Quality Interpretation Website Project

o Next Steps

- o Discussion session with technical experts
- o Outreach and survey with well owners in 3 counties
- o Development of tool design and layout
- o Testing by experts/well owners
- o Project completion by June, 2013

Ohio Water Well Association

- o 2013 Well Construction Conference Outdoor drilling conference
- o May 16, 2013
- o Location: Miami County, Pleasant Hill, Ohio

2013 Well Construction Conference

LIVE DRILLING DEMO



Save the date: May 16, 2013

The purpose of the Well Conference is to bring together different sectors of the water industry. It is to demonstrate how collaboration between the different drilling industries can be beneficial. The conference will feature demos of both water wells and geothermal wells. It will also show the proper use of grouting and the proper handling of site elements such as septic systems, future leach lines, existing private water systems and proper isolation distances.

