



WEST VIRGINIA RIVERS COALITION

3501 MacCorkle Ave. SE #129 • Charleston, WV 25304 • (304) 637-7201 • www.wvrivers.org

July 27, 2015

Jason Harmon, Office of Oil and Gas
Department of Environmental Protection
601 57th Street S.E.
Charleston, WV 25304

Comments on §35CSR8 Proposed Rules Governing Horizontal Well Development

(Submitted via Email to Henry.J.Harmon@wv.gov)

Dear Mr. Harmon,

Please accept the following comments on the Office of Oil and Gas's (OOG) proposed changes to the rules governing horizontal well development.

We support, and these comments are intended to reinforce, the technical comments of The West Virginia Surface Owners' Rights Organization (WV-SORO) and of George Monk and Molly Schaffnit.

In general, we support many of the proposed changes to the rule and commend the agency for its efforts to fill in the gaps in areas such as drilling in karst terrain/areas, promotion of closed-loop systems, and procedures for investigation of migration.

However, we are disappointed that, with the exception of some changes to the sections of the rule regarding construction of centralized pits and impoundments, the agency did not take advantage of this opportunity to implement any of the recommendations mandated by the Act.

We offer the following comments (that reinforce input provided by WV-SORO et. al.) relating to the rule's potential in better protecting water supplies from impacts of horizontal well development activities:

§35- 8 -2.15. "Karst terrain" definition.

The defined term "karst terrain" does not appear anywhere in the rule. Also, the definition uses the word "topography," which generally refers to features on the surface rather than

geologic substrata. We suggest that the rule define “karst region” as an area of the state, generally underlain by limestone ... in which the subterranean features are formed”

§35- 8 -5.1.i. Karst region testing.

We support the requirement that testing to be conducted to identify caves and other subterranean features in karst regions be determined and approved by the West Virginia Geologic and Economic Survey. However, we believe that the rule needs to go further and require study and experimentation with drilling techniques before it is permitted in karst areas.

§35- 8 -5.3.e. Notice provisions for permits in karst regions.

We support the requirement that operators applying for permits in karst regions provide notice to the West Virginia Cave Conservancy and the West Virginia Speleological Society either prior to or at the time of filing the application with the OOG. Ideally, notice should be given to these organizations prior to the permit being filed so that they have ample opportunity to provide input and share their knowledge and expertise regarding the protection of these sensitive regions.

§35- 8 -5.5.C.9. Compaction, acceptable moisture range requirements for embankments.

We support the minimum compaction requirements for embankments and the requirement for soil tests to determine an acceptable moisture range.

§35- 8 -5.6.b.6. and 5.6.d. Water Management Plans: Aquifer testing and use of aquifer test data to evaluate appropriateness of water withdrawal rates.

We support the requirement that water management plans include an aquifer test to demonstrate the feasibility of using a water supply well for groundwater withdrawals. We also support the agency’s review and use of the aquifer test data to evaluate the appropriateness of water withdrawal rates and maintain minimum stream flow.

§35- 8 -5.6.e. Water Management Plans: Signage at water withdrawal locations.

We support the additional signage requirements for water withdrawal locations and the inclusion of the phone number for the OOG.

§35- 8 -5.6.f. Water Management Plans: Wastewater storage.

We support the requirement that wastewater generated from drilling, fracturing, stimulation and production being re-used for similar purposes at another location must be stored in tanks or in centralized pits subject to more detailed and stringent design and construction standards and operational criteria. In particular, we appreciate the transition to pitless or closed-loop drilling systems and that open pits will no longer be used to store drilling waste on site.

§35- 8 -5.11. Area of Review.

We support and appreciate the addition of this requirement to investigate existing active, plugged and abandoned wells surrounding the proposed well to identify and evaluate potential conduits for fracture propagation and help prevent gas migration. Gas migration can occur because of problems with fracturing, because of initial problems with casing and cementing, and because of deterioration of casing and cementing of existing and new wells over time. The Office needs to investigate and determine the cause of gas migration (including contamination of drinking water supplies, not just “plugged” wells venting) if it occurs, but it’s more important to put in place pro-active measures to evaluate existing nearby wells (active, plugged and abandoned) to prevent migration from happening in the first place.

§35- 8 -9.1.a.4. and 9.1.a.5 Water supply wells: Aquifer test and drinking water well testing.

In addition to registering the wells, we support and appreciate the proposed requirement to conduct a detailed aquifer test to ensure that groundwater resources are adequate and that proposed withdrawals from water supply wells will not adversely impact water resources. However, section 9.1.a.4. of the rule uses the phrase “without significant adverse impact.” This suggests that some adverse impacts to water resources are acceptable. Our position is that efforts should be made to avoid any adverse impacts.

We also strongly support the requirement that all drinking water wells within 1,500 feet of a water supply well be flow and quality tested by the operator upon request of the drinking well owner and the specifications for how the flow test will be conducted. In the first sentence of section 9.1.a.5. there appears to be a stay “or” after “All drinking water wells.” Was it the intention to also include developed springs? If so, we would support this addition to the rule.

We have some additional comments and questions regarding how a drinking well owner would know to request the testing, as there is no requirement in statute or rule that they be notified about the drilling of the supply well (see comments on §35- 8 -15.1. and 15.2 below.)

§35- 8 -9.1.b.2. Signage for water withdrawal locations.

Regarding signage at water withdrawal locations, this section and/or section 5.6, which also addresses signage should be amended so that they are consistent with each other. For example, section 5.6. say the signage shall include the website address for the Office, but this is not mentioned in section 9.1.b.2. Additionally, section 5.6 says the signage shall include “the telephone number of the company conducting the withdrawal” while section 9.1.b.2. says the “telephone number for the operator for which the water withdrawn will be utilized.” Since the

company conducting the withdrawal may not be the well operator, both should be required at both places.

§35- 8 -9.1.b. Baseline water testing in karst regions.

We support the requirement that baseline water quality testing be conducted in karst regions prior to commencement of any site construction or well work. Because water resources in karst regions could more easily be disrupted by drilling or surface disturbances than water resources in other areas of the state, these resources should also be flow tested.

§35- 8 -9.2.c.3. Conductor drilling fluid.

Conductor boreholes are so shallow that they do not need to put anything but fresh water down the hole.

§35 - 8 - 9.2.d.2. Freshwater casing standards; Use of additives, risk of damage.

We appreciate the requirements to drill the freshwater casing well bore using only air, fresh water or freshwater based drilling fluids. However, we do not know what a freshwater-based drilling fluid is. We presume that is drilling mud. Because there is no casing that is cemented in, this is well known to be the most common time for groundwater pollution to occur. Therefore, we oppose any additives being allowed.

We are concerned about language that says the operator shall use, “practices that minimize damage or disturbance or the possibility of unnecessary damage or disturbance to the uncased strata/formations and groundwater....” We do not think damages should be minimized, they should be prevented. The risk of damage should be minimized, not the damage itself.

Similarly, “unnecessary damage or disturbance” seems to assume that damage may be necessary. We do not accept that assumption. There should be no damage to groundwater except perhaps temporary drainage out of a suspended water table into the borehole.

We support the proposed prohibition on using additives in karst regions when drilling the wellbore for the fresh water casing. We also support the requirement that a cement basket or similar device be used to allow for cementing of the annular space when a well is drilled through a cave void.

§35 - 8 - 9.2.d.10., 9.2.e.5., and 9.2.f.2. Formation Integrity Testing (FIT).

We support the new provisions indicating that a Formation Integrity Test (FIT) may be required by the Chief after the setting of the fresh water protection, coal seam and intermediate casings to establish cement and formation integrity. While this is definitely an improvement to the

current casing and cementing standards, FIT should be mandatory, at least for the fresh water casing, rather than leaving it to the discretion of the Chief. In fact, the American Petroleum Institute (API) recommends the FIT tests for all wells that are hydraulically fractured. We think a bond log should be run on every well – again at least for the surface casing. We understand that the rule contains a number of provisions that are designed and intended to result in a protective casing properly cemented through the fresh water zones. However, nothing in the rule requires a check to see if the goal has been accomplished.

§35- 8 -9.2.h.7. Notification of cementing operations.

The most crucial action for the protection of groundwater is the cementing of the fresh water casing. The most common violation of cementing standards by operators is to fail to wait long enough for the cement to harden before the operator starts drilling again – therefore causing many mini-annuli in the cement job. This provision wisely requires the operator to give notice of the commencement of any casing installation to the inspector.

§35- 8 -9.2.j. Monitoring for leaks and deterioration.

In addition to annual inspections, there should be mandated monitoring for and reporting of leaks and deterioration of casings over time. The current language only requires the operator to conduct an inspection at the surface but does not specify that any type of integrity test be conducted.

§35- 8 -9.2.k. Results of tests should also be available for interested parties.

Surface owners and other interested parties should have access to these tests.

§35 - 8 - 9.3. Closed-loop drilling systems.

We strongly support and appreciate the transition to pitless or closed-loop drilling systems and that open pits will no longer be used to store drilling waste on site or within the permitted limit of disturbance.

§35- 8 -9.4. Monitoring of potential conduits for unintended fracture propagation, communication.

We support and appreciate the addition of this section requiring operators to identify and monitor potential conduits for unintended fracture propagation during the hydraulic fracturing process, and to cease operations if pressures indicate communication has occurred. As noted previously, gas migration can occur because of problems with fracturing, because of initial problems with casing and cementing, and because of deterioration of casing and cementing over time. It is important to monitor potential conduits for unintended fracture propagation to determine if communication or gas migration has occurred, which should also be part of the

rule, but it's more important to put in place pro-active measures to evaluate existing nearby wells (active, plugged and abandoned) to prevent communication (and especially contamination of drinking water supplies) from happening in the first place.

§35- 8 -12.2. Access roads and sedimentation.

Access roads should be constructed and maintained to prevent any sedimentation, not "minimize" sedimentation.

§35- 8 -12.3. Well sites and sedimentation.

Well sites should be constructed and maintained to prevent any sedimentation, not "excessive" sedimentation.

§35- 8 -12.4. Pits and Impoundments Associated with a Well Work Permit.

We support and appreciate that under the proposed rule drillers must use closed-loop drilling systems and that the use of open, on-site pits associated with a well work permit would be eliminated. In keeping with this change, language related to the pits that would no longer be allowed is removed from this section. However, we are concerned about existing permits and pits allowed under permits issued prior to the effective date of the proposed changes. This section (and other sections of the rule pertaining to pits associated with a well work permit) should be written so it is clear that existing/previously permitted pits must meet the requirements specified in the rule, must have proper inspections, must be properly reclaimed and waste stored in the pits must be disposed of properly.

We support the prohibition on construction of impoundments in karst regions.

§35- 8 -15. Water Supply Testing.

We strongly support the requirement that all drinking water wells within 1,500 feet of a water supply well be flow and quality tested by the operator upon request of the drinking well owner.

Testing and presumption of liability should include possible pollution from the lateral/horizontal legs of the well bore.

§35- 8 -15.3.b. Water testing parameters.

We recommend that the following should be added to the list of testing parameters:

-Magnesium, Lead, Strontium, and Potassium: Metals that can help determine whether water quality has been impacted by fracturing fluid or brine (in addition to the other metals

on the list). Also, Potassium in particular has been proposed as a possible tracer for fracturing fluid contamination.

-Acrylonitrile: An ingredient in fracturing fluid and therefore a possible signature of pollution from fracturing fluid.

-Acidity, Alkalinity, Hardness: General water chemistry parameters that help provide a general characterization of the water. In addition, some surface water quality criteria are hardness-dependent.

-Gross alpha, Gross beta, Radium-226, Radium-228: Radiological parameters that can help determine whether naturally occurring radioactive materials (NORMs) have made it to the surface. The Department's own sampling has confirmed the presence of NORMs in wastewater from Marcellus Shale wells.

The lack of metals testing is curious since the EPA names them as a test parameter on this page (<http://water.epa.gov/drink/info/well/faq.cfm>) for when there are gas drilling operations nearby. Lead and the other heavy metals are also listed in an academic study: Swistock, Bryan. 2008. Gas Well Drilling and Your Private Water Supply, Water Facts #28. University Park, PA: The Pennsylvania State University, College of Agricultural Sciences, Cooperative Extension, School of Forest Resources. <http://resources.cas.psu.edu/WaterResources/pdfs/gasdrilling.pdf>.

§35- 8 -15. Replacement of water supplies.

The rule should include procedures for requiring the operator to replace water supplies that are contaminated, diminished or interrupted by oil and gas operations as specified by the W.Va. Code §22-6A-18.

§35- 8 - 17. Construction of Centralized Pits and Impoundments.

We commend the OOG for proposing additional safeguards for centralized pits that store waste generated by natural gas drilling operations and the steps the OOG has taken in this rule to reduce the use of pits and the problems associated with them. More detailed and stringent design and construction standards and operational criteria for all pits and impoundments are long overdue. However, drilling pits are not necessary and their use poses an unnecessary risk to human health and the environment, no matter how well they are constructed. ***We strongly encourage the Department to eliminate the use of pits for the storage of drilling and hydraulic fracturing fluids and other drilling waste.***

Absent a strict prohibition on the use of pits, we appreciate that the proposed design and construction standards impose restrictions on where centralized waste pits can be located. We also appreciate that the standards acknowledge the threats pits pose to surface and ground water by requiring dual liners with leak detection and requiring companies to install water quality monitoring wells near the pits. Nevertheless, we have identified a number of shortcomings with the proposed standards. The following comments are drawn from WV-SORO's 2012 comments on the OOG's Design and Construction Standards for Centralized Pits, on which many of the additions to these sections appear to be based. These comments were prepared with the input of surface owners who have experienced problems with pits, including torn liners and leaking of potentially toxic liquids into soils, surface water and groundwater.

§35- 8 -17.2.a. Siting Requirements.

We appreciate the proposed siting restrictions. Such restrictions are long overdue, and we particularly applaud the prohibition of locating pits in karst areas.

Adequate setbacks are needed for the protection of all water supplies (public and private).

While the proposed standards place restrictions on the location and construction of pits relative to perennial streams, consideration should also be given to construction around or the filling of intermittent or ephemeral streams.

§35- 8 -17.2.g. Monitoring.

We appreciate the water quality monitoring provisions of the proposed standards, keeping in mind residents in rural areas who rely on groundwater aquifers for their drinking water. However, in addition to establishing monitoring wells to monitor general groundwater quality over the life of the pits, the standards should also require evaluation of baseline water quality of nearby water wells and developed springs.

§35- 8 -17.2. g.4. Data Analysis, Water Sampling and Testing Parameters.

The proposed standards require the collection of water samples once per calendar quarter. A more frequent sampling schedule would be more meaningful. Conductivity and pH in particular can be easily measured in the field and relatively inexpensive monitors (compared to the cost of establishing the monitoring well) can be deployed to measure and record these parameters on a continuous basis.

Although the minimum parameters are good indicators of possible contamination, they are not regulated by primary drinking water standards. The list of testing parameters should be expanded to include constituents such as heavy metals, chemicals or chemical compounds used

in hydraulic fracturing and naturally occurring radioactive materials (NORMs) known to exist in the Marcellus Shale – constituents DEP's own sampling has shown are present in drilling wastewater.

At a minimum, non-seasonal changes in the parameters specified in the proposed standards should immediately trigger additional sampling and more extensive testing for heavy metals, BTEX and radioactivity. If changes occur, owners of nearby drinking water wells and springs should be notified immediately, and their wells and springs should be sampled and tested for potential contaminants.

§35- 8 -17.5.b. Conformance with Plans, Engineer Certification

We support the additional certification requirements in this section to help ensure that pits and impoundments are constructed in accordance to plan.

§35- 8 -18.3. Spill Pollution Prevention and Control Measures.

This section is permissive on the use of "linings, feltings, paddings, and support boardings of adequate quality." The use of these prevention and control measures should be required ("shall use" rather than "may utilize"). And all the plans should be submitted to the State, not just in the event of prior problems.

Thank you for the opportunity to provide comments on the rule.

Angie Rosser
Executive Director
West Virginia Rivers Coalition