



March 29, 2018

Vincent Sapienza, P.E.
Commissioner

Pamela Bush, Commission Secretary
Delaware River Basin Commission
PO Box 7360
West Trenton, NJ 08628

Paul V. Rush, P.E.
Deputy Commissioner
Bureau of Water Supply
prush@dep.nyc.gov

Re: Delaware River Basin Commission's (DRBC) Draft Natural Gas
Development Activities Regulations

Dear Ms. Bush:

Thank you for the opportunity to review DRBC's draft regulations on Natural Gas Development Activities. As you are aware, the City has previously commented on DRBC's proposed regulation of natural gas extraction and appreciates DRBC's consideration of these comments. Based upon our careful review of the proposed regulations, we offer additional comments focused on ensuring that these regulations protect the vital resources of the Delaware River Basin, an irreplaceable source of water and recreation for 15 million people.

The City has a particular interest in these regulations as the Delaware River is a significant source of the City's water supply. Over the past 25 years, the City has invested more than \$2.7 billion in watershed protection programs to protect its supply. Those investments, a large portion of which have been and continue to be made in the Delaware River watershed also support sustainable farming, environmentally sensitive economic development, and local economic opportunity. These investments further protect water quality for the 15 million people who rely on the Delaware River watershed for clean drinking water.

The Delaware River is a shared resource and changes in its watershed's environment affect us all. As you know, the City's own study on the impacts of High-Volume Hydraulic Fracturing (HVHF) determined that, based on the best available science and the current state of technology, HVHF cannot safely be conducted in the New York City watershed. Subsequently, New York State also concluded that HVHF should be prohibited because "... there are no feasible or prudent alternatives that would adequately avoid or minimize adverse environmental impacts and that address the scientific uncertainties and risks to public health from this activity."(Findings Statement for the Final SGEIS, June 2015).

DRBC's draft regulations, however, would allow for water withdrawals for well development occurring outside of the Delaware Basin. While these proposed regulations are stricter than earlier draft regulations, the City remains concerned about the lack of a cumulative impact assessment to evaluate the impact of a new consumptive use. We recognize and appreciate that the draft regulations state that use of Delaware Basin water for HVHF outside the basin is "discouraged," Section 440.4, but, as explained below, urge DRBC to establish circumstances in which such export of water will be prohibited.

The City is also troubled that the draft regulations would allow for treatment and disposal within the Basin of industrial wastewater generated from natural gas production outside of the Basin. Given the high chloride levels that wastewaters resulting from HVHF typically have, this could increase salinity levels in the lower Delaware and place additional burden on New York City reservoirs for releases during a drought emergency.

Cumulative Impact Assessment

A cumulative impact assessment is essential to developing a full understanding of the impacts of water withdrawals and wastewater treatment for the Delaware Basin as a whole. Such an assessment must include a depletive use budget for the basin as recommended in Section V, Recommendation 13, of the 1982 Good Faith Recommendations.¹ Depletive water use has a direct bearing on the Basin's future development, its water quality, water quantity, ecological health, salinity intrusion, and drought management. This information is also critical for managing the effects of climate change since changes in sea level and precipitation patterns may put added pressure on the water resources. A cumulative impact assessment must be performed before adopting regulations; once the regulations are in place, they will require analysis of alternatives and impacts only of the activity proposed in individual project approvals. As such, the entirety of the potential impacts of permitting water withdrawals and wastewater treatment associated with HVHF will escape review and consideration of alternatives.

As you are aware, the City is required, as a condition of its diversion of water from the Delaware Basin for drinking water purposes, to make releases from its Delaware system reservoirs under certain conditions. An analysis of the cumulative impacts of consumptive uses in the basin – including the water withdrawals and wastewater disposal that would be allowed by the draft regulations – is necessary to determine appropriate limitations on such withdrawals.

In order to address potential adverse impacts associated with aggregated consumptive withdrawals, DRBC should use a cumulative impact analysis to establish standard permit terms

¹ Interstate Water Management Recommendations Among the Parties to the U.S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 78-20, available at <http://www.state.nj.us/drbc/library/documents/regs/GoodFaithRec.pdf>.

which would specify under what river flow conditions withdrawals or wastewater discharges would be temporarily halted. For example, DRBC should mandate, as a condition of approval, that gas drilling companies take water only during times when the City is not required to make releases as directed by the Delaware River Master to meet the Montague flow objective. Consumptive withdrawals with low bypass requirements will adversely affect downstream conditions, especially during periods of low flow, requiring increased compensating releases by the City to meet the Montague flow objective. Similarly, requiring withdrawals to cease in connection with the Trenton flow objective would prevent natural gas withdrawals from adversely impacting existing uses in the lower Delaware Basin.

A cumulative impact analysis should also be undertaken to evaluate conditions in which wastewater discharges should be limited. In particular, wastewater treatment plants discharging high salinity wastewaters from natural gas development should be reduced or ceased entirely when the salt front nears the Philadelphia drinking water intake at Torresdale but the action levels should be informed by a cumulative impact analysis. A comprehensive basin-wide analysis would provide the data necessary to set appropriate restrictions on natural gas withdrawals and adequately protective pass-by flows.

Wastewater Treatment and Disposal

Treating and disposing of industrial wastewater generated and imported from outside of the Basin puts water quality in the Basin at risk and also sets a troubling precedent for the future. Once a water source or its watershed is contaminated, it is difficult, if not impossible, to restore it to its pre-contamination condition. DRBC has clearly tried to construct highly protective regulations by requiring, for each application for Commission approval:

1. Review and approval by individual docket;
2. Additional effluent limitations (the most stringent among DRBC, state, and Federal regulations);
3. Treatability study; and
4. An analysis of alternatives and impacts.

However, even with these conditions, these permits are unlikely to be adequately protective. Produced water from natural gas wells is highly variable, and may contain many different chemicals, which can vary considerably based on changing production methods within the applicant's control, as well as on subsurface constituents that are outside the applicant's control and even knowledge.

While the draft regulations include specific requirements relating to total dissolved solids, they do not directly address or seek to impose conditions to address radioactivity. Natural radioactivity in the Marcellus Shale wastewater is relatively high and the concentrations vary

widely between wells and even over time from a single well. This makes characterization of the waste stream difficult.^{2,3} Waiting for individual applications and docket reviews to analyze the waste stream will not provide adequate opportunity for consideration of appropriate treatment requirements.

Radioactive chemicals are not removed using conventional wastewater treatment and can therefore pose a risk to surface water, groundwater and plant workers.^{4,5} If the radium gets into the groundwater, it decays into radon gas which can migrate and accumulate in closed spaces. Nearly the entire Basin is in EPA's Radon Zone 1, containing the highest predicted radon concentrations,⁶ so importing wastewater with high levels of radium seems unnecessarily risky and may exacerbate the existing condition. If DRBC proceeds with allowing treatment of this wastewater within the Basin then additional safeguards consisting, at a minimum, of specific and frequent monitoring for radioactivity levels in the wastewater, sludge and groundwater should be added.

We appreciate the opportunity to comment on these regulations and that the Commission has sought to balance a wide range of stakeholder needs while protecting the Delaware River. We nonetheless urge further consideration of cumulative impacts and potential risks associated with treatment and disposal of produced water from HVHF before DRBC finalizes its regulations.

If you have any questions or comments, or if we can be of any further assistance in this matter, please feel free to contact me directly at (845) 340-7800, or prush@dep.nyc.gov.

Sincerely,



Paul V. Rush, P.E.
Deputy Commissioner

² Kargbo, David M., R.G. Wilhelm, D.J. Campbell, Natural Gas Plays in the Marcellus Shale: Challenges and Potential Opportunities, Environ. Sci. Technol. 2010, 44, 5679–5684.

³ Horn, E. G., Letter to Bradley Field, Director; Division of Mineral Resources; New York State Department of Environmental Conservation. Marcellus Shale Potential Public Health Concerns, State of New York Department of Health, July 21, 2009. http://treichlerlawoffice.com/radiation/nysdoh_marcellus_concerns_090721.pdf

⁴ New York State Department of Environmental Conservation, Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program – Regulatory Program for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs, May 2015, <http://www.dec.ny.gov/energy/75370.html>

⁵ Nicoll, Gayle, Radiation Sources in Natural Gas Well Activities, Occupational Health & Safety Online, October 2012, <https://ohsonline.com/Articles/2012/10/01/Radiation-Sources-in-Natural-Gas-Well-Activities>

⁶ See <https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information>