

March 30, 2018

To: Commission Secretary, Delaware River Basin Commission

From: Don Hamilton, Wayne County, PA resident

Subject: DRBC Natural Gas Development Regulations

I recognize and appreciate the significant efforts of the Delaware River Basin Commission (DRBC) to address the development of natural gas resources within the Basin using an approach that is protective of water quality and natural resources while also recognizing the demand for energy. I support the DRBC's authority under the Delaware River Basin Compact (1961) to manage the water resources of the Delaware River Basin without regard to political boundaries, and to facilitate a consistent approach to land use practices that are protective of natural resources and water quality.

The DRBC is the one agency responsible for assessing the overall cumulative impacts of land use on the valuable water resources of the Basin, for taking a holistic view of the overall health of the Delaware River system, and for ensuring that it meets the water supply needs of stakeholders into the future.

Economic Considerations Beyond Natural Gas Development

The Delaware Basin's water supplies, natural resources, and ecosystems (natural capital) provide ecosystem goods and services estimated to be worth \$21 billion per year (Kauffman 2011). As the primary steward of the Basin's water resources, the comprehensive watershed management provided by the DRBC is vital for maintaining the Basin's high quality Special Protection Waters that are subject to the Commission's antidegradation regulations, ensuring that they meet the water supply needs they're relied upon for into the future.

Water quality and flow-dependent resources and values are also important drivers for the local and regional economy. Shepstone Management Company, Inc. (2014) concluded that the economic impact of fishing and boating from Callicoon, NY to Deposit, NY generated a net present value of \$414 million to the local economy of the Upper Delaware Region. Additionally, every dollar spent in the Upper Delaware at a fishing destination was accompanied by another \$0.61 spent en route, leading to expenditures of \$186 million in surrounding communities (Shepstone 2014). On a broader scale, the Delaware River Basin also contributes \$25 billion dollars annually to the region's economy through jobs in maritime, agricultural, tourism, hunting, fishing, and wildlife industries, and directly or indirectly is responsible for 600,000 jobs representing \$10 billion dollars in annual wages (Kaufmann 2011).

General Considerations

Water Quantity - Exportation

The exportation of additional water from the Delaware River Basin may have negative system-wide impacts cumulatively, as well as potential localized acute impacts due to existing demands for water outside the basin and the absence of a minimum flow requirement for the upper Delaware River. The Delaware River Basin already has extraordinary demands upon the water resources of the system, with out-of-basin transfers that, at times, approximate half the flow volume of the river. The 13,539 square mile watershed drains only 0.4% of the total continental U.S. land area, yet it provides drinking water to approximately 5% of the nation's population (over 15 million people). Diversions directed by the *1954 Amended Supreme Court Decree* include up to 800 million gallons per day (mgd) to New York City and 100 mgd to New Jersey. In addition to this 900 mgd diversion, there are 6,372 mgd withdrawn from surface and groundwater sources in the basin (DRBC 2018). Approximately 64% of these withdrawals are for power generation, much of that in consumptive use (DRBC 2018). Under these demands, sections of the river are already dewatered periodically.

Currently there are no minimum flow requirements to meet ecological and recreational flow needs for the upper Delaware River, in a system where water is closely managed and allocated to meet the needs of numerous stakeholders. The upstream-most minimum flow target on the Delaware River is at the USGS Montague Gage (at River Mile 246), while the main stem of the river extends another 84 miles above that point. Directed releases from the New York City reservoirs on the East and West Branches of the Delaware River significantly supplement main stem flows. But these directed releases are often cut back when hydropower discharges are occurring into the Lackawaxen River tributary (at River Mile 277) and the Mongaup River (at River Mile 261). This often leaves much of the upper river above those hydropower-discharge tributaries (between 53 and 69 upstream miles) with minimal flows. In addition, many shallow riffles throughout the upper Delaware River are prone to periodic, severe dewatering, impacting aquatic life as well as impairing water-based recreational activities such as fishing and boating.

The concerns above may be exacerbated by the fact that many of us anticipate that greater water demand for potential export will occur in the northwestern portions of the Delaware River Basin to support unconventional gas development in the Susquehanna River Basin. Such surface water and/or groundwater withdrawals for export to support well drilling, subsequent well stimulation (including hydraulic fracturing) and re-fracturing of shale gas resources would have the greatest impacts on headwater streams, particularly during times of reduced flow. Reduced flow in headwater streams/tributaries to the main stem Delaware River may impact water quality and quantity sufficiently to reduce their ability to support ecosystem needs, the full range of water-based recreational opportunities, and the recreation-based economy of the area. Anticipated export water demand from the northwestern portion of the basin is premised on: (1) lower costs associated with

shorter haul distances with proximity to Marcellus shale gas development in nearby counties (e.g. Susquehanna, Bradford and Lackawanna Counties); and (2) ready access to multiple Delaware River tributaries and other basin water sources (ponds, lakes, wetlands and reservoirs) located on properties near the basin boundary. The concentration of water withdrawals in a small portion of basin for export may compound/exacerbate local effects on water supply, ecosystem and water-based recreational needs, and economic opportunities that may be difficult to accurately recognize, assess or fully quantify.

Water Quality

The entire 197-mile non-tidal Delaware River is designated Special Protection Waters and subject to non-degradation water quality standards. These standards represent protections that provide for no measurable change from existing water quality except toward natural conditions. Water withdrawals and reductions in water quantity can degrade water quality by altering thermal regimes and reducing dissolved oxygen, while also reducing the dilution capacity of a stream, potentially leading to higher nutrient and contaminant concentrations. It is important that the DRBC consider the water quality impacts before allowing additional exportation of water from the Delaware Basin and ensure that any water withdrawals will maintain the quality of water in the basin.

Any proposed water withdrawal sites may also require that the applicant develop a site specific Non-Point Source Pollution Control Plan (NPSPCP) for the location, as outlined in Water Code Article 3.10.3.A.2.e.1, including which Best Management Practices the applicant intends to use to control non-point source loads from the project (DRBC 2013a). In addition to mitigating any direct sources of pollution from the project, any decreases in water quality as a result of reduced flow volumes should also be considered by the DRBC, included in the site plan, and be mitigated by the applicant.

Aquatic Life

As described above, water withdrawals are likely to be proposed from smaller tributary and headwater streams closer to the Basin boundary and these sites would need to uphold water uses that include the maintenance of aquatic life, according to DRBC Water Code Article 3.10.2.B.2 (DRBC 2013a). Evaluation would require prescribed pass-by flows sufficient to maintain habitat, temperature, and dissolved oxygen objectives that support the aquatic life communities in these stream reaches and below. Reductions in water quantity can also have direct impacts on aquatic life that include stranding, displacement, and disruption of spawning, migration, and emergence cues. These pass-by flow requirements for the maintenance of aquatic life may not be compatible with 7Q10 minimum pass-by flow requirements designed to meet point discharge water quality standards.

High volume or high velocity water withdrawals also have the potential for entrainment of aquatic species. Due to the high biodiversity and the presence of special status species within the basin, it is critical that any withdrawal from the basin be done in a way to minimize or avoid entrainment and damage to aquatic species. Consideration should also be given for how best to prevent the transfer and spread of any non-native, invasive aquatic species during any water transfer operations.

Specific Comments on Draft DRBC Natural Gas Regulations

I support the DRBC's intention to carefully evaluate, through the docket process, any new, potentially significant transfer of surface water, groundwater, treated wastewater or mine drainage water outside of the Basin. I also support the long-standing DRBC policy to discourage the exportation of water from the Delaware River Basin and the importation of wastewater into the Basin as described in Section §2.30 of the Water Code (DRBC 2013a). As stated at Sections 440.4 and 440.5 of the draft natural gas regulations, this policy will also apply to exportation of water for hydraulic fracturing and importation of produced water associated with hydraulic fracturing activities outside the basin.

I support proposed changes to existing regulations that will strengthen these protections. Proposed changes include the classification of projects that require review under Section 3.8 of the Delaware River Basin Compact to include those at "*any volume or rate*" and the requirement that importation projects must analyze alternatives involving no importation and evaluate the water resource, economic and social impacts of the project, as described in section §2.30.4 (B and C) of the Commission's Water Code. I recommend that the evaluation of projects proposing to import wastewater also include evaluation of "*any other significant benefit or impairment which might be incurred to the Delaware River Basin as a result of the proposed transfer*" as described in section §2.30.4(H) of the Water Code (DRBC 2013a). Additionally, it is unclear whether language in section §2.30.4 (F and G) of the Water Code, requiring applicants to describe the "relationship" of proposed projects to all other diversions and other DRBC actions, is intended to capture the cumulative impacts of proposed projects (DRBC 2013a). I recommend that this language be clarified to more clearly require cumulative impact analysis, as defined in the DRBC Administrative Manual – Part III Water Quality Regulations (DRBC 2013b), and that this analysis be required for both the export of water and importation of wastewater associated with hydraulic fracturing.

I appreciate the opportunity to review and provide comment on the DRBC draft natural gas regulations.

Sincerely,

Don Hamilton

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References

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