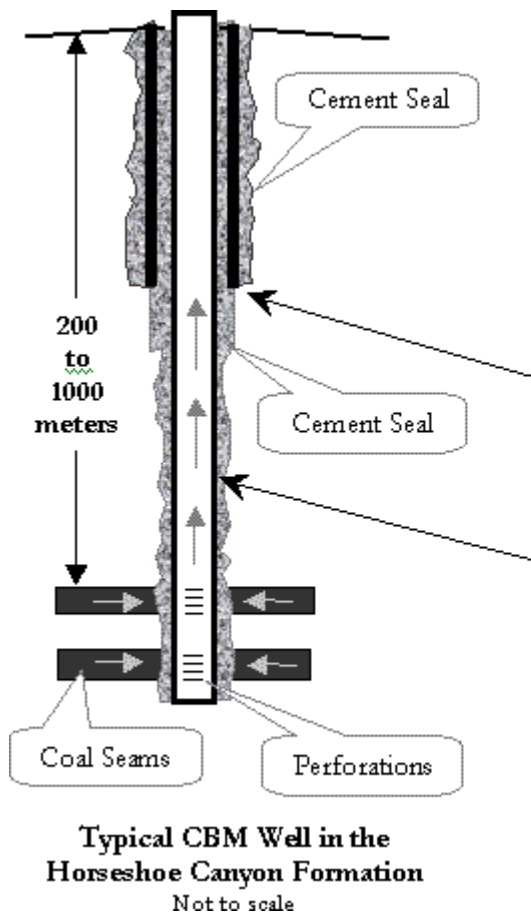


Coal Bed Methane (CBM) Wells & Water Well Protection



CBM and conventional gas wells must be properly cased and cemented to prevent migration of gas into any aquifer, mixing of water between different aquifers and groundwater contamination. Casing and cementing must protect non-saline groundwater resources. Non-saline groundwater, which can be more easily used, refers to water having Total Dissolved Solids (TDS) of less than 4000 mg/L. The recommended base of groundwater protection, below which TDS content exceeds 4,000 mg/l, is generally 150 to 300 meters(m) deep in much of Alberta.

SURFACE CASING (ERCB Directive 008) provides well control and groundwater protection

- Depth is typically 10% of True Depth (TVD)
- The casing is cemented full length (ERCB Directive 009)

PRODUCTION CASING (ERCB Directive 009) brings gas to the surface and provides groundwater protection.

- The casing must be cemented full length if less than 180 m of surface casing has been run, or if casing is not set 25 m below any aquifer containing useable (non-saline) water (ie. base of groundwater protection)
- If production casing is not required to be cemented full length, the casing shall be cemented to 100 m above the shallowest potential hydrocarbon bearing formation.

**CBM Well Information and ERCB Directives are available on
ERCB's website: www.ercb.ca**

Look under Publications for ERCB Directives to view an online copy.
ERCB Directives that may be of particular interest to water well owners
are 008, 009, 027, or 035.

Water wells to be drilled deeper than 150m require an ERCB well license

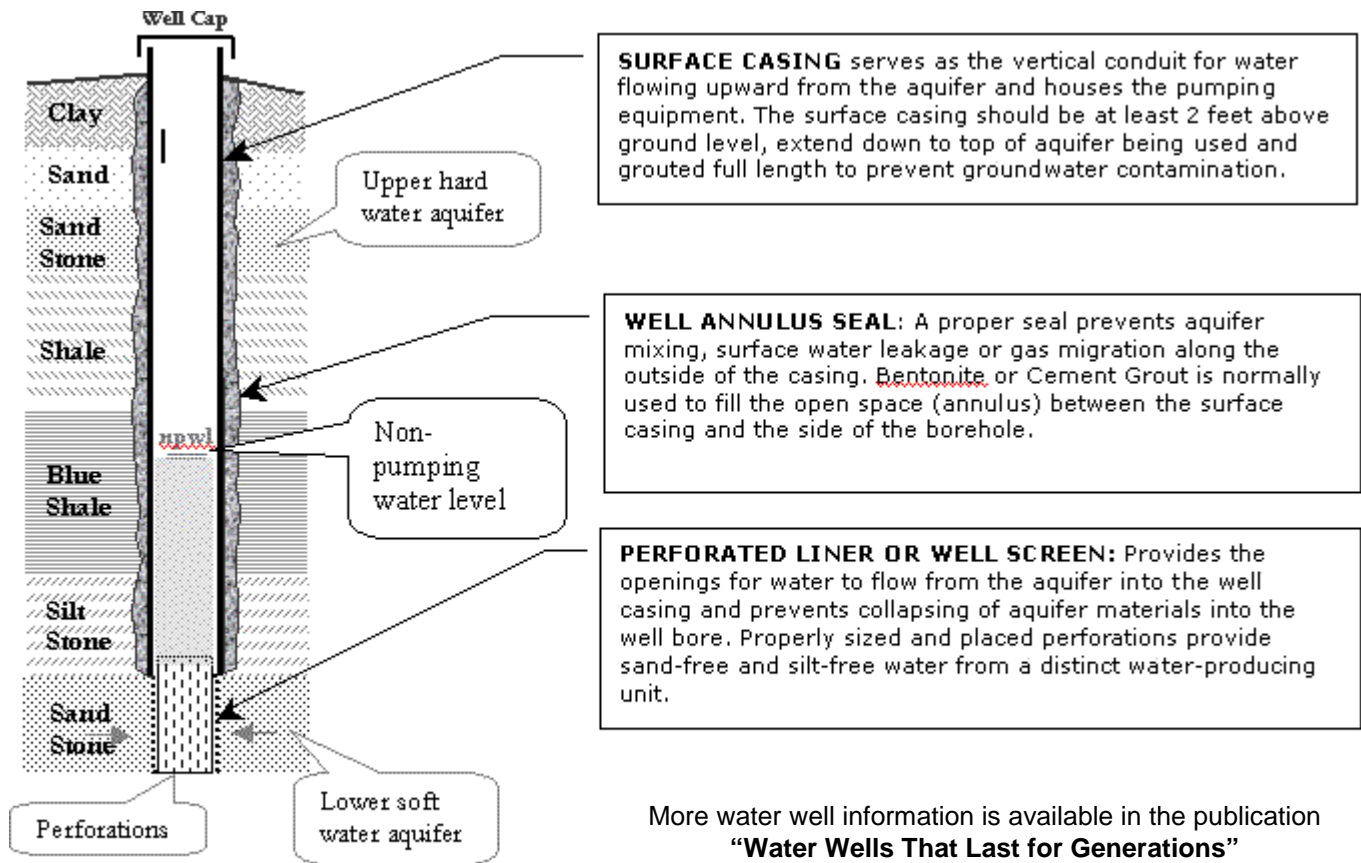
Many of Alberta's water wells naturally contain methane already. Methane is a tasteless and odourless gas that can cause spurting taps and gas locked pumps. Trapped methane in well pits or pump houses can explode. Therefore, proper venting and safety precautions are essential to prevent injury.

Measures You Can Take to Protect Your Water Well

It is important to monitor your water wells on a regular basis, especially before seismic and oil/gas drilling activities start. Pay attention to the following details:

1. **Water Well Site and Well Condition.** Make sure that the area around your well is protected from contamination and the water well casing is in good condition.
2. **Water Quality.** Have a routine chemical and microbiological analysis done on the well water through an accredited laboratory. Methane tests are not part of a routine or microbiological analysis.
3. **Well Production.** Have repeatable pump tests done on your water well before and after oil and gas activity takes place. This is not a test of how hard your well can be pumped as the pumping rate should be less than actual well capacity. The pre-test and post-test must be done using identical test procedures. Pumping must be done at a constant rate and water level measurements recorded at specified time intervals during both the pumping and recovery cycles. Recovery time should be equal to pumping time.
4. **Static or Non-Pumping Water Level (npwl).** Accurate measurement on a regular basis is important so that you know if your aquifer is depleting or being sustained.

Proper Water Well Construction Can Protect Water Quality



Typical Water Well

Not to scale

More water well information is available in the publication

“Water Wells That Last for Generations”

Go to Alberta Agriculture’s Web Site

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/wwg404](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/wwg404)

or call 1-800-292-5697 (toll free) for a printed version.

Groundwater Risks

1. **Know and record where existing water wells are located on your property.** Obtain well construction details and water quality information where possible. Alberta Environment maintains well records on their ground water information system. Visit Alberta Environment or phone the Groundwater Information Center at (780) 427-2770 or online at [Alberta Water Well Information Database](#).
2. **Make sure your new water well is constructed in a manner that protects groundwater quality.**
 - Case the borehole down to the top of the aquifer that is being used. This prevents surface water contamination, water loss from one aquifer to another, gas migration, and aquifer mixing.
 - Seal the space (annulus), between the casing and the side of the borehole with an appropriate grouting material from the top of the producing aquifer up to ground surface.
 - The production zone of the water well should take water from only one distinct water-producing unit. Multiple aquifer well completions can cause gas and water migration between aquifers.
3. **Properly decommission old water wells and well pits.** Many older wells are not adequately constructed to prevent contamination and mixing of water from different aquifers. The risk of contamination and mixing problems is increasing as old well casings corrode and rust out.

More Information

Alberta Agriculture and Rural Development agricultural water specialists can be contacted toll free through the Alberta Ag-Info Centre at 310-FARM(3276)

Prepared by

Alberta Agriculture and Rural Development