

Hydraulic Fracturing in Alaska

The AOGCC's statutes and regulations, found in Chapter 5 of Title 31 of the Alaska Statutes and Title 20, Chapter 25 of Alaska's Administrative Code, apply to all oil, gas, and geothermal wells drilled in the state. These statutes and regulations include stringent well construction requirements that are designed to protect underground sources of water and ensure mechanical integrity during production and injection operations. The AOGCC has completed an extensive rulemaking process and has finalized specific regulations governing hydraulic fracturing for conventional oil, gas, and geothermal development. These regulations are codified at 20 AAC 25.283 and are effective January 7, 2015. The AOGCC is required by statute to take extra measures to protect underground sources of drinking water in "nonconventional gas" operations, including hydraulic fracturing operations. Non-conventional gas includes coal bed methane and shale gas, both of which usually require production and disposal of significant amounts of water to establish and maintain gas flow.

The AOGCC regulations specifically require disclosure of chemicals used in hydraulic fracturing fluids. A well that is proposed for hydraulic fracturing will be identified on a Permit to Drill application for a new well (Form 10-401) and the details given in an Application for Sundry Approvals (Form 10-403). Disclosure of the chemical composition and the anticipated volume of hydraulic fracturing fluid is required. In addition, Material Safety Data Sheets are required by federal law to be available on location and in transit. For hydraulic fracturing operations, these sheets list every chemical used in the fracturing process and they must be disclosed to the AOGCC and any emergency personnel if requested. In instances where hydraulic fracturing is proposed in an Application for Sundry Approvals (Form 10-403) volumes may be estimated based on completion interval thickness, permeability and other characteristics. The volume and chemical composition of the hydraulic fracturing fluid actually used must be disclosed in the final completion report that is submitted to the AOGCC for each fractured well. Operators are also required to post the well information and chemical disclosure to www.fracfocus.org, a publicly searchable database.

On the North Slope, Alaska's most prolific oil and gas province, freshwater is not a concern. In this part of Alaska, a thick layer of soil is underlain by permafrost – ground that remains frozen year round – so there is no liquid water, other than surface water, to a depth of 1000 to 2000 feet. Below the permafrost, only salt water is present, with very few exceptions. Regardless, wells on the North Slope are held to the same stringent statewide construction requirements.

Wherever underground sources of drinking water are present, they are protected by AOGCC regulations. All operators are required to obtain advance approval for well work, including drilling. Mechanical integrity requirements are the primary means for protecting drinking water. In order to operate, all wells must demonstrate competent barriers to prevent the flow of any fluids from the well to the surrounding rocks. These barriers are supplied by strings of pipe in the wells as well as cement and mechanical devices that pack-off (*i.e.*, seal) the pipe. Every well must have a surface casing that is

set below the base of the deepest formation that could potentially be a source of drinking water. That casing must be cemented completely to the surface. As a well is drilled deeper, every additional casing string must also be cemented sufficiently to restrict fluids to their native reservoirs. Wells which cannot demonstrate competent barriers are required to be shut-in immediately.

To assure compliance, every operator is required to install pressure measurement devices on every well and monitor those devices daily. If a measurement device indicates a compromise of mechanical integrity, the operator is required to shut-in the well immediately and to notify the AOGCC. In addition to these measurement devices, the AOGCC requires periodic mechanical integrity tests on all wells. The AOGCC has a total of seven field inspectors who randomly witness the tests as they are performed. Regardless of whether or not an inspector is present for a pressure test, operators are required to submit to the AOGCC documentation for every test conducted. All test information is reviewed thoroughly by AOGCC engineers. Unannounced inspections also assure regulatory compliance.

In over fifty years of oil and gas production, Alaska has yet to suffer a single documented instance of subsurface damage to an underground source of drinking water. As long as each well is properly constructed and its mechanical integrity is maintained, hydraulic fracturing should have no potential to damage any freshwater.