

bearing from the airport and within a 6.6-mile radius of Mid-State Airport extending clockwise from the 098° bearing to the 183° bearing from the airport, and within a 8.3-mile radius of Mid-State Airport extending clockwise from the 183° bearing to the 261° bearing from the airport and within 3.1 miles each of the Philipsburg VORTAC 067° radial extending from the VORTAC to 10 miles northeast of the VORTAC, and within 3.5 miles each side of the 327° bearing from a point at lat. 40°53'09" N, long. 78°05'06" W, extending from said point to a point 7.4 miles northwest, and within 2.2 miles each side of the Philipsburg VORTAC 330° radial extending from the VORTAC to 5.3 miles northwest of the VORTAC and within 3.1 miles each side of the Philipsburg VORTAC 301° radial extending from the VORTAC to 10 miles northwest of the VORTAC.

Issued in College Park, Georgia, on January 4, 2018.

**Ryan W. Almasy,**

*Manager, Operations Support Group, Eastern Service Center, Air Traffic Organization.*

[FR Doc. 2018-00395 Filed 1-11-18; 8:45 am]

**BILLING CODE 4910-13-P**

## DELAWARE RIVER BASIN COMMISSION

### 18 CFR Parts 401 and 440

#### Administrative Manual and Special Regulations Regarding Natural Gas Development Activities; Additional Clarifying Amendments

**AGENCY:** Delaware River Basin Commission.

**ACTION:** Proposed rule; notice of public hearing.

**SUMMARY:** The Commission proposes to amend its *Special Regulations* by the addition of a section on hydraulic fracturing in shale and other rock formations, including: The prohibition of high volume hydraulic fracturing in such formations; provisions related to water use for hydraulic fracturing; and provisions related to the management of produced water from hydraulic fracturing. The Commission also proposes to amend its *Administrative Manual—Rules of Practice and Procedure* by the addition of project review classifications and fees related to the management of produced water from hydraulic fracturing of hydrocarbon bearing rock formations. Minor amendments to the project review classifications unrelated to hydraulic fracturing are also proposed.

**DATES:** *Written comments:* Written comments will be accepted through 5 p.m. on March 30, 2018.

*Public hearings:*

1. January 23, 2018, 1:00 p.m. to 4:30 p.m., Waymart, Wayne County, PA

2. January 23, 2018, 6:00 p.m. to as late as 9:30 p.m., Waymart, Wayne County, PA

3. January 25, 2018, 1:00 p.m. to 4:30 p.m., Philadelphia, PA

4. January 25, 2018, 6:00 p.m. to as late as 9:30 p.m., Philadelphia, PA

5. February 22, 2018, 3 p.m. to as late as 7 p.m., Schnecksville, PA

6. March 6, 2018, 1:30 p.m. to 3:30 p.m., via telephone.

*Registration to attend hearings:*

Online registration to attend hearings will remain open until 5 p.m. the day prior to the hearing. (On-site registration will also be available at in-person venues.) Registrants will be afforded opportunities to request speaking time.

**ADDRESSES:** *Written submissions:*

Written comments will be accepted through the Commission's online public comment collection system at: <http://dockets.drbc.commentinput.com>. To request an exception to use of the online system based on lack of access to the internet, please contact: Commission Secretary, DRBC, P.O. Box 7360, West Trenton, NJ 08628.

*The hearing locations are:*

- Ladore Camp, Retreat and Conference Center, 287 Owego Turnpike, Waymart, PA 18472 (Jan. 23)
- DoubleTree by Hilton Hotel Philadelphia Airport, 4509 Island Avenue, Philadelphia, PA 19153 (Jan. 25)
- LCCC Community Services Center, 4525 Education Park Drive, Schnecksville, PA 18078 (Feb. 22)
- By telephone 866-831-8713 (Mar. 6)

*Registration to attend hearings:* To register to attend one or more public hearings, use the links posted on the Commission's website at [http://www.nj.gov/drbc/meetings/proposed/notice\\_hydraulic-fracturing.html](http://www.nj.gov/drbc/meetings/proposed/notice_hydraulic-fracturing.html) (strongly recommended). On-site registration will also be available at in-person hearing venues. Registrants will be afforded opportunities to request speaking time.

See **SUPPLEMENTARY INFORMATION** for important details regarding the substance of requested comments, registration to attend public hearings, and other aspects of the public process.

**FOR FURTHER INFORMATION CONTACT:** Kate Schmidt, 609-477-7205, [kate.schmidt@drbc.nj.gov](mailto:kate.schmidt@drbc.nj.gov).

**SUPPLEMENTARY INFORMATION:** The Delaware River Basin Commission (DRBC or "Commission") is a regional interstate and federal agency formed by concurrent compact legislation of the four basin states and the federal government in 1961 to manage the water resources of the Delaware River Basin

without regard to political boundaries. Its members are, *ex officio*, the governors of the basin states (Delaware, New Jersey, New York, and Pennsylvania) and the commander of the U.S. Army Corps of Engineers North Atlantic Division, who represents the federal government. Most actions of the Commission, including the adoption of rules to effectuate, apply and enforce the compact, require a majority vote of the Commission's five members.

### Background

On September 13, 2017, the Commissioners by a Resolution for the Minutes directed the Executive Director to prepare and publish for public comment a revised set of draft regulations, to include: "(a) prohibitions relating to the production of natural gas utilizing horizontal drilling and hydraulic fracturing within the basin; (b) provisions for ensuring the safe and protective storage, treatment, disposal and/or discharge of wastewater within the basin associated with horizontal drilling and hydraulic fracturing for the production of natural gas where permitted; and (c) regulation of the inter-basin transfer of water and wastewater for purposes of natural gas development where permitted."

In accordance with the Commissioners' September 13 directive, the Commission is proposing amendments to its regulations and comprehensive plan to better provide for the planning, conservation, utilization, development, management and control of the basin's water resources in connection with the hydraulic fracturing of shale and other hydrocarbon bearing formations to produce oil and gas. The Commission proposes to prohibit high volume hydraulic fracturing within the basin to effectuate the comprehensive plan for the immediate and long-term development and use of the water resources of the basin, and to conserve, preserve and protect the quality and quantity of the basin's water resources for uses in accordance with the comprehensive plan.

Through a series of policies and regulations establishing and amending its comprehensive plan, the Commission over the past half-century has established in-stream water quality standards throughout the basin, prohibited degradation of groundwater, and provided special protection to the non-tidal segment of the Delaware River to preserve its exceptionally high water quality and water supply values. As the agency through which the five signatory parties to the Compact collectively manage the basin's water resources on a

regional basis, the Commission has taken these steps to meet public and private needs for, among other things, drinking water, recreation, power generation, and industrial activity, and to accommodate large out-of-basin diversions by the City of New York and the State of New Jersey that are authorized by the 1954 decree of the U.S. Supreme Court in the matter of *New Jersey v. New York*.<sup>1</sup>

Portions of Pennsylvania and New York comprising about 40 percent of the basin's geographic area are underlain by the Marcellus and Utica shales, geologic strata known to contain natural gas. Although the presence of commercially viable natural gas from these formations within the basin is not known, in regions of Pennsylvania west of the basin divide, oil and natural gas are extracted from the Marcellus and Utica formations by means of directional drilling and hydraulic fracturing using large volumes of water in a process referred to commonly in the region as "high volume hydraulic fracturing" (HVHF).<sup>2</sup> The South Newark Basin formation, which underlies portions of Pennsylvania and New Jersey, may also contain oil and gas deposits capable of development by HVHF. All of the basin areas underlain by the Marcellus and Utica shales, with the exception of a small area of Schuylkill County, Pennsylvania, drain to waters the Commission has designated as "Special Protection Waters", due to their exceptionally high scenic, recreational, ecological, and/or water supply values. The Commission's water quality management policy objective for Special Protection Waters is "that there be no measurable change [in the quality of these waters] except toward natural conditions."<sup>3</sup>

During hydraulic fracturing, hydraulic fracturing fluid consisting primarily of water and recycled wastewater mixed with chemicals is injected through a well bore into the target rock formation under pressures great enough to fracture the rock. The fracturing fluid typically includes proppants (usually sand), which hold open the newly created fractures, allowing the gas to flow back

through them and up the well to the surface. After a well is "stimulated" through hydraulic fracturing, much of the injected fracturing fluid, together with brines that were trapped within the target formation, is conveyed to the surface, where these fluids are collected and managed. The returned fluids, known as "flowback" and "produced water," contain chemicals used in the fracturing mixture, as well as salts, metals, radionuclides, and hydrocarbons from the target rock formation. As discussed in greater detail below, in the Marcellus region in Pennsylvania, the median quantity of water required to stimulate a natural gas well exceeds 4 million gallons for each fracturing event.<sup>4</sup> A single well may be fractured in multiple stages and/or multiple times,<sup>5</sup> and as many as twelve wells may be installed on a single well pad.<sup>6</sup> The volume of water and wastewater involved is thus significant.

The use of HVHF to extract oil and natural gas from tight shale formations presents risks, vulnerabilities and impacts to the quality and quantity of surface and ground water resources that have been documented extensively, including in comprehensive reports by the New York State Department of Environmental Conservation (NYSDEC)<sup>7</sup> and the United States Environmental Protection Agency (EPA),<sup>8</sup> among others. These reports identify the risks to water resources

associated with each of the steps in the "hydraulic fracturing water cycle,"<sup>9</sup> as summarized below. At times, these steps or portions thereof may be identified by the Commission as separate projects. In addition, an EPA technical background document describes industry processes, pollutants generated, risks, and available treatment technologies for produced water from oil and gas extraction.<sup>10</sup> A significant number of data points in this document are provided for the Marcellus formation.

*Water acquisition.* The acquisition of water for use in HVHF may result in modifications to groundwater levels, surface water levels, and stream flows. The Susquehanna River Basin Commission (SRBC) has reported that for the period 2008 through 2013 an average of 4.3 million gallons of water were injected per fracturing event in natural gas wells within the Susquehanna Basin.<sup>11</sup> During the same period, 84 percent of injected water was "fresh" water from surface water and groundwater sources, and the remaining 16 percent was recycled produced water or flowback water.<sup>12</sup> According to EPA, the median volume of water used per well fracturing event in Pennsylvania between January 2011 and February 2013 was 4.18 million gallons.<sup>13</sup> EPA further reports that in at least 10 percent of cases, the water use in Pennsylvania during the same period was over 6.6 million gallons per well.<sup>14</sup> EPA has reported that in the Marcellus formation in Pennsylvania, 82 to 90 percent of the base fluid used for hydraulic fracturing is fresh water that is naturally occurring and that the remaining base fluids (10 to 18 percent) are reused and recycled produced water.<sup>15</sup> Advances in horizontal drilling technology are leading to longer drill paths and the need for more fracturing fluid volumes for each path. According to SRBC, when

<sup>4</sup> James L. Richenderfer *et al.*, *Water Use Associated with Natural Gas Development: An Assessment of Activities Managed by the Susquehanna River Basin Commission—July 2008–December 2013*, Pub. No. 299, April 2016 (hereinafter, "SRBC NG Water Use 2016"), p.39. Available at: [http://www.srbcc.net/pubinfo/techdocs/NaturalGasReport/docs/SRBC\\_Full\\_Gas\\_Report\\_fs306397v1\\_20160408.pdf](http://www.srbcc.net/pubinfo/techdocs/NaturalGasReport/docs/SRBC_Full_Gas_Report_fs306397v1_20160408.pdf).

<sup>5</sup> United States Environmental Protection Agency, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States*, Dec. 2016 (EPA-600-R-16-236Fa) (hereinafter, "EPA HF Study 2016"). Exec. Sum., p. 23, n.3 (explaining that in a multi-stage hydraulic fracturing operation, specific parts of the well are isolated and hydraulically fractured until the total desired length of the well has been hydraulically fractured.) Available at: <https://www.epa.gov/hfstudy>. Also see, 18 CFR 806.3 (SRBC regulations for review and approval of projects, defining "hydrocarbon development project" as including "all other activities and facilities associated with . . . the production, maintenance, operation, closure, plugging and restoration of [unconventional natural gas development] wells or drilling pad sites that require water for purposes including but not limited to, re-stimulation and/or re-completion of such wells . . ." (emphasis added)).

<sup>6</sup> See e.g., Alex K. Manda *et al.*, *Evolution of multi-well pad development and influence of well pads on environmental violations and wastewater volumes in the Marcellus shale (USA)*, J. Environ. Manage., Sep. 1, 2014, 142:36–45. Available at <https://www.ncbi.nlm.nih.gov/pubmed/24814546>.

<sup>7</sup> See NYS Final SGEIS 2016, *supra* n.1.

<sup>8</sup> See EPA HF Study 2016, *supra* n.5.

<sup>9</sup> The term "hydraulic fracturing water cycle" is used by the EPA to describe the five stages of this water-intensive activity: water acquisition, chemical mixing, well injection, produced water handling, wastewater disposal and reuse. EPA HF Study 2016, Exec. Sum., pp. 7–9. Extracted at: <https://www.epa.gov/hfstudy/hydraulic-fracturing-water-cycle>.

<sup>10</sup> See United States Environmental Protection Agency, *Technical Development Document for the Effluent Limitations Guidelines and Standards for the Oil and Gas Extraction Point Source Category*, June 2016 (EPA-820-R-16-003) (hereinafter "EPA TDD 2016"). Available at: [https://www.epa.gov/sites/production/files/2016-06/documents/uog\\_oil-and-gas-extraction\\_tdd\\_2016.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/uog_oil-and-gas-extraction_tdd_2016.pdf).

<sup>11</sup> SRBC NG Water Use 2016, p. 39.

<sup>12</sup> *Id.*

<sup>13</sup> EPA HF Study 2016, Exec. Sum., p. 11 (Table ES-1).

<sup>14</sup> *Id.*

<sup>15</sup> EPA TDD 2016, p. 43 (Table C-1).

<sup>1</sup> See *New Jersey v. New York*, 347 U.S. 995 (1954).

<sup>2</sup> See generally, 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 (hereinafter, NYS Final SGEIS). Available at: <http://www.dec.ny.gov/energy/75370.html>.

<sup>3</sup> Delaware River Basin Water Code (hereinafter, "Water Code") (18 CFR part 410), § 3.10.3 A.2.

the industry began lengthening its lateral well bores in 2013, the average amount of water used per fracturing event increased to approximately 5.1 to 6.5 million gallons per fracturing event.<sup>16</sup>

Withdrawals from surface and ground water in the amounts required for HVHF may adversely affect aquatic ecosystems and river channel and riparian resources downstream, including wetlands, and may diminish the quantity of water stored in an aquifer or a stream's capacity to assimilate pollutants. Because HVHF operations may significantly increase the volume of water withdrawn in a localized area, they may ultimately upset the balance between the demand on water resources and the availability of those resources for uses protected by the Commission's comprehensive plan, particularly during periods of low precipitation or drought.

**Consumptive use.** In contrast with most domestic and commercial water use, most water used for HVHF is used "consumptively," meaning it is not returned to the basin's usable ground or surface waters. According to the EPA, water accounts for 90 to 97 percent of all hydraulic fracturing fluids injected into a well for the purpose of extracting natural gas.<sup>17</sup> EPA reports further that produced water, or water that flows from and through oil and gas wells to the surface as a by-product of oil and gas production over a ten-year operations period, makes up only 10 to 30 percent of the fluid injected. Accordingly, EPA estimates that 70 to 90 percent of the water used in high volume hydraulic fracturing is permanently removed from the water cycle.<sup>18</sup> The SRBC's estimate is higher. SRBC reports that approximately 96 percent of water withdrawn by the natural gas industry is consumptively used in the hydraulic fracturing process and that the balance of the water is consumptively used for other activities at the drilling pads, such as well drilling, preparation of drilling muds and grout, dust control, maintenance operations, and site reclamation.<sup>19</sup> In contrast, the DRBC estimates that 90 percent of water withdrawn for domestic and commercial uses in the Delaware River Basin is returned to basin waters, either by infiltration into aquifers or by discharge to surface waters after treatment at a wastewater treatment facility.<sup>20</sup>

**Chemical use.** Although chemical additives generally make up the smallest proportion of the overall composition of hydraulic fracturing fluids, they pose a comparatively high risk to ground and surface water quality relative to proppants and base fluids.<sup>21</sup> Additives, which can be a single chemical or a mixture of chemicals, are combined with the base fluid to change its properties, including, for example, to adjust pH, increase fluid thickness, reduce friction, or limit bacterial growth. The EPA has identified 1,084 chemicals reported to have been added to hydraulic fracturing fluids between 2005 and 2013.<sup>22</sup> The choice of which additives to use depends on the characteristics of the targeted rock formation, and in some cases chemical information is considered Confidential Business Information and not disclosed by the fracturing operator.<sup>23</sup> Based upon EPA's analysis, the combination of activities and factors more likely than others to result in more frequent or more severe impacts to water resources are spills during the management of hydraulic fracturing fluids and chemicals that result in large volumes or high concentrations of chemicals reaching groundwater resources.<sup>24</sup> In May 2015, an EPA study compiled data on and characterized 457 hydraulic fracturing related spills that occurred between January 2006 and April 2012 in eleven states.<sup>25</sup> The study attributed these to equipment failure, human error, failure of container integrity, and other causes, including but not limited to well communication, weather and vandalism.<sup>26</sup> Storage, equipment, well or wellhead, hose or line, and "unknown" were among the identified sources.<sup>27</sup> Spills can affect both surface and groundwater resources, both locally and regionally, within the host state and in adjoining states. Pollution from spills and from hydraulic fracturing has occurred in parts of Pennsylvania

outside the basin where high volume hydraulic fracturing is occurring.<sup>28</sup>

**Well drilling and construction.** Well drilling, well construction and well stimulation associated with HVHF also carry risks for groundwater and surface water resources. These risks include turbidity or other disruptions in local ground water formations and local groundwater wells, and contamination of aquifers by fluids pumped into or flowing from rock formations penetrated by the drilling of the well, particularly in the event of a compromised well casing. Typically, the developable shale formations are vertically separated from potential freshwater aquifers by thousands of feet of sandstones and shales of moderate to low permeability. High-volume hydraulic fracturing is engineered to target the prospective hydrocarbon-producing zone. Although the induced fractures create a pathway to the intended wellbore, they typically do not create a discharge mechanism or pathway beyond the fractured zone where none existed before. However, because the well bore penetrates groundwater aquifers and can be a pathway for fluid movement to existing drinking water and other groundwater resources, the mechanical integrity of the well is an important factor that affects the frequency and severity of potential water resource impacts from pollutants. A well with insufficient mechanical integrity can increase the risk of impacts and allow unintended fluid movement, including into drinking water aquifers. Such defects can arise from inadequate well design or construction or can develop over the well's lifetime, including during hydraulic fracturing.<sup>29</sup> In particular, casing and cement can degrade over the life of the well because of exposure to corrosive chemicals, formation stresses, and operational stresses (e.g., pressure and temperature changes during hydraulic fracturing).<sup>30</sup> Gas migration can also potentially occur as a result of poor well construction (i.e., casing and cement problems), or through existing abandoned wells or faults, which may be intersected inadvertently by a new oil or natural gas well. The EPA examined these types of pathways for the migration of hydraulic fracturing fluids and liquids and/or gases that exist in the subsurface to affect the quality of subsurface drinking water resources and

L. Runkle, *Consumptive Water-Use Coefficients for the Great Lakes Basin and Climatically Similar Areas*, U.S. Geological Survey Scientific Investigations Report 2007-5197, p. 13 (Fig. 7). Available at: <https://pubs.usgs.gov/sir/2007/5197/>.

<sup>21</sup> EPA HF Study 2016, Exec. Sum., p. 16.

<sup>22</sup> *Id.* A comprehensive review of chemical additives is provided in EPA TDD 2016, pp. 43-47 (Sec. 1.2).

<sup>23</sup> EPA HF Study 2016, p. 5-20 (Text Box 5-2).

<sup>24</sup> *Id.*, Exec. Sum., p. 1.

<sup>25</sup> U.S. Environmental Protection Agency, *Review of State and Industry Spill Data: Characterization of Hydraulic Fracturing-Related Spills*, May 2015 (EPA/601/R-14/001) (hereinafter "EPA HF Spill Data 2015"), p. 1. Available at: <https://www.epa.gov/hfstudy/review-state-and-industry-spill-data-characterization-hydraulic-fracturing-related-spills-1>.

<sup>26</sup> EPA HF Study 2016, p. 5-42.

<sup>27</sup> *Id.*

<sup>28</sup> See generally, NYS Final SGEIS, Ch. X. Available at: [http://www.dec.ny.gov/docs/materials\\_minerals\\_pdf/fsgeis2015ch10.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/fsgeis2015ch10.pdf).

<sup>29</sup> EPA HF Study 2016, Exec. Sum., p. 24.

<sup>30</sup> *Id.*

<sup>16</sup> SRBC NG Water Use 2016, p. 43.

<sup>17</sup> EPA HF Study 2016, Exec. Sum., p. 10.

<sup>18</sup> *Id.*, p. 12 (Fig. ES-4(a)).

<sup>19</sup> SRBC NG Water Use 2016, p. 38.

<sup>20</sup> For comparison with climatically similar areas and the world, see Kimberly H. Schaffer and Donna

reported on failures and impacts to water resources in detail.<sup>31</sup>

*Wastewater handling and disposal.* “Produced water” (including “flowback” water) refers to any water or fluid returned to the surface through the production well as a waste product of hydraulic fracturing. This material may be stored in tanks or other containers on the pad site before it is transferred for off-site treatment and/or disposal. The composition of produced water depends on the composition of the injected hydraulic fracturing fluid and the composition of the target formation. In the Marcellus region, produced water is generated in large quantities and often contains high concentrations of total dissolved solids (TDS or “salts”) and constituents that may be harmful to human health and the environment. Produced water from HVHF in the Marcellus formation has been found to contain:<sup>32</sup>

- Salts, including chloride, bromide, sulfate, sodium, magnesium, and calcium;
- Metals, including barium, manganese, iron, and strontium;
- Naturally-occurring organic compounds, including benzene, toluene, ethylbenzene, xylenes (BTEX), and oil and grease;
- Radioactive materials, including radium; and
- Hydraulic fracturing chemicals and their chemical transformation products.

The disposal of produced water poses a significant risk to the water resources of the basin if the wastewater is not properly managed. The concentration of TDS in produced water can be high enough that if discharged untreated to surface water, the potential exists to adversely affect designated uses of surface water, including drinking water, aquatic life support, livestock watering, irrigation, and industrial use. Because produced water contains high TDS and dissolved inorganic constituents that most publicly owned treatment works and other municipal wastewater treatment facilities are not designed to remove, these constituents can be discharged untreated from such facilities; can disrupt treatment processes, for example by inhibiting biological treatment; can accumulate in biosolids (sewage sludge), limiting their beneficial use; and can facilitate the formation of harmful disinfection byproducts.<sup>33</sup> Where produced water

has been discharged to domestic wastewater treatment facilities in the past, elevated concentrations of chloride and bromide have been documented in the receiving waters.<sup>34</sup> The discharge of bromide upstream of drinking water intakes has led in documented instances to the formation of carcinogenic disinfection by-products at drinking water utilities.<sup>35</sup>

The EPA since 1979 has required zero discharge of pollutants to waters of the United States from onshore oil and gas extraction wastewater. In 2016 EPA finalized a rule establishing pretreatment standards for discharges of wastewater from onshore unconventional oil and gas extraction facilities to municipal sewage treatment plants (also known as “publicly owned treatment works” or POTWs).<sup>36</sup> The recent EPA rule will protect POTWs from disruptions in their operations that can be caused by these wastewaters. However, the rule does not extend to commercially owned treatment works that primarily treat domestic and commercial wastewater, and it does not address the discharge to POTWs of produced water that has been partially treated at centralized waste treatment facilities. Thus, significant risks associated with the treatment and discharge of produced water remain outside the scope of current federal regulations.

*Siting and Landscapes.* Certain water resources in the basin have high water resource value because of their excellent water quality or their exceptional ability to perform water supply, ecological, recreational or other water-related functions. The Commission has classified certain of these waters as Special Protection Waters through provisions of its Water Code incorporated in the comprehensive plan.<sup>37</sup> The Water Code seeks to maintain or improve the condition of these water resources through regulatory requirements such as prevention of measurable change to existing water quality, evaluation of natural wastewater treatment system

alternatives, conditions or limitations on wastewater treatment facilities and control of non-point sources.<sup>38</sup>

Many high value water resources are associated with and dependent on their surrounding landscapes. Special Protection Waters are located in the upper portion of the basin where forested headwater areas and riparian buffers slow the rate and volume of stormwater runoff, replenish groundwater that serves as a source of drinking water and sustains stream flow, and control the introduction of pollutants into streams. These landscape features are particularly effective at controlling non-point source pollution that may occur following precipitation events.

High volume hydraulic fracturing and the related alteration of landscapes required to support that activity pose risk to high value water resources. It is expected that practically all of the development and related disturbances from high volume hydraulic fracturing would occur in the drainage area of Special Protection Waters.<sup>39</sup> Approximately 70 percent of the basin area underlain by the Marcellus and Utica shales (largely in the drainage area of Special Protection Waters) is forested. The average total disturbance associated with a single well pad, including associated access roads and utility corridors, is estimated at 7.7 acres.<sup>40</sup> Off-site facilities such as gathering lines involve additional disturbances. These landscape changes will reduce forested areas and potentially vegetated buffers, increase non-point source pollution, diminish groundwater infiltration, and risk adversely affecting water quality and quantity in surface and groundwater. Because high volume hydraulic fracturing would most likely occur in headwater areas in the drainage area to Special Protection Waters, the risks of degrading water resources and impairing the effectuation of the comprehensive plan are of particular concern.

*Uncertainty.* The comprehensive EPA and New York DEC studies cited above report multiple instances of damage to water resources associated with all stages of the natural gas development process, and importantly, both sources emphasize the degree of uncertainty

<sup>38</sup> *Id.*

<sup>39</sup> See DRBC map at: <http://www.nj.gov/drbc/library/documents/maps/SPW-MarcellusShale.pdf>.

<sup>40</sup> E.T. Slonecker *et al.*, *Landscape Consequences of Natural Gas Extraction in Allegheny and Susquehanna Counties, Pennsylvania, 2004–2010*; U.S. Department of the Interior U.S. Geological Survey, *Open-File Report 2013–1025*, p. 19 (Table 2) (converted to acres).

Standards for the Oil and Gas Extraction Point Source Category, Final Rule, 81 FR 41845, 41847c.

<sup>34</sup> William D. Burgos *et al.*, *Watershed-Scale Impacts from Surface Water Disposal of Oil and Gas Wastewater in Western Pennsylvania*. *Environ. Sci. Technol.*, 2017, 51 (15), pp. 8851–8860.

Available at: <http://pubs.acs.org/doi/abs/10.1021/acs.est.7b01696>.

<sup>35</sup> Kimberly M. Parker *et al.*, *Enhanced formation of disinfection byproducts in shale gas wastewater-impacted drinking water supplies*. *Environ. Sci. Technol.* 2014 Oct 7; 48 (19), pp. 11161–9.

Available at: <http://pubs.acs.org/doi/abs/10.1021/es5028184>.

<sup>36</sup> *Id.*, pp. 41485–41857.

<sup>37</sup> See Water Code, § 3.10.3 A.2, 18 CFR part 410.

<sup>31</sup> *Id.*, pp. 23–29. Also see Main Report, Ch. 6.

<sup>32</sup> See generally, EPA TDD 2016, pp. 59–81 (part C.3) for a comprehensive characterization of produced water that includes a significant number of data points for the Marcellus formation.

<sup>33</sup> United States Environmental Protection Agency, *Effluent Limitations Guidelines and*

regarding potential future effects. The EPA report states:

*Cases of impacts were identified for all stages of the hydraulic fracturing water cycle. Identified impacts generally occurred near hydraulically fractured oil and gas production wells and ranged in severity, from temporary changes in water quality to contamination that made private drinking water wells unusable. . . . However, significant data gaps and uncertainties in the available data prevented us from calculating or estimating the national frequency of impacts on drinking water resources from activities in the hydraulic fracturing water cycle. The data gaps and uncertainties described in this report also precluded a full characterization of the severity of impacts.*<sup>41</sup>

The New York State DEC study asserts:

. . . a broad range of experts from academia, industry, environmental organizations, municipalities, and the medical and public health professions commented and/or provided their analyses of high-volume hydraulic fracturing. The comments referenced an increasing number of ongoing scientific studies across a wide range of professional disciplines. These studies and expert comments evidence that significant uncertainty remains regarding the level of risk to public health and the environment that would result from permitting high-volume hydraulic fracturing in New York, and regarding the degree of effectiveness of proposed mitigation measures. In fact, the uncertainty regarding the potential significant adverse environmental and public health impacts has been growing over time.

*Potential significant adverse impacts on water resources exist with regard to potential degradation of drinking water supplies; impacts to surface and underground water resources due to large water withdrawals for high-volume hydraulic fracturing; cumulative impacts; stormwater runoff; surface spills, leaks and pit or surface impoundment failures; groundwater impacts associated with well drilling and construction and seismic activity; [and] waste disposal. . . .*<sup>42</sup>

Additional detail regarding damages to water resources and the risks, vulnerabilities and impacts to surface and ground water resources associated with HVHF can be found in the cited reports.

### Related Statutory and Regulatory Provisions

The proposed rules regarding hydraulic fracturing arise from clauses of the Commission's organic statute, the Delaware River Basin Compact ("Compact"),<sup>43</sup> and from provisions of

the Delaware River Basin Water Code, comprehensive plan and past determinations.

The Compact recognizes the water and related resources of the Delaware River Basin as regional assets vested with local, state, and national interests, for which the signatory parties have shared responsibility.<sup>44</sup> The Compact further recognizes that the economic development of the region as a whole and the health, safety, and general welfare of its population will remain vitally affected by management of these resources.<sup>45</sup> Through the Compact, the signatory parties expressly provided that "[t]he commission may assume jurisdiction to control future pollution and abate existing pollution in the waters of the basin, whenever it determines after investigation and public hearing upon due notice that the effectuation of the comprehensive plan so requires."<sup>46</sup>

By regulation, the Commission has determined that the basin's waters are limited in quantity and that frequent drought warnings and drought declarations are needed due to limited water supply, storage and streamflow during dry periods. For these reasons, the Commission has adopted a policy of discouraging exportations of water from the basin.<sup>47</sup> The Commission also has recognized that the basin's waters have limited assimilative capacity and in particular, limited capacity to accept conservative substances without significant impacts. On this basis and on grounds that the assimilative capacity of the basin's waters should be reserved for in-basin users, the Commission has adopted a policy of discouraging the importation of wastewater into the basin when it would significantly reduce the assimilative capacity of the receiving stream.<sup>48</sup> No credit toward meeting wastewater treatment requirements is granted for wastewater imported into the basin when wasteload allocations have been established.<sup>49</sup> The Commission in 2000 determined by resolution that allocations of the waste assimilative capacity of the Delaware River Estuary are necessary to maintain stream quality objectives in Zones 2, 3, 4 and 5 for acute and chronic toxicity<sup>50</sup> and in Zones 2 and 3 for the chemicals

1, 2 dichloroethane and tetrachloroethene.<sup>51</sup>

The Commission's Special Protection Waters program establishes a water quality objective of no measurable change in existing water quality except towards natural conditions in waters that the Commission has designated as of exceptionally high scenic, recreational, ecological, and/or water supply value. The Commission has so designated virtually all of the non-tidal main stem, as well as the portions of tributaries to the main stem located within the Delaware Water Gap National Recreation Area.<sup>52</sup>

The Commission has determined that the basin's underground water resources are to be "used, conserved, developed, managed, and controlled in view of the need of present and future generations." To that end, it has provided by rule that interference, impairment, penetration, or artificial recharge of groundwater may be subject to the Commission's review.<sup>53</sup> In accordance with Commission regulations, substances or properties in harmful or toxic concentrations or that produce color, taste, or odor of the water may not be "permitted or induced by the activities of man to become ground water."<sup>54</sup> The Commission has asserted by rule that it may establish requirements, conditions, or prohibitions that in its judgment are necessary to protect ground water quality.<sup>55</sup>

### Summary of Proposed Rules

*Prohibition.* Section 5.2 of the Compact authorizes the Commission to "assume jurisdiction to control future pollution . . . in the waters of the basin, whenever it determines after investigation and public hearing upon due notice that the effectuation of the comprehensive plan so requires." It further authorizes the Commission to control pollution from industrial or other waste originating within a basin state so that the pollution does not "injuriously affect the waters of the basin as contemplated by the comprehensive plan." The Commission may also adopt rules, regulations and standards to control future pollution. Considering the totality of the risks that HVHF poses to basin water resources, the Commission proposes in Section 440.3(b) of the draft rule to determine that controlling pollution by prohibiting high volume hydraulic fracturing in the

<sup>41</sup> EPA HF Study 2016, Exec. Sum., p. 2.

<sup>42</sup> NYS Final SGEIS 2016, pp. 1, 13.

<sup>43</sup> United States Public Law 87-328, Approved Sept. 27, 1961, 75 Statutes at Large 688; 53 Delaware Laws, Ch. 71, Approved May 26, 1961; New Jersey Laws of 1961, Ch. 13, Approved May 1, 1961; New York Laws of 1961, Ch. 148,

Approved March 17, 1961; Pennsylvania Acts of 1961, Act. No. 268, Approved July 7, 1961.

<sup>44</sup> See Delaware River Basin Compact (hereinafter, "Compact"), Part I, 1st Whereas clause.

<sup>45</sup> See *id.*, 8th Whereas clause.

<sup>46</sup> See *id.*, § 5.2.

<sup>47</sup> See Water Code, § 2.30.2.

<sup>48</sup> See *id.*

<sup>49</sup> See *Id.*, § 2.30.6.

<sup>50</sup> See DRBC Resolution No. 2000-4, "Be it resolved" par. 4.

<sup>51</sup> See *id.*, "Be it resolved" par. 1.

<sup>52</sup> See Water Code, §§ 3.10.3. A.2. and A.2.e.

<sup>53</sup> *Id.*, § 2.20.6.

<sup>54</sup> See *id.*, § 3.40.5 B.1.

<sup>55</sup> See *id.*, § 3.40.5 B.3.

basin is required to effectuate the comprehensive plan, avoid injury to the waters of the basin as contemplated by the comprehensive plan and protect the public health and preserve the waters of the Basin for uses in accordance with the comprehensive plan.

*Water Exports.* The transfer of surface water, groundwater, treated wastewater or mine drainage water, at any rate or volume, for utilization in hydraulic fracturing to produce oil and gas outside the Delaware River Basin is proposed to require Commission approval.

Currently, exports of water from the basin of less than the daily average quantity of 100,000 gallons are deemed to have no substantial effect on the basin's water resources and are thus not reviewed by the Commission under section 3.8 of the Compact. The Commission has a longstanding policy of discouraging exportations of water on the grounds that the availability of water to meet in-basin needs is limited and low-flow and drought conditions are frequent. Unlike regulated withdrawals for domestic, commercial and industrial water supplies, withdrawals of large quantities of water for hydraulic fracturing to produce oil and gas have the potential, if unregulated, to occur through de-centralized, periodic and transient means and thus to adversely affect headwater streams and minimum flows of surface and groundwater, and to impair uses protected by the Commission's comprehensive plan. The proposed rule will make all proposed exports of water for oil and gas extraction subject to the requirement that alternatives involving no exportation be analyzed and that the water resource, economic and social impacts of the proposal be evaluated.

*Wastewater.* As set forth above, the data available on produced water (including flowback) from hydraulically fractured wells in the Marcellus formation indicate that this waste stream is unlike other industrial and domestic waste streams treated and discharged in the Delaware River Basin, and that it poses significant risks to human health and the environment if improperly handled. Under the proposed rules, the "produced water" from the hydrocarbon-bearing strata during oil and gas extraction is broadly defined to include untreated produced water, diluted produced water, and produced water mixed with other wastes. The rule provides that this material may not be transferred to, treated by or discharged from or to a new or existing wastewater treatment facility located within the Delaware River Basin, at any volume or rate, except in accordance with an approval

in the form of a docket issued by the Commission to the owner or operator of the wastewater treatment facility or in accordance with a state permit issued pursuant to a duly adopted administrative agreement between the Commission and the host state. The rule further provides that produced water may not be treated within the basin except at a centralized waste treatment facility (CWT) as that term is defined by the EPA in 40 CFR part 437 and may not be discharged within the basin without treatment at a CWT. Because current EPA regulations governing treatment by CWTs do not include limitations for pollutants commonly found in produced water, such as total dissolved solids, barium, bromide, radium and strontium,<sup>56</sup> the proposed rule also places conditions on the treatment and discharge of wastewater or effluent resulting from the treatment of produced water by a CWT ("CWT wastewater") before the CWT wastewater can be discharged to basin waters or to another treatment facility within the basin.

The Commission already has in place a policy to discourage the importation of wastewater into the basin due to the limited capacity of the basin's waters to assimilate waste. Proposals to import produced water and CWT wastewater into the basin will be subject to this policy and to the requirements that alternatives involving no importation be analyzed and that the water resource, economic and social impacts of the proposal be evaluated.

Under the proposed rules, projects involving the treatment and discharge of produced water within the basin must meet the more stringent of applicable federal, state and DRBC requirements. Additional effluent limitations are proposed to apply to such projects for TDS, whole effluent toxicity, and a set of "pollutants of concern" identified on the basis of produced water characterizations provided by EPA in a 2016 technical document.<sup>57</sup> The majority of the EPA's primary and secondary drinking water standards are also proposed as treatment levels for produced water discharged to a receiving waterbody designated for use as a public water supply. Treatability

studies will be required to ensure that pollutant loads from natural gas wastewater are thoroughly characterized and that treatment ensures these pollutants are effectively reduced or eliminated, such that applicable effluent limits, stream quality objectives, protected uses, and in the case of Special Protection Waters, the "no measurable change" objective, are attained. Because the proposed rule requires treatment to "background concentrations" for pollutants of concern in many instances, the Commission is simultaneously publishing draft guidance on acceptable methods for determining background concentrations of these pollutants.

*Other changes.* Revisions to the Commission's thresholds for review set forth at 18 CFR 401.35 are proposed to establish that certain activities relating to hydraulic fracturing in hydrocarbon-bearing formations are deemed to constitute projects having a substantial effect on water resources of the basin and are thus subject to review under Section 3.8 of the Compact. These include: the importation, treatment, or discharge to basin land or water of "produced water" as defined by the rule; and the exportation of water from the basin for uses related to hydraulic fracturing. Although certain additional activities and facilities on a well pad site could be separately identified by the Commission as projects, in light of the proposed prohibition, no changes to existing rules are proposed in this regard at this time. Minor changes are concurrently proposed to existing thresholds for the Commission's review of leachate discharges and wetlands.

To provide for appropriate fees to cover the cost of reviews of new classes of projects deemed to require the Commission's approval, changes are also proposed to section 401.43 (regulatory program fees).

#### Executive Director Determinations

The final regulations relating to natural gas development when adopted will supersede and replace the Executive Director's Determinations issued on May 19, 2009, June 14, 2010 and July 23, 2010.

#### Public Process

*Substance of comments:* The Commission expressly seeks comment on the effects the proposed rules may have within the basin on: Water availability, the control and abatement of water pollution, economic development, the conservation and protection of drinking water supplies, the conservation and protection of aquatic life, the conservation and

<sup>56</sup> United States Environmental Protection Agency, Final 2014 Effluent Guidelines Program Plan, July 2015 (EPA-821-R-15-002), p. 5-4 (sec. 5.3.2). Available at: <https://www.epa.gov/sites/production/files/2015-09/documents/final-2014-effluent-guidelines-program-plan-july-2015.pdf>. A detailed EPA study of the CWT industry focused on facilities accepting oil and gas extraction wastewaters is ongoing. See Preliminary 2016 Effluent Guidelines Program Plan, June 2016 (EPA-821-R-16-001), p. 6-1 (sec. 6.1).

<sup>57</sup> See EPA TDD 2016, pp. 59-81 (Part C.3).

protection of water quality in Special Protection Waters, and the protection, maintenance and improvement of water quantity and quality basinwide.

Comment is also requested on whether use of base fluids other than water for HVHF is practical within the basin and if so, how it should be addressed in these rules, and on any alternatives to the proposed rules that the commenters would like the Commission to consider, as well as on draft guidance published simultaneously with the rules for determining background concentrations of certain pollutants. The Commission welcomes and will consider any other comments that concern the potential effects of the draft rules on the conservation, utilization, development, management and control of the water and related resources of the Delaware River Basin. Comments on matters not within this scope may not be considered.

Non-digitized voluminous materials such as books, journals or collected letters/petitions will not be accepted. Digital submissions of these, as well as articles and websites, must be accompanied by a statement containing citations to the specific findings or conclusions the commenter wishes to reference.

#### *Submission of written comments.*

Written comments along with any attachments may be submitted through the Commission's web-based comment system (<http://dockets.drbc.commentinput.com>) until 5 p.m. on March 30, 2018. All materials should be provided in searchable formats, preferably in .pdf searchable text. Notably, a picture scan of a document may not result in searchable text. Comments received through any method other than the designated online method, including *via* email, fax, postal/delivery services or hand delivery, will not be considered or included in the rulemaking record unless an express exception has been granted. Requests for exceptions to the web-based-submissions-only policy based on lack of access to the web-based comment system may be addressed to: Commission Secretary, DRBC, P.O. Box 7360, West Trenton, NJ 08628.

*Public hearings.* To reduce uncertainty on the part of attendees about whether they will have a seat and an opportunity to speak at a public hearing, and to provide for a safe and orderly process, the Commission is requiring registration online or on-site to attend each public hearing. Use of the online, web-based registration system is encouraged, as this system will track and publish in real time the available capacity for each hearing. Key dates,

times and addresses are set forth at the top of this notice. Key elements of the procedure are as follows:

- Online or on-site registration is required to attend each public hearing.
- Online registration to attend will remain open until 5 p.m. the day prior to each hearing.
- On-site registration will be available at all in-person hearing venues.
- Available capacity for each in-person hearing will be posted on the web-based registration system. When users access the system, they will see the number of seats still available or if the venue is at capacity.
- If capacity has been reached for a specific hearing, online registrants will be placed on a waiting list.
- Those who do not register to attend a hearing in advance are advised to check the availability of seats BEFORE planning travel to a hearing.
- Public hearing registrants will be afforded opportunities to request speaking time.
- If more people request to speak than time allows, those not assigned time will be placed on a waiting list.
- If fewer people request to speak than time allows, additional opportunities to request time will be provided on or before the hearing date.
- Elected government officials and their staff will have the opportunity to identify themselves when registering to attend a hearing.
- Written and oral comment will receive equal consideration.

The Commission appreciates the public's participation and input on this important matter. In order to provide as many individuals who wish to speak as possible with an opportunity to do so, each person will be limited to one time slot at one hearing location. Depending on the number who wish to be heard, speakers will be limited to two or three minutes. To ensure that scheduled public hearings meet the objectives of the Commission and the interested public in a safe and orderly process, it is essential that public hearing procedures are understood and followed. Participants are asked to review all DRBC public hearing procedures at: [http://www.state.nj.us/drbc/library/documents/procedures\\_public-hearings050317.pdf](http://www.state.nj.us/drbc/library/documents/procedures_public-hearings050317.pdf). The Commission's policies related to speaker conduct, audience conduct, safety, security, signs, placards and banners will be in effect at these public hearings. The public is reminded that oral and written comments will receive the same consideration.

*More Information Available.* Detailed and up-to-date information about the public process, including a version of

the proposed rule text that shows proposed additions and deletions to 18 CFR part 401, draft guidance concerning the calculation of background pollutant concentrations (associated with proposed 18 CFR part 440) and links for online registration to attend each of the scheduled public hearings can be found on the DRBC website, [drbc.net](http://drbc.net), at [http://www.nj.gov/drbc/meetings/proposed/notice\\_hydraulic-fracturing.html](http://www.nj.gov/drbc/meetings/proposed/notice_hydraulic-fracturing.html).

#### List of Subjects

##### *18 CFR Part 401*

Administrative practice and procedure, Penalties, Water pollution control, Water resources.

##### *18 CFR Part 440*

Water pollution control, Water resources, Water supply, Waste treatment and disposal.

For the reasons set forth in the preamble, the Delaware River Basin Commission proposes to amend title 18, chapter III of the Code of Federal Regulations as follows:

#### **PART 401—RULES OF PRACTICE AND PROCEDURE**

- 1. The authority citation for part 401 continues to read as follows:

**Authority:** Delaware River Basin Compact (75 Stat. 688), unless otherwise noted.

- 2. Amend § 401.35 by:
  - a. Revising introductory text to paragraph (a) and paragraphs (a)(2), (4), (5), (15), (16) and (18);
  - b. Redesignating paragraph (a)(19) as (a)(20);
  - c. Adding a new paragraph (a)(19);
  - d. Removing paragraph (b)(14);
  - e. Redesignating paragraphs (b)(15) through (18) as (b)(14) through (17);
  - f. Revising newly redesignated paragraph (b)(14);
  - g. Revising newly redesignated paragraph (b)(17);
  - h. Adding new paragraphs (b)(18) and (19);
  - i. Revising paragraph (c);
  - j. Removing paragraph (d).

The revisions and additions read as follows:

##### **§ 401.35 Classification of projects for review under section 3.8 of the Compact.**

(a) Except as the Commission may specially direct by notice to the project owner or sponsor, a project in any of the following classifications will be deemed not to have a substantial effect on the water resources of the Basin and is not required to be submitted under section 3.8 of the Compact:

\* \* \* \* \*

(2) A withdrawal from ground water when the daily average gross

withdrawal during any 30 consecutive day period does not exceed 100,000 gallons;

\* \* \* \* \*

(4) Except as provided at paragraph (b)(18) of this section, the construction of new domestic sewage treatment facilities or alteration or addition to existing domestic sewage treatment facilities when the design capacity of such facilities is less than a daily average rate of 10,000 gallons per day in the drainage area to Outstanding Basin Waters and Significant Resource Waters or less than 50,000 gallons per day elsewhere in the Basin; and all local sewage collector systems and improvements discharging into authorized trunk sewage systems;

(5) Except as provided at paragraph (b)(18) of this section, the construction of new facilities or alteration or addition to existing facilities for the direct discharge to surface or ground waters of industrial wastewater having design capacity of less than 10,000 gallons per day in the drainage area to Outstanding Basin Waters and Significant Resource Waters or less than 50,000 gallons per day elsewhere in the Basin; except where such wastewater contains toxic concentrations of waste materials;

\* \* \* \* \*

(15) Draining, filling or otherwise altering marshes or wetlands when the area affected is less than 25 acres; provided; however, that areas less than 25 acres shall be subject to Commission review and action where neither a state nor a federal level review and permit system is in effect;

(16) Except as provided at paragraph (b)(19) of this section, the diversion or transfer of water from the Delaware River Basin (exportation) whenever the design capacity is less than a daily average rate of 100,000 gallons;

\* \* \* \* \*

(18) Except as provided at paragraph (b)(18) of this section, the diversion or transfer of wastewater into the Delaware River Basin (importation) whenever the design capacity is less than a daily average rate of 50,000 gallons; and

(19) To the extent allowed in the basin (see prohibition at § 440.3(b) of this title), projects involving hydraulic fracturing, unless no state-level review and permit system is in effect;

\* \* \* \* \*

(b) \* \* \*

(14) Leachate treatment and disposal projects associated with landfills and solid waste disposal facilities in the basin;

\* \* \* \* \*

(17) Any other project that the Commission may specially direct by notice to the project sponsor or land owner as having a potential substantial water quality impact on waters classified as Special Protection Waters.

(18) The importation, treatment, or discharge to basin land or water of “produced water” or CWT wastewater as those terms are defined in § 440.2 of this chapter.

(19) The transfer, diversion or exportation of water from the basin at any volume or rate for uses related to “hydraulic fracturing” as that term is defined in § 440.2 of this chapter.

(c) Regardless of whether expressly excluded from review by paragraph (a) of this section, any project or class of projects that in the view of the Commission could have a substantial effect on the water resources of the basin may, upon special notice to the project sponsor or landowner, be subject to the requirement for review under section 3.8 of the Compact.

- 3. Amend § 401.43 by:
  - a. Revising paragraphs (b)(1) introductory text, (b)(1)(iii) introductory text and (b)(2)(i);
  - b. Adding paragraph (b)(3)(v);
  - c. Revising paragraphs (b)(4)(iii) and (c);
  - d. Revising Tables 1 and 2.

The revisions and additions read as follows:

**§ 401.43 Regulatory program fees.**

\* \* \* \* \*

(b) \* \* \*

(1) *Application fee.* Except as set forth in paragraph (b)(1)(iii) of this section, the application fee shall apply to:

\* \* \* \* \*

(iii) *Exemptions.* The application fee shall not apply to:

\* \* \* \* \*

(2) *Annual monitoring and coordination fee.* (i) Except as provided in paragraph (b)(2)(ii) of this section, an annual monitoring and coordination fee shall apply to each active water allocation or wastewater discharge approval issued pursuant to the Compact and implementing regulations, regardless of whether the approval was issued by the Commission in the form of a docket, permit or other instrument, or by a Signatory Party Agency under the One Permit Program rule (§ 401.42).

(3) \* \* \*

(v) A project involves treatability studies for the discharge of wastewater.

(4) \* \* \*

(iii) *Modification of a DRBC approval.* Following Commission action on a project, each project revision or modification that the Executive Director deems substantial shall require an additional application fee calculated in accordance with paragraph (e) of this section and subject to an alternative review fee in accordance with paragraph (b)(3) of this section.

\* \* \* \* \*

(c) *Indexed adjustment.* On July 1 of every year, beginning July 1, 2017, all fees established by this section will increase commensurate with any increase in the annual April 12-month Consumer Price Index (CPI) for Philadelphia, published by the U.S. Bureau of Labor Statistics during that year.<sup>1</sup> In any year in which the April 12-month CPI for Philadelphia declines or shows no change, the application fee and annual monitoring and coordination fee will remain unchanged. Following any indexed adjustment made under this paragraph (c), a revised fee schedule will be published in the **Federal Register** by July 1 and posted on the Commission’s website. Interested parties may also obtain the fee schedule by contacting the Commission directly during business hours.

\* \* \* \* \*

TABLE 1 TO § 401.43—APPLICATION FEES

Project type	Application fee	Fee maximum
Water Allocation .....	\$405 per million gallons/month of allocation, <sup>1</sup> not to exceed \$15,190. <sup>1</sup> Fee is doubled for any portion to be exported from the basin.	Greater of: \$15,190 <sup>1</sup> or Alternative Review Fee.
Wastewater Discharge .....	Private projects: \$1,013. <sup>1</sup> Public projects: \$506. <sup>1</sup> Projects involving wastewater treatability studies: \$5,000. <sup>1</sup>	Alternative Review Fee.

<sup>1</sup> Consumer Price Index—U/Series ID: CWURA102SA0/Not Seasonally Adjusted/Area:

Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD/Item: All items/Base Period: 1982–84=100.

TABLE 1 TO § 401.43—APPLICATION FEES—Continued

Project type	Application fee	Fee maximum
Other .....	0.4% of project cost up to \$10,000,000 plus 0.12% of project cost above \$10,000,000 (if applicable), not to exceed \$75,951. <sup>1</sup>	Greater of: \$75,951 <sup>1</sup> or Alternative Review Fee.

<sup>1</sup> Subject to an annual adjustment in accordance with paragraph (c) of this section.

TABLE 2 TO § 401.43—ANNUAL MONITORING AND COORDINATION FEE

Annual fee	Allocation
<b>Water Allocation</b>	
\$304 <sup>1</sup> .....	<4.99 mgm.
\$456 <sup>1</sup> .....	5.00 to 49.99 mgm.
\$658 <sup>1</sup> .....	50.00 to 499.99 mgm.
\$835 <sup>1</sup> .....	500.00 to 9,999.99 mgm.
\$1,013 <sup>1</sup> .....	> or = to 10,000 mgm.
<b>Wastewater Discharge</b>	
Annual fee	Discharge design capacity
\$304 <sup>1</sup> .....	<0.05 mgd.
\$618 <sup>1</sup> .....	0.05 to 0.99 mgd.
\$830 <sup>1</sup> .....	1 to 9.99 mgd.
\$1,013 <sup>1</sup> .....	> or = to 10 mgd.

<sup>1</sup> Subject to annual adjustment in accordance with paragraph (c) of this section.

\* \* \* \* \*

■ 4. Add Part 440 to Subchapter B—Special Regulations to read as follows:

**PART 440—HYDRAULIC FRACTURING IN SHALE AND OTHER FORMATIONS**

- Sec.
- 440.1 Purpose, authority and relationship to other requirements.
- 440.2 Definitions.
- 440.3 High volume hydraulic fracturing (HVHF).
- 440.4 Exportation of water for hydraulic fracturing.
- 440.5 Produced water.

**Authority:** Delaware River Basin Compact (75 Stat. 688).

**§ 440.1 Purpose, authority and relationship to other requirements.**

(a) *Purpose.* The purpose of this part is to protect and conserve the water resources of the Delaware River Basin. To effectuate this purpose, this section establishes standards, requirements, conditions and restrictions to prevent or reduce depletion and degradation of surface and groundwater resources and to promote sound practices of water resource management.

(b) *Authority.* This part implements sections 1.5, 3.6(b), 3.8, 4.1, 5.2, 7.1, 13.1 and 14.2(a) of the Delaware River Basin Compact.

(c) *Comprehensive plan.* The Commission has determined that the provisions of this part are required for the immediate and long-range development and use of the water

resources of the Basin and are therefore incorporated into the Commission’s comprehensive plan.

(d) *Relationship to other Commission requirements.* (1) The provisions of this part are in addition to all applicable requirements in other Commission regulations, dockets and permits.

(2) Upon the effective date of this rule, the Executive Director Determinations dated May 19, 2009, June 14, 2010 and July 23, 2010, to the extent not already superseded by the Commission’s Resolution dated December 8, 2010, are no longer operative.

(e) *Severability.* The provisions of this part are severable. If any provision of this part or its application to any person or circumstances is held invalid, the invalidity will not affect other provisions or applications of this part, which can be given effect without the invalid provision or application.

(f) *Coordination and avoidance of duplication.* In accordance with and pursuant to section 1.5 of the Delaware River Basin Compact, to the fullest extent it finds feasible and advantageous the Commission may enter into an Administrative Agreement (Agreement) with any basin state or the federal government to coordinate functions and eliminate unnecessary duplication of effort. Such Agreements will be designed to: Effectuate intergovernmental cooperation, minimize the efforts and duplication of state and Commission staff resources wherever possible, ensure compliance with Commission-approved requirements, enhance early notification of the general public and other interested parties regarding proposed activities in the basin, indicate where a host state’s requirements satisfy the Commission’s regulatory objectives and clarify the relationship and project review decision making processes of the states and the Commission for projects subject to review by the states under their state authorities and by the Commission under section 3.8 and articles 6, 7, 10 and 11 of the Compact.

**§ 440.2 Definitions.**

For purposes of this part, the following terms and phrases have the meanings provided. Some definitions differ from those provided in

regulations of one or more agencies of the Commission’s member states and the federal government.

*Basin*—The area of drainage into the Delaware River and its tributaries, including Delaware Bay.

*Centralized waste treatment facility (CWT)*—As defined by EPA at 40 CFR 437.2(c), any facility that treats (for disposal, recycling or recovery of material) any hazardous or non-hazardous industrial wastes, hazardous or non-hazardous industrial wastewater, and/or used material received from off-site. “CWT facility” includes both a facility that treats waste received exclusively from off-site and a facility that treats wastes generated on-site as well as waste received from off-site.

*Commission*—The Delaware River Basin Commission (DRBC) created and constituted by the Delaware River Basin Compact.

*Conservative substances*—Pollutants that undergo no or minimal transformation or decay in a water body or groundwater, except by dilution.

*CWT wastewater*—For purposes of this part, “CWT wastewater” means any wastewater or effluent resulting from the treatment of produced water by a CWT.

*Docket*—A legal instrument issued by the Commission approving, or approving as modified, a project having a substantial effect on water resources of the basin. The approval may modify the project by imposing conditions to prevent the project from substantially impairing or conflicting with the Commission’s comprehensive plan.

*Domestic wastewater*—Liquid waste that contains pollutants produced by a domestic residence or residences or by a non-residential facility that generates wastewater with the same characteristics as residential wastewater.

*Executive Director*—The Executive Director of the Delaware River Basin Commission.

*Flowback*—Fluids returned to the surface through an oil or gas well once hydraulic fracturing pressure is released. Flowback can also refer to the stage of well completion in which fluids are returned to the surface through the well after fracturing is performed.

*Groundwater*—Includes all water beneath the surface of the ground.

**High-volume hydraulic fracturing (HVHF)**—Hydraulic fracturing using a combined total of 300,000 or more gallons of water during all stages in a well completion, whether the well is vertical or directional, including horizontal, and whether the water is fresh or recycled and regardless of the chemicals or other additives mixed with the water.

**Hydraulic fracturing**—A technique used to stimulate the production of oil and natural gas from a well by injecting fracturing fluids down the wellbore under pressure to create and maintain induced fractures in the hydrocarbon-bearing rock of the target geologic formation.

**Fracturing fluid(s)**—A mixture of water (whether fresh or recycled) and/or other fluids and chemicals or other additives, which are injected into the subsurface and which may include chemicals used to reduce friction, minimize biofouling of fractures, prevent corrosion of metal pipes or remove drilling mud damage within a wellbore area, and propping agents such as silica sand, which are deposited in the induced fractures.

**Person**—Any natural person, corporation, partnership, association, company, trust, federal, state or local governmental unit, agency, or authority, or other entity, public or private.

**Pollutants**—Any substance which when introduced into water resources, including surface water or groundwater, degrades natural or existing water quality, including but not limited to: Dredge spoils, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemicals and chemical wastes, biological materials, radioactive materials, methane, heat, wrecked or discarded equipment, rock, sand, sediment, cellar dirt, and industrial, municipal or agricultural waste as well as any substance defined as a pollutant, contaminant or hazardous substance by any federal or state statute or regulation.

**Pollutants of concern**—Conservative, radioactive, toxic or other substances that are potentially present in produced water, consisting of all parameters listed in the EPA *Technical Development Document for the Effluent Limitations Guidelines and Standards for the Oil and Gas Extraction Point Source Category* (June 2016), specifically all pollutants for produced water listed in Tables C–11, C–13, C–15, C–17, and C–19.

**Produced water**—The water that flows out of an oil or gas well, typically including other fluids and pollutants and other substances from the hydrocarbon-bearing strata. Produced water may contain “flowback” fluids,

fracturing fluids and any chemicals injected during the stimulation process, formation water, and constituents leached from geologic formations. For purposes of §§ 401.35(b)(18) and 440.5, the term “produced water” encompasses untreated produced water, diluted produced water, and produced water mixed with other wastes.

**Wastewater treatment facility**—Any facility treating and discharging wastewater.

**Water resource(s)**—Water and related natural resources in, on, under, or above the ground, including related uses of land, which are subject to beneficial use, ownership or control within the hydrologic boundary of the Delaware River Basin.

#### § 440.3 High volume hydraulic fracturing (HVHF)

(a) **Determination.** The Commission has determined that high volume hydraulic fracturing poses significant, immediate and long-term risks to the development, conservation, utilization, management, and preservation of the water resources of the Delaware River Basin and to Special Protection Waters of the basin, considered by the Commission to have exceptionally high scenic, recreational, ecological, and/or water supply values. Controlling future pollution by prohibiting such activity in the basin is required to effectuate the comprehensive plan, avoid injury to the waters of the basin as contemplated by the comprehensive plan and protect the public health and preserve the waters of the basin for uses in accordance with the comprehensive plan.

(b) **Prohibition.** High volume hydraulic fracturing in hydrocarbon bearing rock formations is prohibited within the Delaware River Basin.

#### § 440.4 Exportation of water for hydraulic fracturing

As set forth in section 2.30 of the Delaware River Basin Water Code (“Water Code”) (incorporated by reference at part 410 of this chapter), it is the policy of the Commission to discourage the exportation of water from the Delaware River Basin. Accordingly, the diversion, transfer or exportation of water from sources within the basin to support hydraulic fracturing outside the basin is discouraged. The transfer of surface water, groundwater, treated wastewater or mine drainage water, at any rate or volume, for utilization in hydraulic fracturing of hydrocarbon bearing rock formations outside the basin requires Commission approval in the form of a docket and shall be subject to the evaluation described by section 2.30.4 of the Water Code.

#### § 440.5 Produced water.

(a) **Related Commission policies.** (1) It is the policy of the Commission to discourage the importation of wastewater into the basin (see section 2.30.2 of the Delaware River Basin Water Code, incorporated by reference at part 410 of this chapter).

(2) It is the policy of the Commission to give no credit toward meeting wastewater treatment requirements for wastewater imported into the Basin (see section 2.30.6 of the Delaware River Basin Water Code incorporated by reference at part 410 of this chapter).

(3) The Commission has determined by Resolution No. 2000–4 that allocations of the waste assimilative capacity of the Delaware River Estuary are necessary to maintain stream quality objectives for acute toxicity and chronic toxicity in Water Quality Zones 2, 3, 4 and 5 and for 1,2 dichloroethane and tetrachloroethene in Water Quality Zones 2 and 3.

(4) It is the policy of the Commission that there be no measurable change in existing water quality except towards natural conditions in waters considered by the Commission to have exceptionally high scenic, recreational, ecological, and/or water supply values. Waters with exceptional values may be classified by the Commission as either Outstanding Basin Waters or Significant Resource Waters. (See section 3.10.3.2 of the Delaware River Basin Water Code, incorporated by reference at part 410 of this chapter).

(5) Effluents shall not create a menace to public health or safety at the point of discharge. (See section 3.10.4 of the Delaware River Basin Water Code, incorporated by reference at part 410 of this chapter).

(6) The underground water resources of the Basin shall be used, conserved, developed, managed, and controlled in view of the needs of present and future generations, and in view of the resources available to them. To that end, interference, impairment, penetration, or artificial recharge shall be subject to review and evaluation under the Compact. (See section 2.20.6 of the Delaware River Basin Water Code, incorporated by reference at part 410 of this chapter).

(b) **Approval required.** Produced water and CWT wastewater as defined in this part may not be imported into the Basin except by a new or existing wastewater treatment facility located within the Basin, and may not be transferred to, treated by or discharged from or to a new or existing wastewater treatment facility located within the Basin, at any volume or rate, except in accordance with an approval in the form

of a docket issued by the Commission to the owner or operator of the wastewater treatment facility pursuant to section 3.8 of the Compact or in accordance with a state permit issued pursuant to a duly adopted administrative agreement between the Commission and the host state.

(c) *Alternatives and impact assessment.* Any project involving the importation of produced water or CWT wastewater into the Basin shall be subject to the requirement that alternatives involving no importation must be analyzed and the water resource, economic and social impacts of the project evaluated, as described in section 2.30.4 of the Commission's Water Code.

(d) *Compliance with existing rules.* In addition to the requirements in this part, all discharges within the Basin of produced water and CWT wastewater as defined in this part must comply with applicable DRBC Water Quality Regulations (incorporated by reference at part 410 of this chapter), state regulations and federal regulations. If a conflict exists among the applicable regulations, the more stringent requirement shall apply to these discharges.

(e) *Treatment facilities.* (1) Produced water as defined in this part:

(i) May not be treated within the Basin except at a centralized waste treatment facility (CWT) as that term is defined by the U.S. Environmental Protection Agency in 40 CFR part 437 (to convert it to CWT wastewater); and pursuant to an approval issued in accordance with § 440.5(b).

(ii) May not be discharged within the basin without treatment at a CWT.

(2) CWT wastewater as defined in this part may be discharged only:

(i) Directly by the CWT pursuant to an approval issued in accordance with section 440.5(b); or

(ii) Indirectly by a CWT to a wastewater treatment facility within the Basin (via sewer, truck or other means) pursuant to an approval issued in accordance with § 440.5(b).

(iii) Provided that the discharge meets the requirements of § 440.5(f) through (h).

(f) *Treatability studies.* The Commission shall not issue any required docket or approval for the treatment of produced water or the discharge of CWT wastewater unless the project sponsor has identified each proposed source of the produced water or CWT wastewater and has submitted to the Commission a treatability study (or studies) prepared by a professional engineer licensed in the state(s) in which the treatment and discharge

facilities are located, demonstrating that:

(1) An analysis, characterization and quantification of all pollutants of concern, as that term is defined in § 440.2, has been conducted and the results submitted to the Commission;

(2) The acute and chronic toxicity of the waste, measured as Whole Effluent Toxicity (WET), have been evaluated;

(3) The treatment technologies and applicable design criteria to be used to meet all requirements of § 440.5(g) have been identified;

(4) The produced water (or CWT wastewater) will not pass through or interfere with the facility's treatment process, and the resulting effluent will meet all applicable limits;

(5) The classification, treatment and disposal of residuals from the facility, if any, will not be adversely affected; and

(6) The discharge will not cause or contribute to an exceedance of applicable water quality criteria or stream quality objectives or impair the existing or protected use of the receiving water.

(g) *Additional effluent requirements.* Except as provided in paragraph (h) of this section, the following requirements shall apply within the Basin to effluent resulting from the treatment of produced water or CWT wastewater. In any instance in which these requirements are deemed to conflict, the more stringent shall apply:

(1) For total dissolved solids (TDS):

(i) The effluent shall not exceed background or 500 mg/l, whichever is less.

(ii) Provided, however, that in waters that drain to Delaware River Water Quality Zones 4 through 6, the resulting effluent shall not exceed 1,000 mg/l, or a concentration established by the Commission that is compatible with designated water uses and stream quality objectives.

(iii) The Commission will publish guidance on acceptable methods for determining background TDS concentrations.

(2) For waters for which the protected or designated uses include "public water supplies" or "drinking water", the effluent shall not exceed the more stringent of EPA's or the host state's

(i) Primary drinking water standards for inorganic chemicals, organic chemicals (excluding acrylamide and epichlorohydrin) and disinfection byproducts; and

(ii) Secondary drinking water standards (excluding color, corrosivity, and odor).

(3) For whole effluent toxicity (WET), the effluent shall not exceed: 0.3 toxic

units (acute) and 1.0 toxic units (chronic).

(4) For pollutants of concern as defined in section 440.2 of this part:

(i) For waters that drain to Special Protection Waters, the effluent shall not exceed the background concentration of each pollutant in the receiving water.

(ii) For waters that do not drain to Special Protection Waters:

(A) If pollutant-specific numeric water quality criteria exist, the effluent concentration for the pollutant shall not exceed the numeric criteria.

(B) If pollutant-specific numeric water quality criteria do not exist, the effluent shall not exceed the background concentration of the pollutant in the receiving water or cause an exceedance or violation of any existing narrative criteria.

(C) The Commission will publish guidance on acceptable methods for determining background concentrations for pollutants of concern.

(5) The Commission may require the discharger to perform such monitoring and reporting as the Commission deems necessary to ensure compliance with established numeric effluent limits and to support the development of additional numeric limits if needed.

(h) *Point of compliance.* (1) The effluent limitations are to be met at the point of discharge to basin waters.

(2) To ensure that all conditions, requirements and standards under this rule are met, the Commission may impose additional monitoring requirements or other conditions on any CWT within the basin that discharges CWT wastewater as defined in this part to another wastewater treatment facility in the basin.

(3) A mixing zone may be considered for any pollutant for which a mixing zone is permitted in the Delaware River Estuary by the DRBC Water Quality Regulations (incorporated by reference at part 410 of this chapter).

Dated: January 5, 2018.

**Pamela M. Bush,**

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[FR Doc. 2018-00344 Filed 1-11-18; 8:45 am]

**BILLING CODE 6360-01-P**