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Hon. Mary Jo White
Senate Environmental Resources and Energy Committee
169 Capitol Building
Harrisburg, PA 17120

Cc: Senate Environmental Resources and Energy Committee Members

Re: PennEnvironment's Comments on Marcellus Shale Natural Gas Wastewater Treatment Issues, January 27, 2010

Good morning. My name is Erika Staaf, and I'm the Clean Water Advocate for PennEnvironment. PennEnvironment is a non-profit, citizen-based environmental advocacy organization. I'd like to start out by thanking Chairwoman White and the members of the Senate Environmental Resources and Energy Committee for inviting me to testify today on the important issue of Marcellus Shale wastewater treatment.

Summary

Drilling in the Marcellus Shale gas reserve is moving forward in Pennsylvania at a rapid pace. While drilling for gas in the vast shale deposits here in the Commonwealth presents us with many opportunities, it also comes with new and significant challenges, not the least of which is how to deal with the wastewater this drilling produces.

In November of 2009, state environmental officials proposed amendments to the Pa. Code Chapter 95 to address wastewater treatment requirements. PennEnvironment applauds DEP for moving forward with this action to set new effluent standards and believes the proposed amendments will be an important step in ensuring that Pennsylvania's rivers and streams remain clean and safe, and that drinking water sources throughout the Commonwealth are protected.

However, we would suggest some important improvements and points of clarification that can be applied both to this particular standard as well as a broader wastewater plan for the Commonwealth. These points center around a six main categories: 1) the Total Dissolved Solids (often referred to as "TDS") standard; 2) new and existing discharges; 3) standards for additional contaminants; 4) wastewater monitoring; 5) wastewater re-use; and 6) the cost of implementation of these standards.

Total Dissolved Solids (TDS) Standard

Total Dissolved Solids are a measurement of inorganic salts, organic matter and other dissolved materials in water, and may contain contaminants such as toxic metals and organic pollutants.¹ In response to analyses performed by DEP demonstrating that many of Pennsylvania's rivers and streams have limited capacity to handle additional TDS, Sulfates and Chlorides because of elevated levels from existing sources, the Department proposed new effluent standards (500 mg/L for TDS, and 250 mg/L for each for Sulfates and Chlorides). DEP has recognized that hydraulic fracturing in the Marcellus Shale has the potential to generate large volumes of wastewater high in dissolved solids,² and PennEnvironment therefore believes it is critical for the overall health of Pennsylvania's waterways that any wastewater standards implemented include DEP's strong proposed standards for TDS. We believe that these standards should go into effect as soon as possible, but believe that DEP's proposed date of January 1, 2011 is acceptable.

One way to further ensure protection of the Commonwealth's waterways is to set the TDS effluent standard and concentration threshold as a daily maximum, not a monthly average as is currently being proposed in the draft regulation. This will prevent large swings in contaminant loads that could be detrimental to water quality in rivers and streams.

New and Existing Discharges

In order to protect all of Pennsylvania's waterways, PennEnvironment believes all plants coming on line should fully meet the effluent standards proposed by DEP. These standards should be implemented as soon as possible since Pennsylvania is currently allowing facilities release TDS pollution above and beyond the standard that DEP is proposing.

Additional Contaminants

PennEnvironment believes it is critical to include health-based standards for a number of contaminants that have been found in Marcellus wastewater but that are not currently included in the DEP proposal. These include but are not limited to:

- Bromides, or brominated disinfection by-products (DBPs), that can be toxic and carcinogenic to humans.³
- Arsenic, which has been linked to many forms of cancer and can cause other serious health effects,⁴ and is often found in Marcellus wastewater.⁵
- Benzene, a known carcinogen found in fracking fluids.⁶
- Radium, a potent carcinogen that has been found in Marcellus wastewater.⁷

¹ Pennsylvania Department of Environmental Protection (PA DEP). November 7, 2009. "Proposed Rulemaking, 25 Pa. Code Ch. 95, Wastewater Treatment Requirements."

² "Estimates from the industry indicate that demand for brine water treatment in Pennsylvania will reach approximately... 19 Million Gallons per Day in 2011." From PA Department of Environmental Protection. April 11, 2009. "Permitting Strategy for High Total Dissolved Solids (TDS) Wastewater Discharges. Accessed online at: <http://www.portal.state.pa.us/portal/server.pt?open=512&objID=14295&mode=2&PageID=590867>.

³ Kilduff, James E., Karanfil, Tanju. March 1, 2003. "Brominated DBP Formation and Speciation Based on the Specific UV Absorbance Distribution of Natural Waters. *U.S. Environmental Protection Agency*. Accessed online at: <http://cfpub.epa.gov/ncer/abstracts/index.cfm/fuseaction/display.abstractDetail/abstract/820/report/F>.

⁴ U.S. Environmental Protection Agency website, updated Sept. 14, 2006. "Arsenic in Drinking Water." Accessed online at: <http://www.epa.gov/safewater/arsenic/index.html>.

⁵ Lustgarten, Abrahm. Aug. 25, 2009. "EPA: Chemicals Found in Wyo. Drinking Water Might be From Fracking." *ProPublica*. Accessed online at: <http://www.propublica.org/feature/epa-chemicals-found-in-wyo.-drinking-water-might-be-from-fracking-825>.

⁶ Pennsylvania Department of Environmental Protection (PADEP). 2008. "Summary of Hydraulic Fracturing Solutions – Marcellus Shale." Accessed online at: <http://www.dep.state.pa.us/dep/deputate/minres/oilgas/FractListing.pdf>. "Benzene and other toxic constituents are generally present in all petroleum distillates including diesel fuel," from Environmental Working Group. January 2010. "Drilling Around the Law."

⁷ Lustgarten, Abrahm. Nov. 9, 2009. "Natural Gas Drilling Produces Radioactive Wastewater." *ProPublica*. Accessed online at: <http://www.scientificamerican.com/article.cfm?id=marcellus-shale-natural-gas-drilling-radioactive-wastewater>.

Wastewater Monitoring

PennEnvironment believes that transparency is crucial in order for DEP and the public to be able to determine that Pennsylvania's waterways are safe and clean. There should be a "cradle to grave" monitoring system in place for wastewater generated by Marcellus drilling operations, requiring complete tracking of wastewater fluids at all stages of use. DEP should also make this information available to the public through a user-friendly website that is accessible to the public. Ultimately, DEP and the public should be able to know: what facilities are accepting wastewater and from whom, the makeup and concentration of contaminants in the water, the quantity of the wastewater, and the legal agreements are between the drilling company and the wastewater processing facility.

Wastewater Reuse

Some drilling companies have reported that they are using various techniques to reuse Marcellus wastewater from well sites. If these reuse techniques result in a more efficient use of water, a decrease in fresh water withdrawals, and a decrease in pollution flowing into waterways, PennEnvironment supports this. However, it is important that these practices are done in a way that does not put groundwater at risk or cause unexpected environmental harm. In order to ensure wastewater reuse as a viable strategy, DEP should analyze the drilling industry's wastewater reuse practices, determine what regulations, if any, should apply to this practice, and determine if there are regulatory gaps that should be addressed.

Economic costs of implementation

Lastly, I would like to address the issue of cost and construction related to the treatment of drilling wastewater. DEP has estimated that treatment costs with this proposed standard in place could be on the order of \$0.25/gallon.⁸ We feel strongly that Pennsylvania's taxpayers should not bear the brunt of these cost increases and that industry is responsible for financing these projects as part of the cost of doing business. At a time when the Commonwealth is dealing with budget deficits and taxpayers are under incredible economic pressures in the current recession, we believe that it is the industry's responsibility for covering these costs.

In closing, I again want to thank Sen. White for inviting me to today's event. I look forward to working with you all on this important issue.

⁸ Pennsylvania Department of Environmental Protection (PA DEP). November 7, 2009. "Proposed Rulemaking, 25 Pa. Code Ch. 95, Wastewater Treatment Requirements," section F. Benefits, Costs and Compliance.