

101 Reasons For A Water Sample To Be "Unsafe"

by Mike Furstenberg, [Clean Water Testing, Inc](#)

Periodically, a well driller, a pump installer, a plumber or a water treatment professional will take a water test, and it will test bacteriologically “unsafe” for coliform bacteria (say: *CO LA FORM*). It is a documented fact that most aquifers are “safe,” so why would a water sample be “unsafe”? Most of the time a sample is “unsafe” because of a plumbing problem – surface water is getting into the well or the pressure tank is causing a problem, etc. The following is a starter list of possible problems; the list is to get you thinking of what could be wrong. It is a trouble-shooting checklist to use on the job. As you find new problems with wells and water systems in the field, please share them with us and we will add them to the list.

1. Poor sampling technique – dirty hands, sample bottle cap set on ground or counter top, sample water poured from another container to sample bottle, water splashing off floor or bottom of sink while taking water sample, etc. (bacteria testing is *very* sensitive).
2. Dirty sampling faucet.
3. Leaking or dirty swing tap.
4. Plastic parts on sampling faucet – if it has a plastic throat, don’t use it!
5. Sample taken through a faucet aerator.
6. Faucet not “flamed” (sterilized)—do not clean the faucet by wiping with bleach or an alcohol wipe. Alcohol wipes can be used as a small torch.
7. Insects in a frost-free hose bib—you know, the self-draining outside faucets.
8. Sampled through a garden hose—never, *ever*, take a sample from a hose.
9. Garden hose water line (to the garage, etc.)—bacteria *love* garden hoses (and, bacteria can move backwards through a water system).

10. Stagnant water in an unused well—if it hasn't been used, chlorinate it.
11. Bad pressure tank.
12. Buried pressure tank with pin hole leak
13. Standard pressure tank with contamination (bacteria) above the water line—always waterlog a standard tank when chlorinating a system.
14. Bladder or diaphragm in pressure tank leaking.
15. Bladder in captive air pressure tank fouled and the bacteria have turned anaerobic (septic).
16. Iron or sulfur bacteria have built-up a heavy bio-film (slime, algae) which is hiding and growing coliform bacteria—offer a service of cleaning customers wells once a year.
17. The well hasn't been cleaned in 20 years and just plain needs a good well cleaning (shocking, chlorination)
18. Unused, off-line water softener that is fouled—what a great place to grow bacteria.
19. Well casing too close to the ground—keep them 12" high—a lawnmower can blow dirt in the well.
20. Broken well cap—insect and vermin problems, ever see a kid throw a stick down a well.
21. No well cap at all—or a pail or coffee can over the well casing.
22. Insects in the well—anything crawling across the ground can contaminate a well.
23. Earwigs in the well—only way to clear earwigs is to “blow” the well (or drill and blow) and aggressively clean (chlorinate) the well.
24. Broken (leaking) lateral between the well and the house.
25. Crack in the well casing—or a bad weld at a seam.
26. Leak at the pitless adapter.
27. Poor grout job at the well casing, or no annular space seal—surface water running down along the outside of the well casing.
28. Depression at the well casing—surface water gathers there, saturates the soil and runs down next to the well casing.

29. Well casing has lifted with the frost—so pound it back down.
30. No back flow prevention device between the boiler (hot water heat) and the water system.
31. No check valve (or a leaker) between the water system and a solar panel
32. An electrical problem in the well—a skinned wire can provide an environment to enhance bacterial growth. Fix the electrical problem and the “unsafe” will go away. If you have “red” water out of the tap, you may have an electrical problem in the well.
33. Buried suction line—jet pump with no conduit or Standard Seal-Cross fitting.
34. No air gap at the dishwasher.
35. Sample taken with the pump off—it is best to take a sample with the pump running.
36. Sample not taken at the sample faucet—we don’t care what the water is like in the house as much as we care what the water is like out of the well. Even though your customer drinks water from the kitchen tap, we encourage you to sample the water as close to the well as possible.
37. Well housed in a non-complying well pit.
38. Rain gutter downspout directed at well casing.
39. Sump pump discharge directed at well casing.
40. Flowing well overflow discharge less than 8 feet from well
41. No overflow for seasonally flowing well—when it flows, it overflows over the top of the well and down the casing.
42. No air gap at flowing well overflow discharge—bacteria, vermin and fish can swim up the discharge pipe and into the well.
43. No screen on a flowing well discharge at the air-gap—if the water table drops or there is a big draw-down with a submersible pump, vermin can get sucked into the well.
44. No air gap at the surge tank of a flowing well.
45. An abandoned (un-abandoned) well (especially a pit well) in the vicinity of the present well.
46. A second, unused well on the property (or neighbors property)

47. Short cased well—especially in high bedrock or quarried areas.
48. Adjacent septic system constructed in coarse sand or gravel—coarse sand (especially in unapproved systems) may not filter out bacteria.
49. Well formation in high bedrock or coarse sand or gravel—there is no filtration of surface water; the bugs just go right on through!
50. Home made plumbing or plugs in the water system
51. Leaking, non-compliant or improperly installed yard hydrant.
52. Hydrant or hose bib without an anti-siphon device—and a watering trough has siphoned back into the well when the pump failed.
53. Check valve in well failing—water could back siphon from toilet, pool, garden hose, laundry tub, etc.
54. Hole in the drop pipe of a submersible pump drawing water back into the well
55. Water softener regeneration discharge line direct plumbed to soil pipe (sewer).
56. No air gap at end of water softener backwash line.
57. Sabotage! Ouch!
58. Nearby drainage well—there was a period when field tile could be drained to a drainage well.
59. Well drilled in field tile drainage bed.
60. Septic system drain field less than 50 feet from well—we have seen drain fields less than 2 feet from the well!
61. Dogs peeing on well casing—or worse.
62. Dirt or vermin sucked up short electrical conduit and into the well on wells with vermin proof well caps and an excessive well drawdown.
63. Laboratory error—*very* rare!
64. Non-sterile sample bottles—request sterile water sample bottles from your lab and do not store them in your truck. Do not boil canning jars or mayonnaise bottles.
65. Problem with an intrusive style pitless adapter—most of them leak!

66. Snifter valve or air injection unit sucking basement air into pressure tank.

67. Well in a flooded well pit, alcove, or basement.

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75. This is a never-ending list of well problems. It is as long as the number of wells that have “unsafe” water tests for coliform bacteria.