

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WELL WATER TESTING

(no.)

CODE 355

DEFINITION

Testing for physical, biological and chemical characteristics of well water.

PURPOSE

To determine the quality of a water supply for the intended use.

CONDITIONS WHERE PRACTICE APPLIES

This practice only applies where drinking water comes from private water wells primarily in agricultural areas. This standard does not cover testing of water from rural water supplies or municipal water supplies.

This practice only applies to tests described. Testing laboratories can check for many other nutrients, minerals, trace metals, and pesticides.

CRITERIA

The specific use of the water and the water quality concerns shall be identified.

The required tests and applicable standards shall be determined based on the planned use of the water.

Common Testing Requirements

Well water shall be tested annually for total coliform bacteria, total dissolved solids, nitrate, hardness, and pH. Additional testing may be required depending on results of the above tests.

Chemical analysis of well water must be completed by a laboratory that is currently enrolled in the Oklahoma Department of Environmental Quality (DEQ) Drinking Water Laboratory Certification Program. The U.S. Environmental Protection Agency (EPA)

establishes National Primary and Secondary Drinking Water Regulations which are legally enforceable standards for public water systems. DEQ may have additional limitations for specific contaminants. Limits described in this standard are derived from the EPA and DEQ regulations as of the issuance date of the standard. Limits are periodically revised and applicable values should be checked prior to use of this standard. Revised limits from EPA or DEQ supersede this standard.

Obtaining a sample

Consult an appropriate testing laboratory prior to obtaining a sample. Inform the laboratory of the types of testing needed and follow their recommendations exactly. Failure to follow recommended sampling techniques could result in faulty results. Provide all information requested.

Interpreting results

The following are rough guidelines for some common water well analyses. For more specific information on a specific test result, contact a water quality specialist.

Total Coliform Bacteria - The Coliform group of bacteria is used as an indicator organism to prove the possible presence of pathogens. A total coliform-positive test result indicates a possible source of waste contamination. Coliform bacteria are most commonly found in older, shallow wells in porous soils near faulty septic systems or animal feedlots. Coliform bacteria can indicate the possible presence of pathogenic organisms which can cause intestinal infection, dysentery, typhoid, and hepatitis. Specific tests for fecal coliform shall be conducted if the presence of total coliform is indicated. This test may require specific sampling techniques; check with the testing facility prior to obtaining a sample.

Total Dissolved Solids - The recommended upper limit for total dissolved solids is 500 mg/l (ppm). Waters over that limit should not be used if better quality water is available. Palatability of the

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water may be affected. Chloride, sulfate, and alkalinity are primarily responsible for the dissolved solids content of the water. Individual tests for these constituents may be in order if TDS exceeds the recommended limit.

Nitrate - The maximum allowable level for nitrate in a domestic well, a public water supply, or other primary source of drinking water is 10 mg/l (ppm). Nitrates are of particular concern to pregnant women and infants under six months old since drinking water high in nitrates may cause methemoglobinemia (blue baby syndrome). Sources of nitrates include soil, sewage, and fertilizers. Tests for nitrite should also be ordered if nitrate levels are a concern.

Hardness - Waters with a total hardness less than 75 mg/l (ppm) are considered to be soft, those between 75 and 150 mg/l (ppm) are moderately hard, those between 150 and 300 mg/l (ppm) are hard, and those greater than 300 mg/l (ppm) are very hard. Hard waters are as satisfactory for drinking as soft waters. The total hardness of a water will affect the amount of soap needed to produce suds or lather. Excessive hardness may, however, cause laundering difficulties or produce scale in hot water tanks and cooking utensils. Hardness is generally derived from contact of the water with natural accumulations of salts in soil and geological formations. If water tests hard or extremely hard, additional tests for total alkalinity, calcium and magnesium may be in order.

pH - The optimum range for pH in drinking water is 6.5 to 8.5 standard units depending on the alkalinity and other factors. Total alkalinity measures water's ability to resist sudden changes in pH and might be another test to consider.

Contaminated Water - Any analysis outside the range of the above results is considered contaminated. The first step is to take another well sample. Several factors could produce a misleading test result. If a second test indicates contamination, consult with the testing laboratory or water quality specialist for further guidance.

CONSIDERATIONS

The test methods and results presented in this standard only apply to common testing considerations. If there is concern for a specific contaminant in a well, a more detailed testing procedure should be completed for that specific concern. Your local health department can assist

in completing specific water well tests. Other items to consider testing for include lead, copper and iron from plumbing or fixtures and sodium if diet is regulating sodium (salt) intake.

PLANS AND SPECIFICATIONS

Water well testing should be done in accordance with this standard. No additional plans or specifications are needed to complete common water well tests.

Test laboratories may have specific criteria and forms that must be completed before they will perform water well tests. It is recommended that a laboratory be contacted for this information before a sample is submitted.

OPERATION AND MAINTENANCE

Water well testing is used to identify water that is not safe for the intended purpose. Prevention of well contamination is preferred over treatment of a contaminated well. The following measures can assist in preventing well contamination:

- Periodically inspect exposed parts of the well for problems such as:
 - cracked, corroded, or damaged well casing;
 - broken or missing well cap;
 - settling and cracking of surface seals.
- Slope the area around the well to drain surface runoff away from the well.
- Install a well cap or sanitary seal to prevent unauthorized use of, or entry into, the well.
- Disinfect drinking water wells at least once per year with bleach or hypochlorite granules. Follow the requirements outlined in the Oklahoma Department of Environmental Quality fact sheet on Disinfection of Individual Water Wells.
- Keep accurate records of any well maintenance, such as disinfection or sediment removal, that may require the use of chemicals in the well.
- Hire a certified well driller for any new well construction, modification, or abandonment and closure. Refer to NRCS Conservation Practice Standards Well (642) and Well Decommissioning (351), as appropriate.
- Avoid mixing or using pesticides, fertilizers, herbicides, degreasers, fuels, and other pollutants near the well.
- Do not dispose of wastes in dry wells or in abandoned wells.
- Do not cut off the top of the well casing below the ground surface.

- Pump and inspect septic systems as often as recommended by your local health department.
- Never dispose of hazardous materials in a septic system.
- Use only cold water for washing food or for food preparation.
- Allow water to run to clear the system before use.

Records on water testing information will include:

- Date and time water sample taken,
- Name and title of person who collected sample,
- Standard collection procedure followed,

- Water test analysis date,
- Laboratory used,
- Contaminants tested for,
- Schedule of additional testing at required frequency according to applicable standard,
- Records to evaluate trends and the effects of remedial action,
- Weather data, and
- Other records as required.