

I. INTRODUCTION AND BACKGROUND

Pursuant to Rule 213 of the Federal Energy Regulatory Commission's (Commission) Rules of Practice and Procedure, 18 C.F.R. §385.213, the Susquehanna River Basin Commission (SRBC) submits this Protest and Answer to the Petition for Declaratory Order filed by Exelon Generation Company, LLC on February 28, 2019.

The SRBC is a federal-state compact agency, comprised of the United States, New York, Pennsylvania and Maryland. Our agency is charged with the "planning, conservation, utilization, development, management, and control of the water resources of the Susquehanna River Basin..." and the SRBC was created to "provide for the joint exercise of these powers of sovereignty in the common interests of the people of the region." SRBC Compact, § 1.3, Pub. Law 91-575, 84 Stat. 1509 *et seq.* The Conowingo Hydroelectric Project (Project) is located within the Susquehanna River Basin. The SRBC and the Federal Power Commission (the predecessor in interest to the Commission) have a Memorandum of Understanding dated November 5, 1976 outlining how they will exercise their concurrent jurisdiction over projects.¹

The SRBC has been an active participant regarding the relicensing of this Project both before the Commission through the Integrated Licensing Process and before the Maryland Department of Environment's (MDE or Maryland) 401 Water Quality Certification Process. As the agency charged with the health, vitality and well-being of the Susquehanna River, the SRBC has a unique perspective and interest in the Project and its impacts both upstream and downstream.

¹ Susquehanna Power Co., 19 F.E.R.C. P61,348; 1980 FERC LEXIS 112 at *1, n.1 (Aug. 14, 1980) ("The Commission and SRBC executed a memorandum of understanding on November 5, 1975 [sic] providing cooperative procedures for processing license applications under Part I of the Federal Power Act and committing themselves to give due regard to the recommendations of each other.").

II. MARYLAND HAS NOT WAIVED ITS RIGHT TO ISSUE A SECTION 401 CERTIFICATION

A. Exelon's Reading of Hoopa Valley is Overbroad

Exelon relies on the recently decided Hoopa Valley Tribe v. FERC, 913 F.3d 1099 (D.C. Cir. 2019) to advance an argument that Maryland has waived its 401 certification, simply because Exelon withdrew and resubmitted its 401 Water Quality Application to allow a necessary multi-year study for sediment to be completed. The SRBC joins in Maryland's Protest and Answer flatly rejecting Exelon's assertion of waiver. However, it is worth noting that Exelon's reading of Hoopa Valley is overbroad and contrary to the Court's signals within the opinion itself. There are key differences between the arrangement at issue in Hoopa Valley and the review of Exelon's 401 Water Quality Certification.

1. The length of time was a factor.

In Hoopa Valley, it is inescapable that the sheer length of time mattered in the Court's analysis of this case. The Court noted:

PacifiCorp first filed its requests with the California Water Resources Control Board and the Oregon Department of Environmental Quality in 2006. Now, *more than a decade later*, the states still have not rendered certification decisions. FERC "sympathizes" with Hoopa, noting that the lengthy delay is "regrettable." According to FERC, it is now commonplace for states to use Section 401 to hold federal licensing hostage. At the time of briefing, twenty-seven of the forty-three licensing applications before FERC were awaiting a state's water quality certification, and four of those had been pending for *more than a decade*.

Id. at 1104 (emphasis in original).² The Court's own placement of emphasis and reiteration of the "more than a decade" language is a telling factual driver of its decision.

²Also, notable in this passage is the Court's characterization of FERC's attitude toward the States' exercise of its 401 Water Quality Certification as an exercise in hostage-taking. In this case, it cannot be said that the Commission's licensing process was held hostage by Maryland's 401 Water Quality Certification because just one month prior to Maryland's issuance of the 401 Certification, the Commission was still seeking the concurrence of a biological opinion on

The Court further emphasized the length of time later in its opinion. “Indeed, as agreed, before each calendar year had passed, Pacific Corp sent a letter indicating withdrawal of its water quality certification request and resubmission of the very same . . . *in the same one-page letter . . . for more than a decade.*” Id. (emphasis in original). “The record indicates that PacifiCorp’s water quality certification request has been complete and ready for review for more than a decade.” Id. at 1105.

In contrast to dragging on for more than a decade, Maryland timely issued a 401 Water Quality Certification once Exelon finished the multi-year sediment study required for a technically complete certification application. See Exelon’s Petition at p. 1. This highlights a more fundamental difference between Maryland’s actions and those at issue in Hoopa Valley; namely, the State took action in a timely fashion and in accordance with FERC rules.

2. Maryland did not sit idle.

Maryland’s 401 Water Quality Certification process was vigorous, robust, collaborative with other resource agencies, and active. None of that could be said for the States’ review in Hoopa Valley, which highlights the major substantive difference in this case and why Hoopa Valley is distinguishable.

In Hoopa Valley, California and Oregon entered into a settlement agreement that created a contractual idleness that effectively acted as a scheme to circumvent the Clean Water Act’s limitations. The Court explained that the settlement agreement provided for the States to “defer the one-year statutory limit for Section 401 approval by annually withdrawing-and-resubmitting the water quality certification requests...[and] explicitly required abeyance of all state permitting reviews...” Id. at 1101. Each year, the applicant filed an identical water quality certification

the Project’s effect on Atlantic Sturgeon from the National Marine Fisheries Service under the Endangered Species Act. See FERC Submittal 20180404-3032, Letter from J. Smith, FERC to M. Pentony, National Marine Fisheries Service (April 4, 2018).

application “in the same one-page letter....” Id. at 1104. The Court held that the States failed and refused to act under the Clean Water Act through their “deliberate and contractual idleness.” Id. The Court even went so far as to characterize the whole exercise as a “scheme.”

Maryland, in contrast, was actively engaged with Exelon on what was needed for its 401 Water Quality Certification application. Early in the Commission’s Integrated Licensing Process, Maryland and other stakeholders identified sediments behind the dam as a legitimate environmental concern. This prompted Maryland to require Exelon to supplement its 401 Water Quality Certification application with a “multi-year sediment study”³ to address these concerns.⁴ Because “the Sediment Study would not be completed prior to January 31, 2015, Exelon withdrew its application for a water quality certification...” and resubmitted its application on March 3, 2015. Id.

Unlike the applicant in Hoopa Valley who resubmitted the same application with the same one page letter, Exelon resubmitted with unique letters highlighting additional information submitted to Maryland for its review in the 401 water quality certification process. With its April 26, 2016 submission, Exelon noted that:

The application consists of the materials submitted previously to MDE on March 3, 2015, as supplemented by the Sediment Study referenced above. In addition, Exelon recently reached an agreement with the U.S. Department of Interior

³ FERC Submittal 20150304-5096, Exelon Resubmission of its 401 Water Quality Certification Application to MDE, March 3, 2015.

⁴ In its Petition, Exelon highlights FERC’s pre-application study process and Maryland’s participation in it to characterize Maryland’s requested sediment study as “unnecessary.” See Petition at p. 4-6. Exelon seems to suggest that, if the Commission rejects a study that the State deems is needed for it to complete its 401 Water Quality Certification, then that study is unnecessary. This would run counter to the Supreme Court’s view of the Clean Water Act as the paragon of “cooperative federalism,” which respects the sovereignty of both the federal government and the states that make up the Union. See Arkansas v. Oklahoma, 503 U.S. 91, 101 (1992) (“The Clean Water Act anticipates a partnership between the states and federal government, animated by a shared objective.”). In short, despite Exelon’s protestations, Maryland has the sovereign right to ask for all necessary information for a technically complete 401 certification application, whether or not the Commission agrees.

(“Interior”) relating to fish passage at the Conowingo Project. Exelon has included a copy of the Settlement Agreement, which also contain Interior’s modified prescription for fishways at the Conowingo Project....⁵

When the multi-year sediment study was completed, Exelon filed its final resubmission of its *complete* 401 water quality certification on “six compact discs.”⁶ In addition to the Sediment Study, this resubmission contained even more additional supplemental information for review, including “additional eel passage commitments [that] are described more fully in the Supplemental Filing...included in the Application.”⁷

Maryland used this supplemental information to craft findings and conditions regarding sediment, dissolved oxygen, minimum flows, fish passage (including eels) and many other items addressing Maryland’s water quality standards.⁸ This is a proper and appropriate use of a State’s authority under Section 401 of the Clean Water Act. Maryland acted diligently and appropriately to work with Exelon to provide a complete application that addressed all of Maryland’s water quality standards and acted expeditiously to meet the one year limitation in the Clean Water Act once *all required supplemental information was provided by the Applicant to make a complete application for water quality certification*. This fact alone distinguishes this case from Hoopa Valley and dictates a different result.

⁵ FERC Submittal 201604026-5207, Exelon Resubmission of its 401 Water Quality Certification Application to MDE, April 26, 2016.

⁶ FERC Submittal 201705017-5130, Exelon Resubmission of its 401 Water Quality Certification Application to MDE, May 17, 2017.

⁷ *Id.* See also FERC Submittal 20170421-5232, Exelon Filing of Supplemental Information to FERC, April 21, 2017 (It is our understanding that MDE will review the eel passage facility requirements as part of its review of the application for a water quality certification for Conowingo.”).

⁸ FERC Submittal 20180508-5125, Water Quality Certification of Maryland, May 8, 2018.

B. Exelon's Use of Hoopa Valley to Absolve Itself of Commitments That It Has Made Is Inappropriate and Untimely.

There is something disquieting about Exelon's use of Hoopa Valley to aggressively undo the commitments that it has made throughout this process. The record is bereft of any protest that Exelon has made to Maryland's approach in this 401 Certification process until its February 28, 2019 petition. Exelon willingly conducted the sediment study and cooperated on supplementing its submittal to Maryland beyond even the sediment study. Many stakeholders, including the SRBC, have relied on this process and expended considerable time and resources to assist Maryland in this important process. To now collaterally attack the process, through an aggressive reading of a case that was decided after Maryland actually issued its 401 Certification is specious and shows a lack of regard for the process, for the stakeholders who participated in good faith and ultimately for the wellbeing of the Susquehanna River.

Measured by Exelon's Petition, it had four years to Petition the Commission for a decision that Maryland waived its 401 Water Quality Certification. To do so now, is inappropriate. Further, even assuming that Exelon's reading of Hoopa Valley was not overbroad, it would be inappropriate for the Commission to rely on case law decided after Maryland has already issued its 401 Certification to declare that it is now waived. The only thing that should be waived is Exelon's ability to only now make this argument after it has seen Maryland's 401 Certification conditions and deemed them to be objectionable.

III. THE PROVISIONS OF THE 401 CERTIFICATION, INCLUDING MINIMUM FLOWS, SHOULD BE INCLUDED IN ANY FERC LICENSE.

In its Petition, Exelon asks the Commission to reject Maryland’s 401 Water Quality Certification “as a whole” and to not incorporate any provisions into the FERC license. Should the Commission find that the 401 Water Quality Certification is waived, it should nevertheless incorporate these conditions into the FERC license, especially the conditions that were not appealed by Exelon. Because of its involvement and expertise in helping to develop appropriate minimum flows needed below the Conowingo Dam, the SRBC will focus on that issue.

Maryland’s water quality certification provides significant findings that the Commission would be wise not to ignore. Maryland found:

When initially constructed and for many decades of its initial operation, the Project had no provision for fish to move upstream and did not maintain any minimum level of water flowing downstream. Fish kills occurred downstream and the quantity and quality of suitable habitat for riverine species in the River was adversely impacted. ...

As currently operated, the Project’s peaking flow regime, characterized by drastic daily changes in water depth below the Dam and velocities of discharge over a period of one hour, continues to cause fish kills downstream by stranding fish in shallow pools with insufficient water and subjecting them to increased threat of predation. The flow regime also delays upstream movement of important migratory spawning species such as Shad and Herring, and adversely impacts downstream habitat and the integrity of the downstream aquatic system. ...

... The River should support tens of millions of freshwater mussels; today, the freshwater mussel population is significantly diminished above and below the Dam such that it is considered unviable.⁹

As a result of these findings, Maryland fashioned an appropriate flow regime. The first 10 years matched Exelon’s proposed flow regime and then significantly, for the protection of the downstream aquatic resources, the certification imposes a Year 10 Flow Regime starting on

⁹ FERC Submittal 20180508-5125, Water Quality Certification of Maryland at p. 11-12, May 8, 2018.

January 1, 2029. The 10 year flow regime provides more robust minimum flows as well as down-ramping and up-ramping rates to decrease adverse impacts to the aquatic system, which would include:

[S]tatistically significant improvement in (a) the percentage of Shad and Herring moving from the Tailrace and being captured in fishlifts within three days of their entrance into the Tailrace; (b) the quality of downstream aquatic life as evidenced by reduction in the number of fish strandings; (c) the quality and abundance of the macroinvertebrate community and freshwater mussel community; and (d) the abundance of SAV [submerged aquatic vegetation] within the segment of the River between the project and the head of tide.¹⁰

A review of its filings challenging Maryland’s decision that have been filed with the Commission reveal that Exelon has not appealed the minimum flow provisions.¹¹ In its November 8, 2018 filing with the Commission, Exelon listed its four substantive objections to the 401 Water Quality Certification, namely: 1) the nutrient conditions (related to sediment); 2) the trash and debris conditions; 3) the invasive species conditions; and 4) any fish passage condition that exceeds the Department of Interior’s requirements.¹²

Indeed, pertaining to water flow, Exelon has stated in its filings: “To be sure, Maryland legitimately can ensure that the Project’s restrictions on *water flow* do not impair applicable water quality standards. *See S.D. Warren Co. v. Me. Bd. of Env’tl Protection*, 547 U.S. 370 (2006).”¹³ Exelon’s attorney has even admitted the propriety of the minimum flow conditions in an October 19, 2018 proceeding before Maryland:

¹⁰ *Id.* at p. 14 and Attachments 4 and 5.

¹¹ FERC Submittal 20180525-5191, Exelon Filing of 401 Water Quality Certification Appeals with FERC (May 25, 2018).

¹² FERC Submittal 20181108-5144, Exelon Lodging of Filings Before the Maryland Department of the Environment and Maryland Courts (November 8, 2018) (cited text is from “Supplement to Exelon’s Protective Petition for Reconsideration and Administrative Appeal” at p. 3).

¹³ FERC Submittal 20180525-5191, Exelon Filing of 401 Water Quality Certification Appeals with FERC (May 25, 2018) (emphasis in original) (cited text is from Exelon’s “Protective Petition for Reconsideration and Administrative Appeal” at p. 4).

There's no question about that, and that's why historically, 401 conditions related to dams have focused on two principal things. One is water flow. Obviously, the most fundamental thing a dam does is it changes the flow of the river. Typically slows that flow down. That impact on water flow has an effect on various aspects of water quality, and the Supreme Court of the United States has made clear because of those impacts on water flow, a state can regulate under 401, and we did not in our petition for reconsideration challenge the restrictions that MDE imposed on water flow even though they're different from the conditions that FERC had imposed.¹⁴

Interestingly, despite this on-the-record admission just four months ago, Exelon now urges the Commission to “reject the April 2018 Document’s requirement to change in 2029 to the ‘Year 10 Flow Regime’ or the ‘Modified Year 10 Flow Regime.’”¹⁵ Exelon argues that there is no basis in the record before the Commission for transitioning to a more-restrictive flow regime at that particular time.”¹⁶

Of course, there has been substantial information placed in the record that supports the Year 10 Flow Regime adopted by Maryland in its 401 Water Quality Certification, submitted by the SRBC and The Nature Conservancy (TNC), for example. The SRBC provided comments and recommendations on instream flows to the Commission on April 20, 2015, clearly stating that “SRBC does not agree that the [FERC] staff alternative related to flow management strikes an appropriate balance between power generation and instream flow protection.”¹⁷ TNC also supplied

¹⁴ FERC Submittal 20181108-5144, Exelon Lodging of Filings Before the Maryland Department of the Environment and Maryland Courts (November 8, 2018) (cited text is from the transcript of an October 19, 2018 meeting at the Office of the Maryland Attorney General at p. 45-46).

¹⁵ Exelon’s Petition at P. 46.

¹⁶ Id.

¹⁷ FERC Submittal 20150420-5208, Susquehanna River Basin Commission Comments on FERC Final Multi-Project EIS under P-405-106 at p. 3 (April 20, 2015).

comprehensive recommendations on the instream flow to the Commission, which clearly support the recommendations made by Maryland.¹⁸

Similar information supporting the instream flow recommendations contained in the Year 10 Flow Regime was provided directly to Maryland Department of the Environment as a part of their review of Exelon's 401 Water Quality Certification Application.¹⁹ These letters are included with this filing as Exhibit A and Exhibit B. Particularly relevant are SRBC's conclusions, shared with Maryland and mostly incorporated into their 401 Water Quality Certification:

1. For the benefit of downstream aquatic habitat, water quality, water availability, and freshwater inflows to the Bay, SRBC recommends employing a two tiered monthly minimum flow requirement predicated on inflow conditions measured at the USGS Susquehanna River at Marietta, Pennsylvania stream gage:

i. The required minimum flows for above normal flow conditions (greater than monthly 50th percent exceedance flow) in March through November should be based on monthly 75th percent exceedance flows. For December, January, and February, the required minimum flows should be based on the monthly 92nd percent exceedance flows.

ii. For below normal streamflow conditions (less than monthly 50th percent exceedance flow) required minimum flows should be based on monthly 92nd percent exceedance flows. For December, January and February, the required minimum flows should be the minimum of inflow or the monthly 92nd percent exceedance flow.

2. SRBC recommends seasonal maximum ramping rate requirements to improve persistent habitat for target species downstream and to avoid stranding and mortality of a variety of aquatic organisms, as well as to improve fish passage. Again as outlined in the attached flow proposal, for October through June, the

¹⁸ See, e.g., FERC Submittal 20150416-5198, Comment of The Nature Conservancy under P-405-106 (April 16, 2015); FERC Submittal 20150206-5219, Supplemental DEIS Comment of The Nature Conservancy (April 16, 2015); FERC Submittal 20140131-5199, Motion to Intervene, Recommended Alternatives, and Preliminary Terms and Conditions of The Nature Conservancy (January 31, 2014).

¹⁹ Letter to Elder Ghigiarelli, Jr., Maryland MDE from SRBC (August 23, 2017) (Exhibit A); Letter to Elder Ghigiarelli, Jr., Maryland MDE from TNC (August 23, 2017) (Exhibit B). Only the text of the TNC letter is included at Exhibit B because the attachments to that letter were copies of TNC's submissions to the Commission outlined, *supra*, n. 17.

maximum down ramping rate should be set at 20,000 cubic feet per second / hour (cfs/hr). For July through September, the maximum down ramping rate should be governed by two triggers using the Marietta gage, with measured flows less than 30,000 cfs and less than 86,000 cfs setting the rate at 10,000 cfs/hr and 20,000 cfs/hr, respectively.

Exelon asks the Commission to casually throw these minimum flow operations, which are well-supported by science and evidence in the record before Maryland and the Commission, out of the FERC license. This is especially troubling, when as recently as October 2018, Exelon did not find them sufficiently objectionable to even bother appealing them alongside all other major conditions of the certification.

The SRBC respectfully requests that the Commission decline Exelon's unsupported solicitation to throw away sensible minimum flow conditions based upon sound science and interagency collaboration and cooperation.

IV. CONCLUSION

For the foregoing reasons, the SRBC requests that the Commission reject Exelon's Petition for Declaratory Order and DISMISS it in its entirety. In the alternative, the SRBC requests that the Commission adopt the recommendations and conditions contained in Maryland's 401 Water Quality Certification as part of its final license, especially the conditions related to minimum flows and the Year 10 Flow Regime.

Respectfully submitted,

/s/ Jason E. Oyler
Jason E. Oyler
General Counsel
Susquehanna River Basin Commission

Dated: March 28, 2019

CERTIFICATE OF SERVICE

I hereby certify that I have this 28th day of March, 2019, caused the foregoing document to be served upon each person designated on the office service list compiled by the Commission in this proceeding.

/s/ Jason E. Oyler
Jason E. Oyler



SUSQUEHANNA RIVER
BASIN COMMISSION

NY • PA • MD • USA

August 23, 2017

Mr. Elder Ghigiarelli, Jr.
Deputy Program Administrator
Wetlands and Waterways Program
Water Management Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 430
Baltimore, MD 21230

Re: Section 401 Water Quality Certification Application
Conowingo Hydroelectric Project (FERC Project No. 405)

Dear Mr. Ghigiarelli:

The Susquehanna River Basin Commission (SRBC) appreciates the opportunity to provide comments as part of Maryland Department of the Environment's (MDE) process regarding the Proposed Conowingo Hydroelectric Project Water Quality Certification Application under the Clean Water Act.

Concurrent with FERC's jurisdiction, SRBC regulates hydroelectric projects pursuant to Article 3, Section 3.10, and Article 10, Section 10.1, of the Susquehanna River Basin Compact, P.L. 91-575, 84 Stat. 1509 et seq., and SRBC Regulations 18 CFR Parts 801, 806, 807, and 808. SRBC authorizes hydroelectric projects in accordance with the "Comprehensive Plan for the Water Resources of the Susquehanna River Basin" (Comprehensive Plan), dated December 2013, and as mandated by Article 14 of the Susquehanna River Basin Compact.

GENERAL COMMENTS

Operation of the Conowingo Hydroelectric Project results in significant hydrologic alteration to the lower Susquehanna River and upper Chesapeake Bay. As such, SRBC has a strong interest with its management considering the operations have the ability to strip any benefits related to upstream management actions implemented by either SRBC or its member jurisdiction agencies, including the state of Maryland. Additionally, SRBC is not convinced the Final Environmental Impact Statement meets the water quality components of our own Comprehensive Plan, and that flow considerations outlined in our following comments are a significant component in rectifying that shortfall.

COMMENTS REGARDING INSTREAM FLOWS

- The existing Conowingo Hydroelectric Project intra-daily peaking operations create a severely altered flow regime in which conditions routinely fluctuate rapidly between drought (minimum flow) and flood (generation flow) conditions in a single day.
- Rapidly fluctuating flow conditions resulting from Conowingo Hydroelectric Project operations significantly impact persistent suitable habitat, hydrologic cues of resident and migratory fishes, and stranding and mortality of various aquatic organisms.
- The existing minimum flow requirements for the Conowingo Hydroelectric Project range from as high as the monthly 85th percent exceedance flow (August) to as low as below record minimum flows (December through June) recorded at the United States Geologic Survey (USGS) Susquehanna River at Marietta, Pennsylvania stream gage. Furthermore, the existing minimum flow requirements for the months of December through February are intermittent, permitting a 6-hour on/off condition where no minimum streamflows are maintained downstream.
- While the flow regime proposed in the Conowingo Hydroelectric Project Water Quality Certification Application reflects an elimination of the intermittent minimum flow requirements for the months of December through February and an increase in minimum flows for most months, most notably for April and May, there are also decreases in minimum flows for August and the first half of September, which are critical low flow months when the aquatic ecosystem is most prone to stress during drought events.
- The percentage of maximum weighted usable area habitat for the proposed minimum flow regime cited in the Conowingo Hydroelectric Project Water Quality Certification Application reflects values less than 60 percent for several key target species and their life stages, including American shad, striped bass, and smallmouth bass. Furthermore, these data are not entirely applicable given Conowingo Hydroelectric Project peaking operations where conditions routinely fluctuate rapidly between drought (minimum flow) and flood (generation flow) conditions in a single day. In these settings, persistent habitat is a more suitable metric for assessing the impact of Conowingo Hydroelectric Project operations on target species.
- The SRBC's Low Flow Protection Policy is utilized to establish limitations or conditions on approvals issued by the Commission for withdrawals from streams or impoundments to ensure that any flow alteration related to such withdrawals does not cause significant adverse impacts to the downstream water resources, or to support a denial of any such application request where such standards cannot be met. For a water use project as significant as Conowingo Hydroelectric Project, and located on an impounded Aquatic Resource Class 6 mainstem river, the minimally protective standard for such withdrawals is the calculated monthly 95th percent exceedance conservation release. Conservation releases are intended to prevent water quality degradation and adverse lowering of streamflow levels downstream of the impoundment, thereby protecting aquatic resources

and other water uses. Because SRBC's Low Flow Protection Policy would typically allow no flow alteration below the monthly 95th percent exceedance flow, we are concerned that both the existing and proposed minimum flow requirements for the Conowingo Hydroelectric Project provide *less* than the 95th percent exceedance flow values below the dam for the months of October through July. It is important to note that SRBC would not likely issue an approval with similar conditions, which for a significant project such as the Conowingo Hydroelectric Project would be considered to provide less than the minimally protective downstream flow.

- Despite numerous agency and stakeholder comments submitted throughout the Federal Energy Regulatory Commission (FERC) relicensing process, none of the other agency/stakeholder-formulated flow management alternatives modeled by Exelon, which subsequently provided detailed hydrologic and habitat output data analyzed by the agency/stakeholder group, were considered and fully analyzed as complete action alternatives. Nonetheless, the Conowingo Hydroelectric Project Water Quality Certification Application states that the proposed minimum flow regime "adequately mitigates the impacts of the Project's regulation of flow in the lower Susquehanna River, and protects suitable habitats and key natural processes", despite the lack of a detailed examination of the environmental and financial benefits and trade-offs associated with a suite of operational alternatives and their specific components that is integral to striking a proper balance between the benefits of power generation and the economic and ecologic benefits of adequate instream flows in the lower Susquehanna River and upper Chesapeake Bay.
- In 2013, an agency/stakeholder group focused on flow management issues associated with FERC relicensing of Conowingo Hydroelectric Project submitted a flow management proposal intended to balance operational, economic and ecosystem needs, recognizing that the Conowingo Hydroelectric Project is an important electric generation asset and the lower Susquehanna River and upper Chesapeake Bay are irreplaceable ecological assets that also provide economic and social benefits. The flow management proposal was based on detailed analysis of hydrology, operations and habitat availability associated with the nine OASIS model runs the agency/stakeholder group submitted to Exelon in 2012. It also took into account settlement discussions between the agencies/stakeholders and Exelon. The proposal addressed three main flow management components, which include minimum flow, maximum up- and down-ramping rates, and maximum flow. The flow management proposal is attached herein.

CONCLUSION

Based on the unresolved comments presented above, SRBC respectfully submits the following considerations.

1. For the benefit of downstream aquatic habitat, water quality, water availability, and freshwater inflows to the Bay, SRBC recommends employing a two tiered monthly

minimum flow requirement predicated on inflow conditions measured at the USGS Susquehanna River at Marietta, Pennsylvania stream gage:

- i. The required minimum flows for above normal flow conditions (greater than monthly 50th percent exceedance flow) in March through November should be based on monthly 75th percent exceedance flows. For December, January, and February, the required minimum flows should be based on the monthly 92nd percent exceedance flows.
 - ii. For below normal streamflow conditions (less than monthly 50th percent exceedance flow) required minimum flows should be based on monthly 92nd percent exceedance flows. For December, January and February, the required minimum flows should be the minimum of inflow or the monthly 92nd percent exceedance flow.
2. SRBC recommends seasonal maximum ramping rate requirements to improve persistent habitat for target species downstream and to avoid stranding and mortality of a variety of aquatic organisms, as well as to improve fish passage. Again as outlined in the attached flow proposal, for October through June, the maximum down ramping rate should be set at 20,000 cubic feet per second / hour (cfs/hr). For July through September, the maximum down ramping rate should be governed by two triggers using the Marietta gage, with measured flows less than 30,000 cfs and less than 86,000 cfs setting the rate at 10,000 cfs/hr and 20,000 cfs/hr, respectively.

Again, SRBC appreciates the opportunity to provide these comments as part of MDE's water quality certification process. Should you have any questions regarding SRBC's review comments, please feel free to contact me at (717) 238-0423, extension 1221, or via e-mail at adehoff@srbc.net.

Sincerely,



Andrew D. Dehoff, P.E.
Executive Director

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August 23, 2017

Via electronic and first-class mail

Elder Ghigiarelli, Jr.
Deputy Program Administrator, Wetlands and Waterways Program
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Maryland Department of the Environment
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**Re: Application #17-WOC-02. Lower Susquehanna River and Upper Chesapeake Bay,
Use I & 2 Waters**

Dear Mr. Ghigiarelli,

The Water and Power Law Group PC submits these comments on behalf of The Nature Conservancy (the Conservancy) in response to the Maryland Department of the Environment's (MDE or Department) "Public Notice of the Proposed Relicensing of the Conowingo Hydroelectric Project Application for Water Quality Certification" (Notice) issued on July 10, 2017. We thank the Department for extending the comment deadline to August 23, 2017.

These comments are organized as follows: Section I describes the Conservancy's significant interests in ensuring that the Conowingo Project complies with applicable water quality standards for the lower Susquehanna River and Chesapeake Bay; Section II describes our concerns regarding the project's impacts on sediment and nutrient loads into Chesapeake Bay, and on designated uses for fish, aquatic life, and wildlife; Section III states our recommendations for further procedures on Exelon's application prior to hearing; and Section IV provides concluding remarks.

I. The Conservancy Is an Interested Party.

The Conservancy is a private, non-profit 501(c)3 organization with membership and operations throughout the Susquehanna River and Chesapeake Bay Watersheds and around the globe. The Conservancy's mission is to conserve the lands and waters on which all life depends. It is a science-based organization that works with partners to identify and implement solutions to complex conservation problems. It has over one million members world-wide.

As the United States' largest estuary, the Chesapeake Bay is an iconic feature that provides important ecological services along with employment, food, and recreation for millions of people. It also serves as a home for more than 3,600 species and is a crucial nursery for many fish and birds that migrate up and down the Atlantic coast and beyond. The health of the

Chesapeake is directly connected to the Susquehanna River, its largest tributary and the largest river on the East Coast of the United States. In addition to its ecological role, the Susquehanna River provides a critical source of drinking water to millions, unparalleled recreational opportunities, and power generation for the Mid-Atlantic region. Due to their enormous economic and ecological values, the Susquehanna River and the Chesapeake Bay are conservation priorities for the Conservancy.

Beyond restoration of these important places, the Conservancy is working globally to ensure a sustainable path to a low-carbon energy future. Our goals for the certification proceeding include the support of low-carbon electricity while: (1) restoring self-sustaining migratory fish populations by improving access to historic habitats above the Conowingo dam; (2) restoring habitat below the dam to restore populations of fish, mussels, turtles, submerged aquatic vegetation (SAV), and other aquatic life; and (3) improving water quality and sediment transport patterns in the Lower River and Upper Chesapeake Bay.

In addition to its organizational interests, the Conservancy represents individual members who use and enjoy the Susquehanna River and Chesapeake Bay for water supply, recreation, including fishing and boating, and their livelihoods.

The Conservancy, particularly its Pennsylvania and Maryland/DC Chapters and Chesapeake Bay Program, has interests that will be directly affected by the outcome of the Department's decision on Exelon Generation Corporation's (Exelon) application for Clean Water Act (CWA) section 401 certification for the Conowingo Project (Application #17-WQC-02). The Conservancy is also a party to the related hydropower relicensing before the Federal Energy Regulatory Commission (FERC).

II. Exelon's Application Does Not Yet Demonstrate that the Proposed Project Will Comply with Water Quality Standards.

The Conservancy agrees that the proposed protection, mitigation, and enhancement (PM&E) measures proposed in Exelon's Application for a Maryland Water Quality Certificate for the Conowingo Hydroelectric Project (hereafter, Application), will nominally enhance baseline conditions. However, we find the proposed measures are inadequate to mitigate the Conowingo Project's (Project's) known and significant effects on environmental resources in the lower Susquehanna River and Upper Chesapeake Bay.

The CWA and Maryland law require more than minimum protection. CWA section 101(a)¹ declares: "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

In furtherance of this goal, CWA section 401(a)(1), 33 U.S.C. §1341(a)(1), provides:

Any applicant for a Federal license or permit to conduct any activity . . . which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency

¹ 33 U.S.C. § 1251(a).

a certification from the State in which the discharge originates or will originate . . . that any such discharge will comply with the applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of this title.²

Thus, the certification must assure that the Conowingo Project will comply with state water quality standards for the term of any new FERC license.³ State water quality standards consist of designated uses, the water quality criteria necessary to protect such uses, and the anti-degradation standard.⁴ Thus, “a project that does not comply with a designated use of the water does not comply with the applicable water quality standards.”⁵

The certification must also assure compliance with the Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment (Chesapeake Bay TMDL), which was approved under CWA section 303(d).⁶ Under the Chesapeake Bay TMDL, MDE is required to demonstrate that it is making “sufficient progress” toward meeting the TMDL allocations through implementation of Watershed Implementation Plan (WIP) and other actions. If sufficient progress cannot be shown, MDE may be required to undertake additional actions to achieve the required nitrogen, phosphorus, and sediment load reductions that MDE has determined are necessary to protect designated beneficial uses.⁷

In the sections below, we describe why the Application does not provide a reasonable assurance of compliance with applicable state water quality standards, including the Chesapeake Bay TMDL. More detailed explanation is provided in the Attachments.

Of particular concern are the current and proposed design and operations as they affect the physical, chemical, and biological integrity of the Lower Susquehanna and Upper Chesapeake Bay. Specifically:

- **The unmitigated impact of reservoir design and releases to support designated uses** including: Growth and propagation of fish, other aquatic life and wildlife (year-round); Seasonal migratory fish spawning and nursery use (2/1-5/31); Seasonal Shallow-Water Submerged Aquatic Vegetation (4/1-10/30); and Open-water fish and shellfish (year-round); and
- **The unmitigated impact of reservoir storage and releases on the timing and quality of sediment and nutrient loads stored in the reservoir above the dam, which are released to the lower Susquehanna River and Upper Chesapeake Bay.**

² 33 U.S.C. § 1341(a)(1); *see also* Maryland ADC § 26.08.02.10.A(1).

³ *See id.* *See also* Maryland ADC §§ 26.08.02.01 (“To protect surface water quality, this State shall adopt water quality standards to: (1) Protect public health or welfare; (2) Enhance the quality of water; (3) Protect aquatic resources; and (4) Serve the purposes of the Federal Act.”), 26.08.02.02 (Designated Uses), 26.08.02.04 (Anti-Degradation Policy).

⁴ 33 U.S.C. § 1313(c)(2)(A); 40 C.F.R. §§ 131.10 – 131.12; *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 715 (1994).

⁵ *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. at 715.

⁶ 33 U.S.C. § 1313(d).

⁷ *See* Chesapeake Bay TMDL, pp. 7-11 – 7-12.

A. Impacts on the designated uses for fish, aquatic life, and wildlife

As stated above, the Conservancy is concerned that Exelon's Application does not accurately describe project impacts to designated uses of project waters, which include but are not limited to: Growth and Propagation of Fish (not trout), Other Aquatic Life and Wildlife; Leisure Activities Involving Fishing; Seasonal Migratory Fish Spawning and Nursery Use; and Seasonal Shallow-Water Submerged Aquatic Vegetation Use.⁸ It also does not propose PM&E measures that would mitigate impacts on these uses.

1. Migratory fish passage

Conowingo dam blocks 98% of historic migratory spawning habitat on the Susquehanna River for fish including American shad, river herring, and American eel.⁹ Efforts to pass migrating fish through the existing lifts have largely failed, with American shad passage remaining at less than 1 percent of population restoration goals (Figure 1). Regional stocks of native diadromous species remain relicts, well below sustainable thresholds.¹⁰ In addition to the ecological benefits of restoration, it is estimated that a restored stock of American shad on the Susquehanna River could produce 500,000 angler days valued at \$25 to \$37 million annually.¹¹

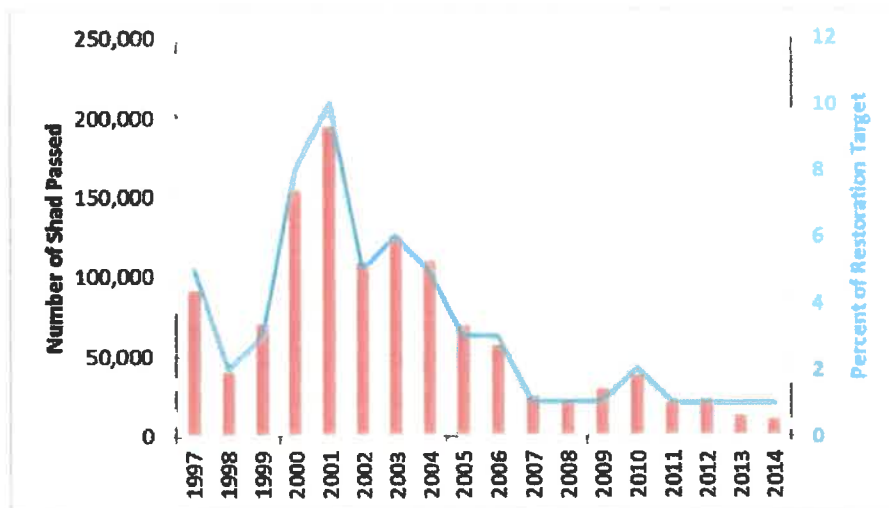


Figure 1. Annual number of shad passed at Conowingo dam as a percent of the SRAFRC restoration target.

⁸ Code of Maryland Regs. § 26.08.02.02.B(4).

⁹ Snyder, B. 2005. The Susquehanna River Fish Assemblage: Survey, Composition and Changes. *American Fisheries Society Symposium* 45:451-470.

¹⁰ Brown, J., K. Limburg, J. Waldman, K. Stephenson, E. Glenn, F. Juanes and A. Jordan. 2013. Fish and Hydropower on the U.S. Atlantic coast. *Conservation Letters* (2013):1-7.

¹¹ Susquehanna River Anadromous Fish Restoration Cooperative (SRAFRC). 2010. Migratory Fish Management and Restoration Plan for the Susquehanna River Basin. November 15, 2010.

As described in the Application (*see* pp. 36-38), Exelon made several commitments in the Conowingo Hydroelectric Project Settlement (April 21, 2016) (Fish Passage Agreement)¹² to improve migratory fish passage in an effort to operate in a manner that supports the fish passage goals established in Amendment 3 of the Interstate Fishery Management Plan and the 2010 SRAFRC Migratory Fish Management and Restoration Plan.

The Conservancy participated in the negotiations that led to the Fish Passage Agreement. To ensure reasonable protection of designated uses related to migratory fish and avoid inconsistent license requirements, the Conservancy requests that the Department incorporate the terms and conditions of the Fish Passage Agreement into their certification conditions as appropriate. We are particularly concerned that the Application omits the following three components of the Fish Passage Agreement that we believe are critical to restoring fish passage at the Project: (1) the inclusion of design criteria that reflect science-based goals to restore self-sustaining populations of shad, river herring and American eel to the Susquehanna River Basin; (2) the incorporation of performance-based standards for passage efficiency as opposed to technological standards to meet the design criteria; and (3) the inclusion of an adaptive management framework if performance standards are not met.

Although we participated in the negotiations, we declined to sign the Fish Passage Agreement for two reasons. First, we are concerned that the Agreement does not expressly limit use of trap-and-transport, at any point in the proposed 50-year license, in favor of increasing volitional passage. Second, we are concerned by the Agreement's definition and use of "adjusted passage efficiency" to trigger structural and operational investments. Specifically, under trap-and-transport, passage efficiency values are credited (or adjusted) at a greater rate than volitional passage. This adjustment is predicted to inflate passage efficiency values (to be greater than 100% under moderate population growth scenarios), which could result in a delay or complete deferral of operational and/or structural investments over the term of the license. These reasons are described in detail in Attachment 1.

We request that MDE address these outstanding issues and their implications on the protection of designated uses on the Susquehanna River and Upper Chesapeake Bay in its review of the Application and in the development of any certification conditions.

2. Migratory cues and fish stranding

Project operations adversely impact native diadromous fish populations by interrupting migratory cues, lengthening migration times, and stranding fish during ramping events.

The Application (*see* p. 22) states, "regardless of project discharge, tagged adult American shad migrated upstream to the Dam with little observable difficulty." We disagree with this conclusion. In our review of Revised Study Plan 3.5¹³ and related telemetry data, we

¹² eLibrary no. 20160512-5272 (May 12, 2016).

¹³ Normandeau Associates, Inc. 2011. Upstream Fish Passage Effectiveness Study RSP 3.5. Conowingo Hydroelectric Project. FERC Project Number 405. Prepared for Exelon Corporation.

found that after entering the tail race, it took American shad an average of 11 days to successfully enter the fish lift. Given typical swimming speeds, this distance should take only hours to migrate, and less than an hour at burst speeds. Peaking operations of up to 86,000 cfs create velocities at the fish lifts that exceed 6 ft./s and the maximum burst swim speeds of migratory fish. In addition, telemetry data revealed that fish enter the east fish lift disproportionately under certain operational scenarios. The operation of Unit 11 negatively impacts entry to the east fish lift, and successful entries were dominated by operating a combination of Units 2, 5, and 7.¹⁴ It has been demonstrated that delay of upstream migration associated with hydropower operations has been detrimental to the spawning and survival of diadromous fish.¹⁵

In addition to delaying migration, peaking operations at the Project cause fish stranding. Specifically, current operations allow the dam to change from peaking flows of 86,000 cfs to minimum flows (3,000 – 10,000 cfs), or by up to 9 feet, in an hour. The Application, states that “very low numbers of American shad, river herring and white perch were documented” (*see p. 22*), and goes on to conclude that while, “implementing an alternative flow regime could reduce this source of mortality, FERC concluded that the results of Exelon’s stranding surveys indicate that the magnitude of this benefit would be minor” (*id.* at p. 23).

Based on our review of the stranding studies, we strongly disagree and find that stranding impacts are significant on diadromous fish populations. Current project operations result in fish stranding and mortality in all months, both as a direct result of dewatering and indirectly from thermal stress and increased predation. During the 2011 spawning migration, it is estimated that 1,400 American shad and more than 500 river herring were stranded due to peaking operations (Attachment 2, Appendix 1: Table 4 and Figure 14). Further, total stranding is likely underestimated due to confounding factors of predation in isolated pools and issues of pool access during the FERC studies.¹⁶

We ask MDE to consider these outstanding issues and their implications to designated uses on the Susquehanna River in its review of the Application.

3. Downstream Aquatic Habitat

The Application proposes minimum flow conditions (*see pp. 34*). In our opinion, the weight of evidence in FERC’s administrative record shows these flows will not mitigate the impacts of the Project’s regulation of flow on resources of the lower Susquehanna River. For context, the proposed minimum flow releases would be lower than the historic minimum daily flows for most of the year and would be orders of magnitude lower than typical average flows

http://mde.maryland.gov/programs/water/WetlandsandWaterways/Documents/ExelonMD/WQCApplication0517_p1869-1969.pdf

¹⁴ Pugh, D. 2013. Independent review of American shad radio-telemetry data.

¹⁵ Casto-Santos and Letcher 2010.

¹⁶ Normandeau Associates, Inc. 2012. Final Study Report: Downstream Flow Ramping and Stranding Study RSP 3.8. Conowingo Hydroelectric Project. FERC Project No. 405:

<http://mde.maryland.gov/programs/water/WetlandsandWaterways/Documents/ExelonMD/FERC/Conowingo-FRSP-3.08.pdf>

throughout the year (Figure 2). More simply put, minimum flow releases would be lower than drought conditions for much of the year.

We strongly disagree with the Applicant's statement that this measure will, "adequately impact the Project's regulation of flow on the Susquehanna River, and protect suitable habitats and key natural processes (Application, p. 35)." The discussion below summarizes the basis for this disagreement, with a detailed report outlining ecological impacts of Project operations included in Attachment 2, Appendix 1.

First, we disagree with the scientific basis for the Application's findings on flow regime impacts. Exelon bases its findings of benefit on an invalid method to estimate aquatic habitat availability at a peaking facility (*see* Application p. 27, Table 1). The result is a gross overestimate of available habitat. Our scientific objections to this method and their related habitat estimates are corroborated by an attached expert testimony from Dr. Stalnaker (*see* Attachment 3) and other relevant filings (*see* Attachments 2 and 4). Dr. Stalnaker developed the Instream Flow Incremental Method and has played a key role in the development of instream flow science over the last 30 years. As explained by Dr. Stalnaker, the minimum flow approach and methods used by Exelon are based on science of the 1970's and 1980's. In his opinion, this approach is now regarded as "outdated and ecologically unsound."

Best available data, models, and literature in the record continue to show that existing and proposed project operations have significant adverse impacts on the quality and availability of habitat for native diadromous fish migration, spawning and rearing, including American shad, river herring (Federal Species of Concern), striped bass, Atlantic (Federally-listed Endangered) and shortnose sturgeon (Federally-listed Endangered); freshwater mussels; map turtles (State-listed Endangered); submerged aquatic vegetation; and macroinvertebrates (Attachments 2 and 4). As shown in Table 1 below, in most cases, the proposed operations will support less than 1/3 of maximum available persistent habitat for migratory fish spawning and rearing.

Figure 2. The Applicant's minimum flow alternative (dashed black line) proposes releases that would be lower than historic minimum flows (yellow line) for most of the year and orders of magnitude lower than median flows (brown line) year-round.

Natural Flow Variability: Susquehanna River at Conowingo*

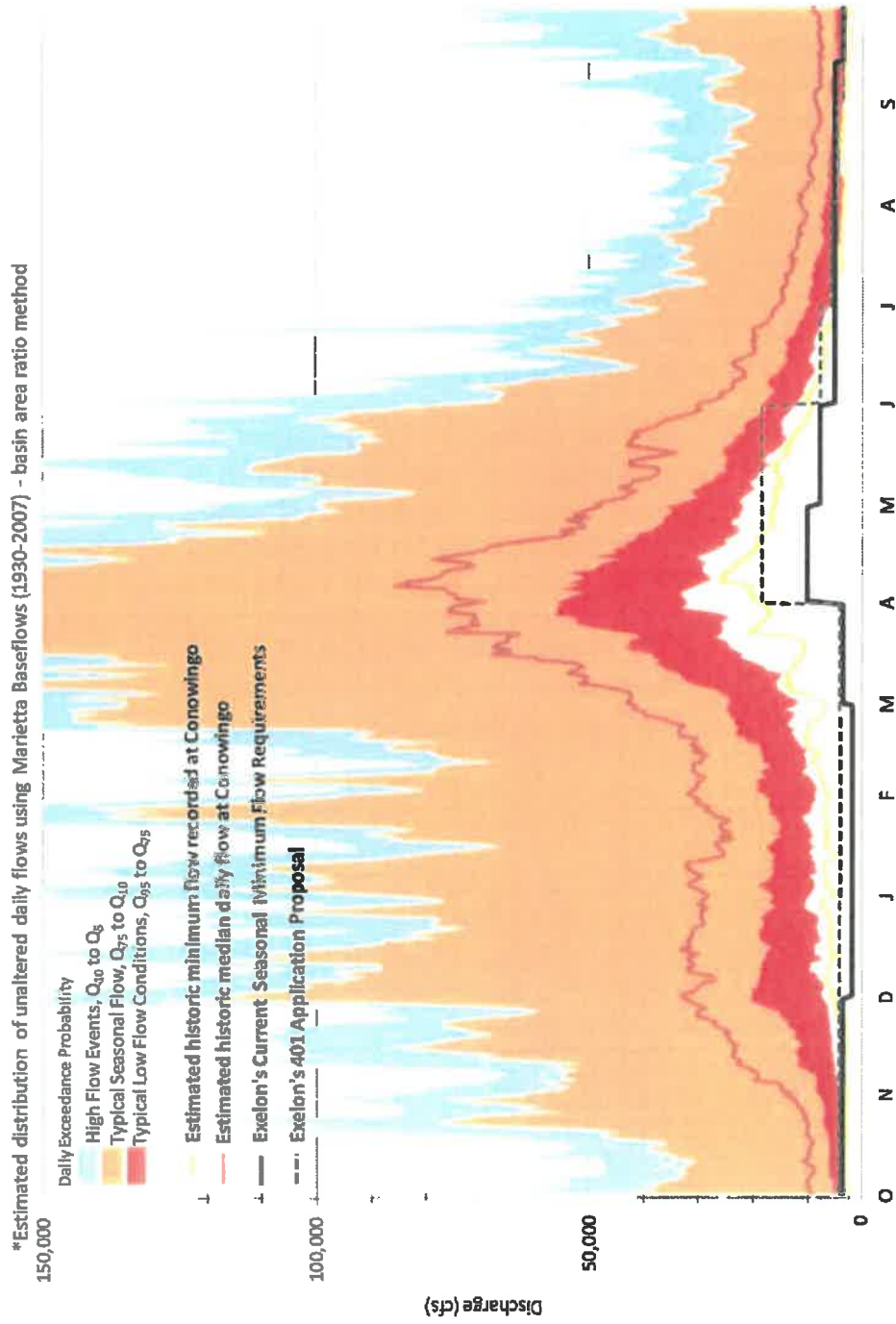


Table 1. Estimated percent of maximum available persistent habitat available for critical life stages with low mobility under proposed PM&E measures (Application pp. 34).

Target life stages	Percentage of Maximum Available Persistent Quality Habitat under Proposed Operations ¹⁷
American shad spawning	35 %
American shad fry	14 to 27 %
Striped bass spawning	33 %
Striped bass fry	3 to 24 %
Shortnose sturgeon spawning	50 %
Shortnose sturgeon fry	21 %
River herring spawning	4 to 5 %
Smallmouth bass spawning	2 %
Smallmouth bass fry	5 %
Trichoptera	5 to 9 %

The Conservancy, in consultation with resource agencies and other non-governmental organizations,¹⁸ developed ecological performance goals and a preferred operational alternative that supports the continued generation of low-cost, low carbon energy, while better balancing the ecological and ecosystem service values of the river (Attachment 2). This proposal was supported by multiple organizations and submitted by the U.S. Fish and Wildlife Service as part of its fish and wildlife recommendations under authority of Federal Power Act section 10(j).¹⁹

In summary, the Conservancy does not agree with the Application’s statement that Exelon’s proposed “flow condition adequately balance[s] both environmental and economic interests” (*see* Application, p. 7). The existing and proposed flow regime has, and is likely to continue to adversely affect submerged and emergent aquatic vegetation and the propagation of fish, shellfish and wildlife and aquatic habitat downstream on the Susquehanna River and Upper Bay downstream of Conowingo dam (*see* Attachment 2, Appendix 1: pp 6-13).

We ask MDE to address these outstanding issues and their implications on the protection of designated uses on the Susquehanna River and Upper Chesapeake Bay in its review of the Application and in the development of any certification conditions.

¹⁷ Estimated using minimum flows proposed in the Application, paired with maximum generation flows (86,000 cfs) and comparing to RSP 3.16 Appendix G, persistent habitat look up tables.

¹⁸ Susquehanna River Basin Commission, Maryland Department of Natural Resources, Maryland Department of the Environment, Pennsylvania Department of Environmental Protection, U.S. Fish and Wildlife Service, American Rivers.

¹⁹ 16 U.S.C. § 803(j).

4. Federal and State Listed T&E Species

Northern map turtle. As acknowledged in the Application (*see* p. 31), the Northern Map Turtle, listed as endangered in the state of Maryland, occurs in the Project boundary. The occurrences on the Susquehanna River below Conowingo dam are the largest remaining population in the state, with only a couple of additional occurrences being documented on local tributaries. The Application makes no statement of effect on the Northern Map Turtle, nor does it propose PM&E measures for their protection.

Project operations have been shown to adversely impact map turtle habitats important for reproduction, adult and juvenile growth and hibernation. Generation flows inundate basking habitats (*see* Attachment 2 – Appendix 1, Figures 3-4), which has reduced basking activity by an estimated 50 percent.²⁰ Basking is critical to juvenile and adult growth and reproductive development (rate and quality of egg-shelling).²¹ Conowingo’s peaking has also been shown to hinder short- and long term movements²² and proposed minimum flows during winter months are not sufficient to maintain suitable habitat conditions at key hibernacula (Attachment 2, App.1, Figure 20).

Shortnose and Atlantic sturgeon. The Application (*see* pp. 31-32) states that both species have historically occurred in the project area, but, “continued operation of the Project would not be likely to adversely affect either” (*id.*, p. 32). The Application and referenced Final Environmental Impact Statement (FEIS) provide no basis for its conclusion (*see* Attachment 4 (TNC’s comments on FEIS)). We disagree that continued operation of the Project as Exelon proposes would not be likely to adversely affect these species.

As outlined in the Final Recovery Plan for the Shortnose Sturgeon (*Acipenser brevirostrum*) (1998) (pp. 49-50), “in all but one of the northeast rivers supporting sturgeon populations..., the first dam on the river marks the upstream limit of the shortnose sturgeon population’s range. In all of these rivers, shortnose sturgeon spawning sites occur just below the dams, leaving all life stages vulnerable to perturbations of natural river conditions (e.g. volume, flow, velocity) caused by the dam’s operation.” The Conowingo dam on the Susquehanna River is not the exception.

As detailed in Table 1 above, proposed minimum flows are expected to provide less than 50% of maximum available spawning habitat for Shortnose sturgeon and less than 25% of available habitat for Shortnose sturgeon fry development. As Atlantic sturgeon use similar spawning habitat, effects are expected to be similar. Further, as sturgeon require gravels to

²⁰ Richards, T.M. and R.A. Seigel 2009. Habitat use of Northern Map Turtles (*Gratemys geographica*) in an altered system, the Susquehanna River, Maryland (USA). Presentation at the 2009 Ecological Society of America.; Richards-Dimitrie, T.M. 2011. Spatial ecology and diet of Maryland endangered northern Map Turtles (*Gratemys geographica*) in an altered river system: Implications for conservation and management. Graduate Thesis. Department of Biological Sciences, Towson University, Towson, MD.

²¹ Ernst, C.H. and J.E. Lovich. Turtles of the United States and Canada. 2nd Edition, Johns Hopkins University Press, Baltimore; , Vogt, R.C. 1980. Natural history of the map turtles *Gratemys pseudogeographica* and *Gratemys ouachitensis* in Wisconsin. Tulane Studies in Zoology and Botany 22:17-48.

²² Richards and Seigel 2009 & 2011

spawn, and reservoir storage has trapped spawning substrate above the dam, this likely underestimates total habitat loss as a result of the ongoing, and proposed future operations of the dam. While this reach of the river was not listed as critical habitat for the Atlantic sturgeon Chesapeake Bay DPS, sturgeon have occurred on the reach of river affected by the Project, and changes in project operations could nonetheless benefit Atlantic sturgeon. Particularly in drier years when the salinity gradient moves upstream and into the tributaries.²³

B. Impacts on the timing and quality of sediment and nutrient loads to the Susquehanna River and Chesapeake Bay

The Application states that, “relatively little sediment is introduced from Project lands” (see pp. 19). While we agree with that statement, and recognize that the Upper Susquehanna as well as other major tributaries of the Chesapeake Bay contribute a far greater proportion of excess nutrients and sediment loads, the record shows that the Project nonetheless has an incremental and measurable effect on water quality conditions in the Lower Susquehanna River and Upper Chesapeake Bay, and that this contribution may impact MDE’s compliance with the Chesapeake Bay TMDL.²⁴

Proposed PM&E measures in the Application only address shoreline erosion and do not propose mitigation to reduce or avoid the impacts of (1) the direct and indirect water quality impacts of scour events that mobilize sediment stored in the Applicant’s reservoir or (2) the influence in low flow conditions, during warm late summer months, in increasing the bioavailability of nutrients.

In recent decades, increasing nutrient concentrations below Conowingo Dam contrast trends observed above the reservoir system.²⁵ This has highlighted an urgent need to better understand how the reservoir system affects water quality.

The 2015 Lower Susquehanna River Watershed Assessment (LSRWA) specifically assessed the impact of scouring events (capable of mobilizing sediment stored in Conowingo pond), on downstream water quality. The study found negative effects on nutrient loading, dissolved oxygen (DO), water clarity and chlorophyll a concentrations, including an increase in

²³ Niklitschek, E.J and D.H. Secor. 2005. Modeling spatial and temporal variation of suitable nursery habitats for Atlantic sturgeon in the Chesapeake Bay. *Estuarine, Coastal and Shelf Science* 64 (2005) 135-148.

²⁴ Cornwell, J., M. Owens, H. Perez, and Z. Vulgaropoulos. 2017. The Impact of Conowingo Particulates on the Chesapeake Bay: Assessing the Biogeochemistry of Nitrogen and Phosphorus in Reservoirs and the Chesapeake Bay. UMCES Contribution TS-703-17. Final Report to Exelon Generation and Gomez and Sullivan. July 28, 2017. Li, 2017. UMCES Comprehensive Proposal: The impacts of Conowingo particulates on the Chesapeake Bay; Lower Susquehanna River Watershed Assessment, Maryland and Pennsylvania, May 2015 Final. Found at: <http://dnr.maryland.gov/waters/bay/Pages/LSRWA/Final-Report.aspx>.

²⁵ Hirsch, R.M. 2012. Flux of nitrogen, phosphorus and suspended sediment from the Susquehanna River Basin to the Chesapeake Bay during Tropical Storm Iee, September 2011, as an indicator of the effects of reservoir sedimentation on water quality: U.S. Geological Survey Scientific Investigations Report 2012-5185. U.S. Geological Survey, Reston, VA; Zhang, Q. D.C. Brady and W.P. Ball. 2013. Long-term seasonal trends of nitrogen, phosphorus and suspended sediment load from the non-tidal Susquehanna River Basin to Chesapeake Bay. *Sci Total Environment* 452-453:208-221.

frequency of non-attainment of DO standards.²⁶ The LSRWA also found that the effects on these constituents are more severe if the event occurs during the summer and that the impacts can last for years.

The recently released 2017 University of Maryland Center for Environmental Science (UMCES) studies confirm and add to the understanding of the incremental effects on loading. Specifically, they provide a better understanding of the potential release of bio-available nutrients (phosphorus and nitrogen (in the form of ammonia)) to the upper and mid-Bay.

While recent studies have improved our ability to characterize the incremental effect of Conowingo Pond on sediment and nutrient dynamics as they concern the Bay TMDL, a few key questions remain:

1. **How do low flow conditions in the reservoir, especially during dry years and warm summer months, affect the bioavailability of phosphorus?**

Water quality trends suggest that excess phosphorus loads continue to increase and present a major challenge to achieving the Chesapeake Bay TMDL; the source of excess phosphorus, however, remains uncertain.²⁷ Cornwell (et al. 2017) notes that the study years (2015 and 2016) occurred under average and above average hydrologic conditions. During the study period, bottom water conditions remained aerobic. Previous observations in the reservoir suggest that bottom water hypoxia has occurred in the past. Low flow conditions could play a role in regulating downstream export of bio-available phosphorus and other contaminants of concern, especially during dry years and warm summer months when low oxygen conditions typically occur, *see* Section 2, *infra*.²⁸ Any mitigation program, should continue to design and implement research that refines our understanding of reservoir dynamics.

2. **How does the volume, type and timing of scour event affect the relative contribution of total load and the bioavailability of nutrients from the event – including extreme events as a result of climate change?**

Existing observations of storm events show that the relative contribution of material scoured from Conowingo Pond as compared to the upstream watershed contribution varies with the type of event (e.g. 2011 Sept. Tropical Storm Lee compared to a Jan. 1996 snowmelt event). The LSWRA study found that the effects on these constituents are more severe if the event occurs during the summer.

²⁶ LSWRA 2015

²⁷ Metson, G.S., J. Lin, J.A. Harrison, and J.E. Compton, 2017. Linking Terrestrial Phosphorus Inputs to Riverine Export across the United States. *Water Research* 124:177–191.

²⁸ Cornwell et al. 2017; Doig, L.E., R.L. North, J.J. Hudson, C. Hewlett, K.E. Lindenschmidt, K. Liber. 2016. Phosphorus release from sediments in a river-valley reservoir in the northern Great Plains of North America. *Hydrobiologia*. Doi: 10.1007/s10750-0162977-2)

Routine bathymetry surveys, which the Applicant has already committed to provide every five years, will be critical to characterizing the integrated impacts of upstream sediment contributions and internal reservoir depositional and scouring patterns. In addition to surveys every five years, it will be critical to add surveys after major scour events (> 275,000 cfs). This information is critical to understanding the role of the Conowingo Reservoir in regulating downstream water quality. As highlighted by Cornwell and others, reservoir sediment chemistry, including internal phosphorus and nitrogen transformations, also should also be evaluated to fully understand impacts and inform an adaptive reservoir sediment management plan to be consistent with Bay TMDL goals, over the term of the certificate.

3. **How does downstream coarse sediment starvation affect water quality regulators (e.g. mussels, emergent vegetation and submerged aquatic vegetation)?**

In addition to changing the timing and quality of inputs, Conowingo Dam traps a large portion of coarse sediments, resulting in downstream ‘starvation,’ of sands and gravels critical for aquatic habitat. The loss of habitat-forming gravels in combination with daily peaking, has resulted in a loss of recruitment for communities that require these habitats, including mussels, SAV, EAV and gravel spawners (Attachment 2). Only a small percentage of fine particles, are trapped. The latter tend to settle across the Upper Chesapeake Bay. In addition to having a direct impact on these communities, the Project indirectly impacts the regulating services that these communities once provided in improving water clarity, buffering extreme temperatures and dissolved oxygen.²⁹

4. **What are the most feasible, best practicable technologies (BPT) or interventions to mitigate the Project’s incremental impact (direct, indirect and cumulative) on achieving the Chesapeake Bay TMDL?**

Currently, there is no comparison of effectiveness or feasibility across the BPTs. The Conowingo Project’s incremental impacts to the attainment of water quality standards and related designated uses should be mitigated through a multi-pronged, holistic and cost-effective solution that considers the range of interventions including upstream floodplain and river corridor restoration, innovative reservoir operations, and active sediment management.

Recent studies suggest that dredging is not likely to provide a cost-effective approach to sediment management and Bay restoration (LSRWA 2015).³⁰ If dredging is pursued, targeted dredging should be considered as previous studies indicate discrete areas of sediment deposition and scouring occur within the reservoir. Inactive areas where trapping capacity can be best restored, however, also may hold historically contaminated sediments and release additional pollutions (Cornwell et al. 2017). The Department should consider these tradeoffs.

In summary, the record shows that the Project has an incremental and measurable contribution to sediment and nutrient loading in the Lower Susquehanna River and Upper

²⁹ Vaughn, C.C. 2017. Ecosystem services provided by freshwater mussels. *Hydrobiologia*, 1-13.

³⁰ LSWRA 2015

Chesapeake Bay, and that this contribution may impact MDE's compliance with the Chesapeake Bay TMDL.³¹ We recognize that the Upper Susquehanna as well as other major tributaries of the Chesapeake Bay contribute a far greater proportion of excess nutrients and sediment loads. We ask MDE to address the incremental impact of Project operations on meeting the goals of the Bay TMDL in its review of the Application and in the development of any certification conditions including the development of an adaptive management plan to address remaining questions.

III. The Conservancy Recommends Additional Procedures Prior to Hearing.

The Conservancy requests that the Department undertake the following procedures prior to scheduling hearing.

First, we request that the Department undertake the additional information gathering and analysis requested herein prior to developing a draft water quality certification. The Department should assess the ecological benefits of the proposed flow regime using models developed for the proceeding. Similarly, the new information learned in the UMCES sediment studies should be used upon finalizing the defined impact of Project operations, and Exelon should be directed to propose mitigation for their impacts.

Second, we request that the Department issue a draft water quality certification for public comment before convening a public hearing, proposed for this fall, and issuing a final certification.

Third, we request the Department provide a preliminary list of disputed issues of facts of law for which it intends to request evidence. The Conservancy reserves the right to request to present evidence at the hearing depending on the list of disputed issues of facts and law.

Fourth, we request to be added to both the interested parties and the service list to receive copies of all future filings by Exelon and others. Notices should be sent to:

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³¹ Sanford et al. 2017; Cornwell et al 2017; LSRWA 2015.

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IV. Conclusion

The Conservancy thanks the Department for the opportunity to comment on the Application. We request that the Department consider the new information provided herein, and grant the requests for further procedures. We support and incorporate by reference the substantive comments of the Chesapeake Bay Foundation and the Susquehanna River Basin Commission. We reserve the right to supplement these comments as new or additional information that is relevant to the proposed certification becomes available. We look forward to participating in public meeting and otherwise assisting the Department in the development of the record for this proceeding.

Respectfully submitted,



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Attachments

Attachment 1. June 2016 Comments by The Nature Conservancy on Offer of Settlement for Fish Passage (Conowingo Project, P-405) TNC comments on fish passage settlement agreement

Attachment 2. January 2014 The Nature Conservancy's Motion to Intervene, Recommended Alternatives for Environmental Analysis and Preliminary Terms and Conditions;

Att2 - Appendix 1: TNC Summary Report on Estimated Impacts to Ecological Resources and Restoration Goals

Attachment 3. Expert testimony by Dr. Claire Stalnaker.

Attachment 4. April 2015 Comments by The Nature Conservancy on Final Environmental Impact Statement for Susquehanna River Hydroelectric Projects

