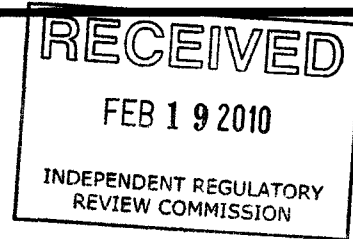


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From: Matthew Royer [MRoyer@cbf.org]
Sent: Friday, February 12, 2010 3:31 PM
To: EP, RegComments
Cc: Hines, John; Aunkst, Dana
Subject: Chapter 95 Comments
Attachments: CBF Chapter 95 Comments Final.doc



Dear Environmental Quality Board:

Attached for your consideration are comments submitted by the Chesapeake Bay Foundation on the proposed revisions to 25 Pa Code Chapter 95.

Thank you for your attention to this matter.

Sincerely,

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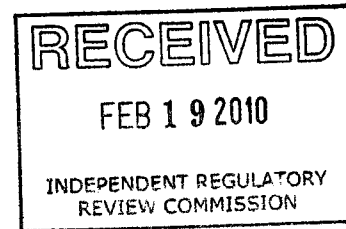
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CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

February 12, 2010

Via email

Environmental Quality Board
P.O. Box 8477
Rachel Carson State Office Building, 16th Floor
400 Market Street
Harrisburg PA 17101-2301
regcomments@state.pa.us



RE: Proposed Chapter 95 Regulations

Dear Environmental Quality Board:

On behalf of the Chesapeake Bay Foundation (CBF), we respectfully submit the following comments on the proposed Chapter 95 regulations.

CBF is the largest nonprofit organization dedicated to the protection and restoration of the Chesapeake Bay, its tributaries, and its resources. With the support of over 240,000 members, our staff of scientists, attorneys, educators, and policy experts work to ensure that policy, regulation, and legislation are protective of the quality of the Chesapeake Bay and its watershed.

1. Wastewater from hydrofracking presents serious water quality challenges for Pennsylvania.

Wastewater from Marcellus Shale development is a highly contaminated waste stream that presents significant threats to water quality of receiving streams. It has been described by one chemist at a prominent Pennsylvania university as very unusual and in need of further study.¹ It is typically several times (and can be up to ten times) saltier than sea water; in some cases approaching saturation. It can be up to one-third dissolved solids. The dominant ion by far is chloride, which is known to be toxic to aquatic life. It can contain high levels of barium and strontium, heavy metals that can be toxic to aquatic life. Sediment bioconcentration factors for strontium are higher than that for water, which results in higher bioavailability and concentration from the

¹ Kirby, Carl, Ph.D, Bucknell University, The Science of Marcellus Shale Summit at Lycoming College, Williamsport, PA (January 29, 2010).

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sediment to aquatic life. Biocides, surfactants, and various organic compounds, including BTEX (benzene, toluene, ethylene, xylene), that are used as additives in the hydrofracking process are present in the wastewater and can impact biological treatment systems of standard municipal wastewater treatment operations if not handled carefully and bled through the system at proper amounts.

Even with increased recycling and reuse of this wastewater by the industry, the high amount of drilling for Marcellus shale contemplated in the Commonwealth of Pennsylvania over the next several years and decades will mean that large volumes of this highly unusual and highly contaminated wastewater will have to be properly disposed.

2. Consideration of the benefits and costs strongly supports the development of a technology-based effluent limits for the oil and gas industry requiring treatment technology to meet the effluent limits for TDS, chlorides, sulfates, barium, and strontium established in the proposed rulemaking.

The Clean Water Act contemplates that, for such waste streams, technology-based limits employing the best available technology economically achievable be established for the industry to achieve specific end-of-pipe effluent limits on parameters of concern set forth in NPDES permits. 33 U.S.C. § 1311. EPA is authorized under the Clean Water Act to establish industry-specific effluent limitation guidelines for setting these technology-based limits. 33 U.S.C. § 1314. However, where EPA has not established guidelines for industrial categories, DEP is authorized to establish technology-based limits for such categories. 25 Pa. Code § 92.2d(2).

By EQB proposing this regulation for public comment and DEP allowing the dialogue of the TDS Stakeholder Group – well represented by industry – to move forward, DEP has, with input from appropriate stakeholders, gathered the information needed to make an informed decision on setting the standard, including information on the treatment technologies available, costs to the regulated industry, and the environmental costs and benefits of establishing the standard.

We believe that this information supports establishment of the end-of-pipe effluent limits proposed by DEP. In sum, the treatment technologies available to treat this volume and type of wastewater are either all or nothing—that is, limit of technology using some method of evaporation/distillation (all) or dilution of the concentration of the waste stream to avoid treatment (nothing). Dilution is not an appropriate treatment technology, particularly with industrial waste streams this contaminated, and merits no serious consideration.² We believe the environmental and health risks of relying upon dilution to address these serious industrial wastewater concerns are too great and place

² See EPA Effluent Limitation Guidelines for Centralized Wastewater Treatment (CWT) Industry Final Rule, 65 Fed. Reg. 247 pp. 81241-81313 (December 22, 2000), Chapter 8 p. 8-3 (“EPA does not consider the use of equalization tanks for dilution as a legitimate use. In this context, EPA defines dilution as the mixing of more concentrated wastes with greater volumes of less concentrated wastes to a level that enables the facility to avoid treatment of the pollutant.”).

our rivers and streams at tremendous risk. This is particularly true now that *Prymnesium parvum* (golden algae) has been found in Pennsylvania surface waters. This saltwater algae produces a toxin deadly to fish, mussels, and salamanders and thrives and outcompetes freshwater algae in high TDS waters. It has been responsible for a massive fish kill on Dunkard Creek in southwestern Pennsylvania. EPA's preliminary report on the Dunkard Creek fish kill concludes that "control of TDS on Dunkard Creek and other watersheds is the best solution to control *P. parvum* blooms."³

On the cost side, the continued dialogue and information gathering of the work group has already produce cost estimates much lower than initial industry projections. Any new regulatory standard will have costs associated with meeting it, and those costs will be reduced over time as the market place works to provide competition and businesses internalize all required costs of environmental compliance.

3. A recycling and reuse requirement should be part of the final rulemaking, but must also include strong environmental protection standards for recycling and reuse of wastewater.

A significant development resulting from this proposed rulemaking is the gas industry's increasing emphasis on recycling and reuse to decrease volumes of wastewater for disposal. Not only will recycling and reuse mean less freshwater withdrawals, less truck traffic, and less wastewater to be disposed, it will mean decreased costs to the industry, as it saves in water withdrawal, transportation, and disposal costs. This is a positive development, and a recycling and reuse requirement should be part of any final rulemaking developed by DEP.

However, we are concerned that DEP's current regulatory regime does not have in place sufficient environmental requirements for handling and processing of flowback for recycling and reuse. Spills of flowback and fracking chemicals on site are among our chief concerns with respect to Marcellus development, and present a serious threat to our surface and groundwater. The requirement for recycling and reuse must be accompanied by strong environmental performance standards for recycling and reuse that are protective of our surface and groundwater. These specific standards are not in place in current regulations and must be developed to ensure protection of waters of the Commonwealth. Furthermore, any impoundments used for wastewater recycling and reuse treatment, blending, and handling must meet the stringent criteria for waste impoundments. We note that freshwater impoundments that may have already been permitted and constructed onsite for storage of freshwater used in the fracking process may be unable to meet these more stringent standards applicable to waste impoundments. DEP should ensure that any structures used in the recycling and reuse process are compliant with waste storage facility requirements.

³ Reynold, Louis. USEPA. Update on Dunkard Creek (Online). November 23, 2009. Available: <http://www.epa.gov/region03/dunkard.pdf>. [February, 12, 2010].

4. Whole Effluent Toxicity (WET) Testing must be a requirement for all permitted discharges of hydrofracking wastewater.

DEP may impose whole effluent toxicity (WET) testing requirements on wastewater discharges where it is determined that the testing is necessary to assure the protection of aquatic life. 25 Pa. Code § 16.52. Given the variable and complex nature of flowback wastewater, the near impossible task of establishing an appropriate set of parameter-specific discharge criteria reasonably expected to protect aquatic life and public health, and the information presented below, we strongly recommend that the final rulemaking require WET testing as a provision of all NPDES permits for treated flowback wastewater.

TDS is an “umbrella” term for a myriad of constituents simply based on particle size. TDS, in and of itself, may not adequately address the potential in-stream water quality impacts to receiving waters in many cases. In particular, the proposed TDS standard does not, in our opinion, sufficiently address the concern of the full degradation/treatment of the multitude of chemicals used in the fracking process, as noted in comment 1 above. Many of these chemicals are hydrophilic and will remain in the waste stream; others are hydrophobic where they may accumulate in solids removed from the flow back water or in sediments of receiving waters. A number, if not most, of these compounds are known or suspected carcinogens, mutagens, and/or endocrine disruptors. Many have the ability to bioaccumulate in aquatic life, including game fisheries. Because of their structure, one would anticipate that many of these compounds will not be easily degraded under many wastewater treatment technologies and/or have degradation by-products (primary, secondary, etc) which may be more toxic than the parent compound. Even at low concentrations, the myriad of compounds may act synergistically to result in aquatic life impacts. Therefore, we contend that regardless of whether the proposed TDS standard is met, treated discharges have an unacceptable potential to be both acutely and/or chronically toxic to aquatic life.

To that end, we recommend that DEP require as part of the WET requirements for this industry, at a minimum:

- a. At least three months before the effective date of the permit, the permittee should submit to the DEP for approval a study plan to evaluate wastewater toxicity at the outfall by using biomonitoring. The study plan should include a discussion of:
 - wastewater and production variability
 - sampling & sample handling
 - source & age of test organisms
 - source of dilution water
 - testing procedures/experimental design
 - data analysis
 - quality control/quality assurance
 - report preparation
 - testing schedule

- b. The testing program should consist of definitive quarterly testing for one year. Three of the quarters should have acute testing and one of the quarters should have chronic testing. This testing should be initiated no later than three months following DEP's acceptance of the study plan.
- c. The samples used for biomonitoring should be collected at the same time and location as the samples analyzed for the effluent limitations and monitoring requirements. For chlorinated effluents, samples should be collected after dechlorination.
- d. If plant processes or operations change so that there is a significant change in the nature of the wastewater, the DEP should require the permittee to conduct a new set of tests.
- e. When effluent toxicity (acute or chronic) is confirmed, the discharger should be required to perform a Toxicity Reduction Evaluation (TRE). A TRE is an investigation conducted to identify the cause(s) of effluent toxicity or isolate the source(s) and determine the effectiveness of control options, implement the necessary control measures, and confirm the reduction in toxicity.

Guidance documents covering WET and TRE aspects are continually advanced by EPA and its contractors. Methods and guidance for WET testing can be found at: <http://www.epa.gov/waterscience/methods/wet/> and for TRE studies in EPA's *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (http://www.epa.gov/npdes/pubs/wet_industrial_tre_manual.pdf) and the subsequent clarifications document (<http://www.epa.gov/npdes/pubs/owmfinaltretiie.pdf>).

5. "Watershed-based" alternatives to the proposed standards are ill conceived, a misallocation of limited DEP staff and resources, and contrary to the legal and regulatory regime for regulating point sources of pollution under the Clean Water Act and Clean Streams Law.

Some members of the TDS Stakeholders Group have recommended a complex and labor intensive watershed-based approach in lieu of end-of-pipe discharge limits. We reject this proposal and urge DEP and the EQB to do the same. This nonregulatory "watch and wait" approach fails to take appropriate steps to prevent the lowering of water quality in our rivers and streams as a result of industrial pollution, and in this respect is counter to the goals and requirements of the Clean Water Act and the Clean Streams Law. DEP has a duty to limit pollution from industrial sources. Given the complex and potentially toxic nature of the treated discharge, it is inappropriate to manage water resources in a way that allows for water quality to degrade to just before the point of impairment. The need for effluent limits on point sources is immediate when considering that the prevention of high TDS environments in our rivers and streams is critical to stemming the spread of toxic *P. parvum*. We hope DEP agrees with us on this

basic premise and rejects this proposal. Moreover, the proposal is complicated and would take a great deal of DEP staff and resources to administer, creating an entirely new bureaucratic program whose essential role would be to monitor surface waters and not do anything until water quality started to look poor. During these challenging fiscal times when DEP has been faced with severe budget cuts, this inefficient and ineffective method of pollution control is particularly inappropriate.

6. DEP should continue to evaluate the need and method for addressing high TDS discharges from other industries, while proactively addressing specific high TDS watersheds by developing water quality based effluent limits on new and existing discharges causing or contributing to violations of water quality standards.

In proposing a discharge standard for all sources of high TDS wastewater, DEP has captured many industries (including publicly owned treatment works) for which the cost of meeting these limits may be particularly burdensome. Yet we believe these standards are absolutely necessary to deal with the new industrial waste source that is being produced in Pennsylvania from hydrofracking operations in the Marcellus shale. The need for addressing this industrial waste source will only be greater as drilling increases over the next several years. One approach DEP should consider is setting technology based limits for the oil and gas industry now, and continuing to evaluate the need for such technology based standards for other industries in the future.

We recognize that TDS limits may presently be necessary to address water quality problems in the Monongahela River and other watersheds which are high in TDS. For these stressed watersheds, DEP should proactively develop water quality based effluent limits (WQBELs) for existing and new discharges in those watersheds to ensure that all NPDES permits for all point sources do not cause or contribute to excursions of water quality standards as required by federal and state law. 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d)(1)(i) (incorporated by reference to 25 Pa. Code § 92.2(b)(14)); 40 C.F.R. § 122.4(d) (incorporated by reference in 25 Pa. Code § 92.2(b)(2)); 25 Pa. Code § 92.73(5); 25 Pa. Code § 92.31(a)(1); 25 Pa. Code § 92.31(a)(5).

7. Simultaneous with the finalization of these regulations, DEP should evaluate the need for a permanent prohibition against surface water discharges of flowback wastewater.

Finalization of these standards is absolutely necessary to deal with the immediate need to protect water quality of our rivers and streams from discharges of treated flowback wastewater. However, given the amount of wastewater expected to be generated over the next several decades of Marcellus shale development in Pennsylvania, we are concerned that surface water discharges of flowback wastewater may not be an adequate long term solution. While permit limits set under these proposed standards would be stringent (and would be even more protective with required WET testing and reuse and recycling requirements and accompanying environmental protection

standards), any violation of permit limits could potentially discharge highly contaminated and toxic wastewater into waters of the Commonwealth, where aquatic life, including economically valuable game species, and downstream drinking water intakes could be contaminated.

We believe EQB should finalize these regulations with the recommended modifications listed below. However, simultaneously, as other states with natural gas industries have done, DEP should immediately begin analyzing the need for a permanent prohibition of surface water discharges of flowback wastewater and the development of adequate and protective nondischarge disposal alternatives, such as onsite deep well injection. Such an injection program would need to be robust and protective of surface and groundwater. Given the lack of primacy for the deep well injection program, DEP should seek to engage EPA in this analysis, and should engage all relevant stakeholders as it undertakes this analysis.

Strong recycling and reuse standards coupled with onsite or local deep well injection disposal requirements may ultimately be the best long term solution to some of the difficult water and other environmental issues with which Pennsylvania is currently grappling. If, after thorough investigation involving stakeholder input, DEP believes that prohibiting surface water discharges and requiring onsite or local injection is the most appropriate long term option, DEP should propose additional regulations to implement these requirements.

Recommendation

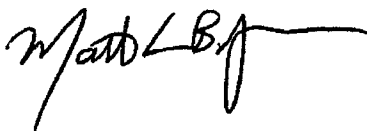
Our recommendation with respect to the proposed regulations is as follows:

- Require recycling and reuse of hydrofracking wastewater for all oil and gas operations.
- Establish strong environmental standards for recycling and reuse to ensure protection of surface and groundwater.
- For all discharges of wastewater associated with oil and gas activities, require technology sufficient to meet the end-of-pipe limits set forth in the proposed Chapter 95 rulemaking.
- Require whole effluent toxicity (WET) testing for all discharges of wastewater associated with oil and gas activities, and require additional permit limits if necessary to prevent toxic impacts to aquatic life on a case-by-case basis once WET testing results are analyzed.
- Continue evaluating the need for limits on other industries that produce high TDS wastestreams.

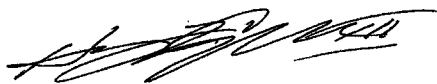
- Evaluate the long term need for prohibiting surface water discharges of flowback wastewater and requiring onsite or local deep well injection and, if deemed appropriate, enact additional regulations to implement these requirements.

Thank you for the opportunity to submit these comments.

Respectfully Submitted,



Matthew Royer
Staff Attorney



Harry Campbell
Senior Scientist

cc: John Hines
Dana Aunkst