



Fact Sheet

Introduction

- 90% of rural Albertan's get their drinking water from a well.
- If you answer *no* to any of these questions, your groundwater supplies could be at risk:
 1. Have you had your well water tested in the last two years?
 2. Have old unused wells on your property been properly sealed and decommissioned?
 3. Have you ever shock chlorinated your well?
 4. Do you know the age and depth of your well, or how it was constructed?
- Proper water well construction, siting and maintenance will help protect your well from biofouling and contamination, save you costly repairs, and ensure your well water yields are sustained over many years.
- As a landowner, you are responsible for looking after the water wells on your property.
- The key to ensuring your water is safe and secure is knowing how groundwater works and knowing your well and how to properly maintain it.

Groundwater

A misunderstood resource

- In Alberta, groundwater does not come from fast flowing underground rivers and lakes.
 - Rather, groundwater is the water that fills the cracks and spaces between soil particles, sand grains and rock.
 - Groundwater and surface water are connected. Snowmelt and rain seeps into the ground, trickling downward through the soil until it reaches the water table.
 - The water table is the point at which the ground is completely saturated with water. Below the water table, the spaces between every grain of soil and rock are completely filled with water.
 - An aquifer is simply a water bearing zone in the earth where interconnected cracks and pore spaces (e.g. in sand, gravel or fractured bedrock such as sandstone and shale) allow groundwater to move more freely.
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Water, the great 'dissolver'

- Water is the world's greatest solvent: it tries to dissolve everything it comes in contact with.
- Manure, pesticides and fertilizers over-applied to lawns and fields can be carried by rain or snowmelt seeping down through the soil to the water table.
- Sewage from improperly maintained septic systems or spilled and improperly disposed-of chemicals can similarly seep into groundwater.
- If you have highly permeable soils on your land, such as sand or gravel, your groundwater could be at higher risk.
- Having abandoned, old, poorly constructed or infrequently maintained wells on your property is even more risky because such structures could be draining surface water, and everything it carries, *directly* into your aquifer.



Install a Properly Designed and Constructed Water Well

- A properly designed and constructed water well is a property owner's most important investment.
- When getting a new well installed select a reputable driller and know what well features to ask for. Key features of a good well include:
 1. **Setbacks:** Alberta requires minimum setbacks between water wells and contamination sources such as septic systems, manure piles and chemical and fuel storage. However, shallow wells and wells in gravelly or sandy soils are at higher risk of contamination, and may need greater setback distances or special protective measures.
 2. **Landscaping:** The ground around your water well should be mounded and landscaped to ensure that surface water is not running towards and pooling around the outer casing of your well.
 3. **Pitless adaptors:** Well pits for new wells were banned in Alberta in 1993. However many Albertans still have their wells in pits. Well pits are reservoirs for contaminated surface water, mice and debris, and put your groundwater at risk. They can also contain dangerous gases. If you have a well pit, have it removed by an experienced contractor and install a pitless adaptor instead. Pitless adaptors provide a safe, sanitary and frost-free connection between your pumping system and your water well.
 4. **Vermin-proof well cap:** To prevent contaminants, animals, insects and children from getting into your well, it should be protected with a vermin-proof cap. Vermin-proof caps can be sourced by your local well driller.
 5. **Watertight borehole seal:** Surface contaminants can drain directly into your aquifer through the space between your well casing and the borehole if this space is not properly sealed. This space should be tightly sealed with cement or bentonite, from the surface all the way down to the aquifer tapped by your well.

6. **Single Aquifer Source:** Constructing a well so it draws water from more than one aquifer might increase your gallons per minute, but it also puts your groundwater at higher risk of contamination. When you get a new well drilled, tell your drilling contractor that you prefer to have your well draw from a single aquifer only - this is mandatory if your well is to be licensed through Alberta Environment.
7. **Backflow prevention:** Contaminated water can flow backwards into your well through your hydrant and plumbing. When mixing pesticides, fertilizers or other chemicals, don't put the hose from your well inside the tank or container; make sure you always leave an air gap between the hose and your tank. For added security, install backflow prevention devices, such as vacuum breakers.
8. **User friendly:** Most farm and acreage wells in Alberta do not have user-friendly designs, making regular monitoring and maintenance difficult. This can be overcome by installing an access tube in your well, for easier water monitoring and treatment. A hydrant, installed several meters away from the well, can help make pump testing and water quality testing easier.

Plug Old Wells & Holes

- While the driller is on your property drilling a new well it's a good idea to have him plug any old or unused wells.
- Surface water draining down through old wells can contaminate the aquifer tapped by your new well.
- Ensure the driller plugs your old well from bottom to top with bentonite or cement grout (required by Provincial legislation).
- Also make sure seismic shotholes on or around your property are properly plugged

Understand Your Drilling Report

- Drilling reports contain specific information about how a water well was drilled and constructed.
- Since the mid 1970's water well drillers have been required, by legislation, to submit drilling reports to Alberta Environment. Make sure the driller gives you a copy and that you understand how your well was constructed.
- These reports contain important information needed to help you manage and protect your well.
- You can get copies of drilling reports for your water wells (you will need a legal description of your property) from the following sources:
 - www.telusgeomatics.com/tgpub/ag_water
 - Alberta Environment Groundwater Information Centre: (780) 427-2770
 - Your County office

Do NOT Overpump Your Well

- Over-pumping is one of the biggest causes of well problems.

- Make sure the drilling contractor does a full pump test (water levels should be measured during draw down and recovery) and provides a recommended pumping rate for your new well. This should be noted on your drilling report.
- Never exceed the recommended pumping rate for your well.

Manage Activities on Your Land

- Manage land uses on your property to minimize seepage of contaminants into groundwater, especially if you have sandy or gravelly soils or a shallow well. Don't over apply manure, fertilizers and pesticides to your fields and gardens.
- Consider developing an Environmental Farm Plan for your operation (www.albertaefp.com).

Inspect Your Well

- You should regularly inspect your well and the area around your well, to ensure that:
 1. The well cap is secure and the vents are not blocked
 2. There are no open gaps around the outside of your well casing.
 3. There is no ground settling or water ponding around the well casing
 4. Adequate setbacks are being maintained between your well and potential contaminants, such as manure piles and chemical and fuel storage.
 5. The pressure tank and water treatment system are operating properly
 6. Your septic system is working properly - your septic tank should be inspected yearly to determine if it needs to be pumped out.

Test Your Well Water

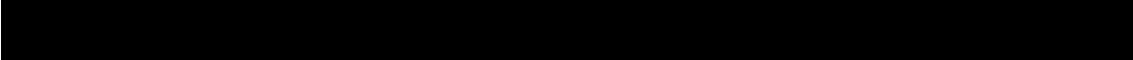
- Water testing can tell you if there are problems with your water supply, and whether you need to disinfect your well.
- Your regional health authority will test your well water. Contact them for sample bottles and sampling procedures.
- You should get a standard coliform bacteria test done on your well water at least twice a year, or more often if you have a shallow well (less than 50 ft in depth).
- You should have get a routine water chemistry test done on your well water every two years.
- You should also test your water upon noticing any significant change in water quality, in terms of staining, colour, odour or taste.
- Your regional health authority will review the test results and advise on any necessary treatment measures or health risks.
- Check for slime in your toilet in the reservoir – slime indicates that you have iron or sulfur reducing bacteria in your well. Although these bacteria are not harmful to humans, they affect the smell and colour of your well water, and can cause significant damage to your well through biofouling.

Disinfect Your Well

- If your well water tests positive for coliform bacteria your regional health authority will advise you on a course of action, which may include disinfecting your well through shock chlorination.
- If you find slime build up in your plumbing fixtures (ex. toilet reservoir), you will likely need to shock chlorinate once or twice a year to keep your well disinfected.
- If your well has not been properly maintained or regularly disinfected, shock chlorination may not be effective without first cleaning your well. This should be done by a professional driller, using chemicals, wire brushes and/or surge block or jetting tools.
- If you have an older well, seek advice by shock chlorinating.
- You can get information on how to shock chlorinate your well from your local health authority, or from the booklet *Water Wells That Last for Generations*, available:
 - on line from www.agric.gov.ca/water/wells
 - by calling Alberta Environment's Info Line on (780) 427-2700.

Keep Good Records

- It is important to keep records of your drilling reports, well inspections, water tests and treatments.
- By keeping good records you can see how your water quality and well performance has changed over time.
- If you sell your property, this information should be passed on to the new owners.

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- Well owners can find more information on maintaining their wells in the booklet *Water Wells That Last for Generations*, available:
 - online from www.agric.gov.ca/water/wells
 - by calling Alberta Environment's Info Line at (780) 427-2700 (for toll-free dial 310-0000)
 - For technical questions or advice, well owners can call the Ag Info Centre toll free at 310-FARM (3276)
 - Additional information (including a booklet and video) is available online from Well Aware at:
 - www.wellaware.ca