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BLM Fracking Rules and Water Supply

by [Jeremy Brown](#) July 20, 2013

The Bureau of Land Management (BLM) currently regulates hydraulic fracturing (fracturing) through a rule that was adopted three decades ago and last revised in 1988. 43 C.F.R. § 3160. Because of its age, the existing rule does not account for the risks or opportunities that have resulted from innovations in horizontal drilling and fracturing technology.

Yet BLM controls significant shale resources. The agency manages 700 million subsurface acres of onshore federal mineral estate and 56 million subsurface acres of Indian mineral estate. By one [estimate](#), the agency "has the power to regulate the roughly 6 percent of domestic onshore oil production and 13 percent of onshore natural gas production." As much as 90 percent of wells currently being drilled on BLM lands use some type of fracturing technique.

To update its regulations, recently released a [revised proposed rule](#) (the Revised Rule) for hydraulic fracturing on federal and Indian lands. The Revised Rule amends a rule that the agency proposed last year (the [Original Rule](#)) and that received more than [177,000 comments](#).

Initial stakeholder response to the Revised Rule has followed the typical pattern. Environmental NGOs have claimed the Revised Rule is too lax and weaker even than the Original Rule. (For examples, see [Earthworks](#) and [NRDC](#).)

Industry groups have claimed the rules are unnecessary and too stringent. ([America's Natural Gas Alliance](#) has argued that states should be given the lead role in regulating fracturing, the [American Petroleum Institute](#) has gone so far as to question the need for new BLM regulations in light of existing state regulations.)

This post surveys the notable provisions of the Revised Rule, with an emphasis on water supply (as opposed to water quality) issues.

Scope of the Revised Rule: The Original Rule would have regulated all "well stimulation," which was defined to mean "those activities conducted in an individual well bore designed to increase the flow of hydrocarbons from the rock formation to the well bore through modifying the permeability of the reservoir rock. Examples of well stimulation operations are acidizing and hydraulic fracturing." Original Rule, 43 C.F.R. §§ 3160.0-5, 3162.3-3(a).

The Revised Rule narrows its application to "hydraulic fracturing," meaning "those operations conducted in an individual wellbore designed to increase the flow of hydrocarbons from the rock formation to the wellbore through modifying the permeability of reservoir rock by fracturing it. Hydraulic fracturing does not include enhanced secondary recovery such as water flooding, tertiary recovery, recovery through steam injection, or other types of well stimulation operations such as acidizing." Revised Rule, 43 C.F.R. §§ 3160.0-5, 3162.3-3(a).

Type Well: Both the Original Rule and the Revised Rule require an operator to provide a significant amount of information with the sundry notice. In many ways, it is the heart of the rules, the principal mechanism through which an operator complies.

The Original Rule required an operator to submit a notice of sundry intent for each proposed operation. Original Rule, 43 C.F.R. § 3162.3-3(c). The Revised Rule allows an operator to submit one sundry notice for a single well or a group of wells within the same geologic formation. If the sundry notice is for a group of wells, they must share a "type well." Revised Rule, 43 C.F.R. § 3162.3-3(d). A type well is defined as "an oil and gas well that can be used as a model for well completion in a field where geologic characteristics are substantially similar within the same field, and where operations such as drilling, cementing, and hydraulic fracturing are likely to be successfully replicated using the same design." Revised Rule, 43 C.F.R. § 3160.0-5 (d).

Chemical Disclosure: The Original Rule required operators to disclose all additives to stimulation fluids and the complete chemical makeup of all materials used in stimulation fluids. Original Rule, 43 C.F.R. §§ 3162.3-3(g)(4), 3162.3-3 (g)(5). At the time of disclosure, however, operators could identify information they believed was exempt from disclosure under federal statutes and regulations such as the Trade Secrets Act. Original Rule, 43 C.F.R. § 3162.3-3(g)(i).

The Revised Rule is modeled after Colorado's [state-level regulations](#) and expands this protection. An operator does not have to disclose trade secreted information – to the public or to BLM – so long as it submits an affidavit to the agency that: (1) identifies the federal statute or regulation that entitles the operator to withhold the information; (2) affirms that the information is not publicly available; (3) affirms that the information is not required to be publicly available under any applicable law; (4) affirms that disclosure would harm the operator's competitive position; and (5) affirms that the information cannot be readily reverse engineered. Revised Rule, 43 C.F.R. § 3162.3-3(l)(1).

The agency may require an operator to disclose any exempted information to it while continuing to protect that information from public disclosure. Revised Rule, 43 C.F.R. § 3162.3-3(l)(2). If BLM determines the information does not qualify for this exemption, the operator must provide the operator with at least 10 days' notice of its determination and then make the information publicly available. Revised Rule, 43 C.F.R. § 3162.3-3(l)(3).

Operators must retain exempt information for at least six years, the retention period currently mandated for well records for BLM onshore oil and gas operations under the existing 43 CFR 3162.4-1(d). Revised Rule, 43 C.F.R. § 3162.3-3(l)(3).

Usable Water Definition: Current regulations require operators to "isolate freshwater-bearing and other usable water containing 5,000 ppm or less of dissolved solids and other mineral-bearing formations and protect them from contamination." 43 C.F.R. § 3162.5-2(d).

The Original Rule would have defined the term "usable water" more broadly, to include water containing up to 10,000 ppm of total dissolved solids – a standard that better reflects Western water scarcity and water management practices. Original Rule, 43 C.F.R. § 3160.0-5. (As a point of comparison, the Safe Drinking Water Act defines an "underground source of drinking water" as an aquifer with fewer than 10,000 mg/l total dissolved solids. 40 C.F.R. § 144.3.)

The Revised Rule builds on this definition by clarifying that it does not encompass all water containing up to 10,000 ppm. Rather, water must meet the 10,000 ppm threshold and be found in one of four types of geologic zones deemed to contain usable water and not in one of three types of geological zones deemed *not* to contain usable water. Revised Rule, 43 C.F.R. § 3160.0-5.

Geologic Zones Deemed to Contain	Geologic Zones Deemed Not to Contain
Underground sources of drinking water as defined by the EPA or state or tribal law.	Zones from which an operator is authorized to produce hydrocarbons.
Zones in use for supplying water for agricultural or industrial purposes, regardless of the concentration of total dissolved solids, unless the operator demonstrates that the existing agricultural or industrial user would not be adversely affected.	Zones designated as exempted aquifers pursuant to the Safe Drinking Water Act.
Zones designated by a state or tribe as requiring isolation or protection from oil and gas operations	Zones which a state or tribe has designated as exempt from any requirement to be isolated or protected from oil and gas operations.
Zones containing up to 10,000 ppm of total dissolved solids that are not otherwise excluded.	

With this new definition of "usable water," the Revised Rule modifies 43 C.F.R. § 3162.5-2(d) to require that an "operator must isolate all usable water and other mineral-bearing formations and protect them from contamination." In addition, to make clear the scope of this provision, it adds a new provision not found in the Original Rule, as 43 C.F.R. § 3162.3-3(b), which mandates that "[a]ll hydraulic fracturing and refracturing operations must meet the performance standard in section 3162.5-2(d)."

Cement Bond Logs: The Original Rule required an operator to submit, with its sundry notice, a [cement bond log](#) (CBL) "or another log acceptable to [the agency]." The purpose of the CBL was to prove that the operator would protect usable water from contamination. Original Rule, 43 CFR § 3162.3-3(c)(2).

The Revised Rule allows an operator to submit a cement evaluation log (CEL) *after* completing operations rather than a CBL before, as long as the CEL is as effective as a CBL would have been. The Rule defines a CEL as "a class of tools that verify the integrity of annual cement bonding, such as, but not limited to, a [CBL], ultrasonic imager, variable density logs, micro-seismograms, CBLs with directional receiver array, ultrasonic pulse echo technique, or isolation scanner." Revised Rule, 43 CFR § 3162.3-3(e)(2).

Water Supply: Fracturing uses a lot of water. API estimates each operation requires two to four million gallons. Like most industry-side advocates, API argues that while such numbers may seem large on their face, they "generally represent a very small percentage of total water use in the areas where fracturing operations occur."

The use of water for fracturing is often consumptive, however. Unlike water that is used for irrigating golf courses or cooling electric plants, for instance, the water used for fracturing is used completely. It is generally considered waste and isolated from usable surface and groundwater resources. As a result, there is little if any return flow to a basin.

Use of water for fracturing puts added pressure on water supplies, particularly in arid regions. A recent Ceres [study](#) found that, of 25,000 shale oil and gas wells in operation between January 2011 and September 2012, 47 percent were in water basins experiencing high or extremely high levels of water stress.

Indeed, even water that operators do not directly use but that returns to the surface as a byproduct of the fracturing process – produced water – can reduce groundwater reserves.

The Colorado Supreme Court has held, in the context of coal bed methane (CBM), that produced water from "tributary groundwater" (which is deemed hydrologically linked to surface water supplies) constitutes a beneficial use and requires a permit under the states' appropriative water system.

(The hydrological impacts of produced gas have received more attention in the context of coal bed methane (CBM) than fracturing because CBM generally results in greater amounts of produced water, but the dynamic is similar.)

Along these same lines, in a dispute between Montana and Wyoming, a special master found that CBM operations in Wyoming would violate the Yellowstone River Compact if the produced water depleted Montana's entitled surface flows.

To minimize effects on "publicly utilized water resources," API encourages operators to use non-potable water and to reuse and recycle water. API Energy, Water Management Associated with Hydraulic Fracturing (June 2010).

With current technology, fracturing byproduct that cannot be recycled to drinking quality standards, but it can be cleaned thoroughly enough to allow for its reuse in subsequent fracturing operations. Existing on-site technologies have been shown capable of restoring 70 to 80 percent of flowback and produced water to potable standards. Congressional Research Service, Marcellus Shale Gas: Development Potential and Water Management Issues and Laws.

And for economic reasons (procuring and disposing of water can be expensive), recycling is becoming an increasingly attractive option for operators. Technological improvements have made recycled water more [cost-competitive](#) on the front-end with water from other sources and on the back-end with disposing of water waste through other methods like underground injections. (Devon, in particular, has received attention for its water recycling efforts.)

In November 2012, the Wall Street Journal [reported](#) that 14 percent of water being used for fracturing operations in central Pennsylvania was recycled, compared to less than 1 percent two years before. And in May, the Texas Railroad Commission adopted [rules](#) that facilitate recycling by allowing operators to recycle on-lease or transfer to another operator's lease without obtaining a permit.

Against this policy backdrop, the Revised Rule includes two provisions that – apart from separate provisions concerning water quality – could help water managers to track fracturing water consumption and its impact on area resources.

First, the Revised Rule requires an operator to include in its sundry notice an estimate of the total volume of fluid that will be used in an operation. Revised Rule, 43 CFR § 3162.3-3(d)(4). While this provision does not require an operator to estimate the total amount of water used, fracturing fluids typically consist of 98 to 99 percent water. Fluid use can thus serve as a reliable proxy for water use.

Texas fracturing regulations call for a similar disclosure, requiring operators to provide "the total volume of water used in the hydraulic fracturing treatment(s) of the well or the type and total volume of the base fluid used in the hydraulic fracturing treatment(s), if something other than water." 16 TAC § 3.29(c)(2)(A)(viii).

Second, the Original Rule required the sundry notice to include "[i]nformation concerning the source and location of water supply, such as reused or recycled water, or rivers, creeks, springs, lakes, ponds, and wells." Original Rule, 43 CFR § 3162.3-3(c)(3). The Revised Rule amends this requirement by specifying that "reused or recycled water" may serve as a source. Revised Rule, 43 CFR § 3162.3-3(d)(3).

Flowback Fluids and Waste Disposal: Both the Original Rule and Revised Rule require an operator to submit, with its sundry notice, a plan for handling and disposing of waste fluids recovered during flowback, swabbing or other recovery procedures. Original Rule, 43 CFR § 3162.3-3(c)(6); Revised Rule, 43 CFR § 3162.3-3(d)(5).

In addition, the Original Rule and the Revised Rule contain identical language regarding the disposal of recovered fluids: "Storage of all recovered fluids must be in either tanks or lined pits. The authorized officer may require any other BLM approved method to protect the mineral resources, other natural resources, and environmental quality from the release of recovered fluids." Original Rule, 43 CFR § 3162.3-3(f); Revised Rule, 43 CFR § 3162.3-3(h).

In its prologue to the Revised Rule, the agency summarized the comments it had received in response to this provision in the Original Rule. It said some commenters argued that pits: (1) increase the risk of accidental discharges, failures and seepage; (2) must be fenced to exclude wildlife; and (3) would cause air pollution. These commenters recommended that pits be double-lined and equipped with leak detection systems or be prohibited altogether. The agency said it shared these concerns but that its separate [instruction memorandum](#) for open pits established standards that would protect livestock and wildlife.

Other commenters said the disposal requirements duplicated existing state requirements or were not necessary in light of [Onshore Order No. 7](#), which regulates the disposal of produced water from BLM oil and gas leases. The agency said the order would be inappropriate for fracturing because it "allows disposal of produced water in unlined pits in certain circumstances. The BLM does not believe that storage of hydraulic fracturing flowback fluids in unlined pits is appropriate because of the far greater volume of flowback fluids compared with typical volumes of produced water, and because of the chemical constituents of flowback fluids may pose different or increased risks if they come into contact with surface water or groundwater."

The BLM noted that "most States require flowback fluids to be stored in lined pits or tanks. One State, California, requires storage in tanks, and another, New Mexico, allows lined pits to be approved as a variance from requiring storage in tanks. It also appears that some States, such as Texas and Oklahoma, are encouraging the use of mobile recycling systems." The agency said the provision would not preempt more state tank-only regulations or efforts to promote recycling systems.

Variations: In response to concerns about duplicative state/Tribal and federal reporting requirements, the Revised Rule allows operators to request variances. If BLM determines the proposed alternative meets federal standards, it may issue a variance for all wells within a particular state or tribal land, or for specific fields or basins. Revised Rule, 43 C.F.R. § 3162.3-3(i).

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