



COLORADO

Division of Water Resources

Department of Natural Resources

Board of Examiners of Water Well Construction
and Pump Installation Contractors

May 3, 2021

Bulletin 2021-1

POOR QUALITY WATER FROM COAL OR OTHER ZONES

Purpose

The purpose of this Bulletin is to:

- draw attention to water produced from aquifers containing coal, carbonaceous shale deposits, or other zones bearing poor-quality groundwater,
- distinguish "poor-quality" groundwater from "contaminated" groundwater, and
- to direct contractors and well owners to consult and agree on the option of sealing out, with solid casing and annular grout, coal or other poor-quality water bearing zones from the production interval.

Discussion

Naturally occurring, poor-quality water is not necessarily "contaminated" groundwater. However, when such water is introduced into or mixed with better quality water in other zones, the poor-quality water may degrade the quality of water in the aquifer as a whole and adversely impact the physical components and materials of the well. It is the responsibility of the licensed contractor to be familiar with those local aquifers or zones with the potential to have poor-quality water, including, but not limited to:

- the Greenhorn Limestone,
- coals within the Denver aquifer located in the Denver Basin, and
- the coals within the Laramie Formation, directly above the Laramie-Fox Hills aquifer, in the Denver and Cheyenne Basins.

Prior to completing a well, contractors should advise well owners of the possibility of penetrating coal or other zones containing poor-quality water and should provide well owners the option of having such water sealed out of the well. Contractors should know and explain potential contaminants and subsequent problems well owners may experience if poor-quality water is not sealed out of the well.



For example:

- higher sulfur content (corrosive to pipes, fittings and fixtures as H₂SO₄),
- dissolved hydrogen sulfide gas (H₂S, "rotten eggs"),
- and possibly methane gas (CH₄, explosive).

Contractors are also expected to suggest possible methods of treating the water and/or venting the gases as an alternative to sealing the water out of the well. However, it should be the well owners' decision as to which remedy is needed for their particular water uses.

Upon consideration of the cost of buying, installing, and maintaining water treatment equipment, and the continuous attention and periodic replacement required for filters, many well owners may elect to incur the "one time" expense of using solid casing and annular grout to seal out poor-quality water at the time of well construction, particularly if the well is for household or domestic use. In other instances, well owners may anticipate a water use that doesn't require water treatment (stock water, industrial uses, etc.) and therefore may elect to include water from the coal (or other) zone in the production interval of the well. Municipal well owners may already have treatment units incorporated into their water system and might prefer to screen as many productive units as possible. Regardless of the scenario, upon being informed of potential problems and remedies, it is ultimately the well owners' decision to either seal out the poor-quality water or to find alternative solutions.

Guidance

In conjunction with Rules 10.1.1 and 10.1.2 of the Water Well Construction Rules (2 CCR 402-2), prior to or during construction (if a poor water-quality zone was unexpected), the drilling contractor should advise the well owner that coal intervals or other units containing poor-quality water may be or have been penetrated by the borehole in the production zone of the aquifer. Consultation with well owners is necessary to determine if these intervals should be sealed-off in the production interval of the well. Such zones must always be sealed out of the well when they occur outside of the permitted aquifer interval (Rule 10.5).

Dated May 3, 2021



Keith Branstetter, Chairperson
Board of Examiners of Water Well Construction
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