BEFORE THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

EXELON GENERATION COMPANY, LLC 300 Exelon Way Kennett Square, PA 19348	))))	FERC PROJECT No. P-405 MDE WSA Application No. 17-WQC-02

PROTECTIVE PETITION FOR RECONSIDERATION AND ADMINISTRATIVE APPEAL

On April 27, 2018, the Maryland Department of the Environment ("MDE") issued a "Clean Water Act Section 401 Certification for the Conowingo Hydroelectric Project" (the "Certification") in response to MDE WSA Application No. 17-WQC-02. *See* Certification at 1, *attached as* Exhibit A. The Certification declares: "This is a final decision on the Application." *Id*. at 27. But it also recognizes that after "the Department's decision on the request for reconsideration, a contested case hearing shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq." As explained below, while MDE purported to issue the Certification as a "final decision," it could not lawfully be issued as a final decision under Maryland law. Nonetheless, on May 8, 2018, MDE filed the Certification with the Federal Energy Regulatory Commission ("FERC"). *See* Exhibit B, attached, at 1 ("As requested by the FERC Office of Energy Projects, enclosed please find a copy of the Water Quality Certification issued by the Maryland Department of the Environment ('MDE') pursuant to Section 401 of the Clean Water Act for the above-referenced project (the 'WQC')."). FERC could now, at any time, incorporate the Certification's conditions into the Conowingo Project's federal license.

Because of the harm that the unlawful Certification could imminently inflict, Exelon has filed a Complaint for Declaratory and Injunctive Relief, and in the Alternative, Petition for Judicial Review and Complaint for Mandamus in the Circuit Court for Baltimore City, Maryland. *See*

Exhibit C, attached. In that filing, Exelon seeks declaratory relief declaring that MDE could not lawfully issue the Certification as a "final decision" and that the Certification is void, invalid, and without effect, and an injunction enjoining MDE to notify FERC that it is withdrawing the Certification. To the extent the Certification is deemed final or otherwise subject to judicial review on the merits, Exelon also seeks the invalidation of the Certification. *See* COMAR 26.01.02.38 (a "request for reconsideration is not a prerequisite to judicial review"). Exelon has also requested a stay of the Certification.

Simultaneously, Exelon is also seeking federal-court review of certain threshold federal-law issues under the Clean Water Act, as well as consideration of other federal-law claims. *See* Exhibit D, attached.

In this filing, Exelon petitions for reconsideration and administrative appeal of the Certification pursuant to COMAR 26.08.02.10(F)(4), to the extent that MDE retains jurisdiction to reconsider its decision. *See* Certification at 27 ("Any person aggrieved by the Department's decision to issue this Certification may appeal such decision in accordance with COMAR 26.08.02.10F(4)."); *cf. Friends of Croom Civic Ass'n v. Prince George's Cty. Planning Bd. of Maryland-Nat'l Capital Park & Planning Comm'n*, No. 2177, Sept. Term 2015, 2017 WL 1833206, at *2 (Md. Ct. Spec. App. May 8, 2017) ("a petition for judicial review divests an administrative agency of jurisdiction to reconsider its decision"). This Petition is timely, as it is filed within 30 days of the Certification's publication in the *Maryland Register*. COMAR 26.08.02.10(F)(4)(a). Exelon also asks MDE to stay the Certification while judicial review and/or MDE reconsideration are pending.

I. INTRODUCTION

The Chesapeake Bay is the largest estuary in the United States and a critical natural resource for the people of Maryland. Exelon, through its subsidiaries, delivers electricity to the overwhelming majority of Maryland homes and businesses, and Exelon strives to support the environmental goals of all its customers and the States in which the Company operates. Exelon also is the owner and operator of the Conowingo Hydroelectric Project ("Project"), a dam and hydroelectric facility on the lower Susquehanna River that generates more renewable electricity than all other facilities in the State of Maryland combined. Exelon has been, and remains, committed to operating the Project in a manner that is environmentally responsible in all respects.

Because the Project is seeking a new operating license from FERC, Exelon is required by Section 401 of the federal Clean Water Act ("CWA") to obtain a certification from Maryland that the Project's discharge will comply with applicable provisions of the CWA and state law. *See* 33 U.S.C. § 1341. MDE has purported to issue such a certification, but only upon conditions that are unlawful, unreasonable on their face, and unsupported by evidence. Among other things and as described more fully in this Petition, the Certification purports to impose a requirement that the Project "shall annually reduce" by millions of pounds the amount of nitrogen and phosphorus discharged into the Susquehanna River by upstream sources, even though these nutrients were not added to the river by the Conowingo Project, but already are present in the Susquehanna River before the river water reaches the Project. Similarly, the Certification requires the Project to remove "all" visible trash and debris from the Susquehanna River, regardless of where that trash entered the river along its 464-mile course, or who deposited it. The Certification requires the Project to take onerous measures to stop invasive species of fish from moving upstream, even

though the dam does not contribute to the upstream migration of invasive fish species, but instead helps block such migration.

In sum, simply because Exelon's federal license was subject to renewal, the Certification imposes on Exelon the costs of cleaning up a watershed that Exelon did not pollute. In these and other ways described further below, Maryland has placed obligations on the Project that unlawfully exceed MDE's authority, are arbitrary and capricious, violate due process, and are inconsistent with basic common sense and fundamental fairness. Exelon shares Marylanders' concerns that pollution is jeopardizing the health of the Chesapeake Bay, and Exelon will continue to partner with state and local governments to protect this essential ecosystem. But it is unreasonable for the State of Maryland to expect Exelon to shoulder the entire burden of removing excess nutrients and all trash at the end of a 464-mile river.

The Certification's conditions are unlawful in multiple respects. First, they exceed the State's authority under the Clean Water Act. The Clean Water Act limits the introduction of pollutants into the navigable waters. It does not demand the removal of pollutants from the navigable waters. Or put differently, the Clean Water Act is a pollution-control statute, not a pollution-cleanup statute. So the Clean Water Act does not hold dam operators liable for cleaning up or removing pollutants that were added by upstream sources. Moreover, the plain text of Section 401 of the Clean Water Act shows that an applicant for a federal license cannot be held responsible for pollutants that it did not itself add to the navigable waters, for nonpoint-source pollution (as is the case here), or for problems that lack an adequate nexus to the activity of the applicant, as opposed to the activities of some third party. In all these respects, the Certification's conditions exceed the scope of state authority under Section 401. 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 Envt'l Protection*, 547 U.S. 370 (2006). But MDE significantly exceeds that authority in the Certification.

Second, the Certification is inconsistent with the comprehensive Chesapeake Bay ecosystem-restoration plan that is administered by the U.S. Environmental Protection Agency ("EPA"). In 2010, based on detailed studies and computer modeling, EPA identified the "total maximum daily load" ("TMDL") required to implement the applicable water-quality standards for the Chesapeake Bay. 33 U.S.C. § 1313(d). Based on its computer models, EPA identified ***reductions*** in the amounts of nutrients (like nitrogen and phosphorus) reaching the Bay that needed to be achieved by 2025 to restore the health of the Bay. EPA then allocated these reductions equitably among the seven jurisdictions, including Maryland, that are responsible for the addition of nutrients into the waterways, including the Susquehanna River, that flow into the Bay. In 2017, at the mid-point of the 15-year target period between 2010 and 2025, newer computer models showed that EPA's original estimate of the amount that nutrients needed to be reduced to restore the health of the Bay was insufficient, and additional reductions would be needed. EPA is in the process of determining how those additional reductions should be achieved.

However, in the Certification, MDE has determined that ***the Conowingo Project*** must bear responsibility to remove from the Susquehanna River all additional reductions that are needed to meet the TMDL. The Certification thus displaces EPA's anticipated reallocation of those reductions among the seven jurisdictions, ***including Maryland***, responsible for achieving the nutrient reductions needed to restore the health of the Bay. Maryland lacks authority to commandeer EPA's comprehensive Chesapeake Bay ecosystem restoration plan and shift nutrient-reduction responsibility from ***itself***, and other States, onto Exelon, simply because the Project happens to be in the process of seeking a FERC operating license.

The entire Certification is a classic example of State overreaching — and these are only some of the reasons why the Certification is unlawful. As described further below, the Certification is also unlawful because it is arbitrary and capricious, lacks support in the administrative record, and otherwise violates federal and state law.

MDE also should stay the unlawful Certification while it is being reconsidered. MDE should continue to work with Exelon, as Exelon is committed to do, to achieve a Certification that will advance the laudable goals of the people of Maryland and protect the vital Chesapeake Bay ecosystem in a manner that is lawful.

II. FACTUAL BACKGROUND

Through its issuance of the Certification, MDE is familiar with the Project and its need for a 401 certification. The following summary highlights certain key facts.

A. The Conowingo Hydroelectric Project

Exelon owns and operates the Conowingo Project, a 573-megawatt hydroelectric power plant located on the lower Susquehanna River in Maryland. The Susquehanna River flows for nearly 450 miles through New York and Pennsylvania and then through Maryland for about 15 miles before emptying into the Chesapeake Bay, North America's largest estuary. The Conowingo Project is located about ten miles upstream of where the Susquehanna River flows into the Chesapeake Bay. The watershed for the Susquehanna River drains a land area of more than 27,000 square miles and includes over 40,000 miles of waterways in New York, Pennsylvania, and Maryland upstream of the Conowingo Project.

Since its construction in 1928, the Conowingo Project has provided multiple benefits to the Chesapeake Bay, surrounding communities, and the State of Maryland. Though never required by

law to perform a pollution-reduction function, the Conowingo Project historically has protected the water quality of the lower Susquehanna River and the Chesapeake Bay by trapping some of the nutrient pollution introduced into the River by upstream sources in Pennsylvania and New York, reducing its potential to reach the Bay. Without the Conowingo Project, these pollutants would have entered the Bay years ago.

The pollutants at issue are generated upstream of the Project. The Project does not generate any nutrients (such as nitrogen or phosphorus). As with any dam, however, the Project's trapping capacity has been declining for many decades, as sediment flowing downstream was deposited in the Conowingo Reservoir, reducing its depth.

The Conowingo Project also provides benefits to wildlife. It provides breeding, nesting, and foraging grounds for the American Bald Eagle and helps migratory and native fish travel over the dam for spawning in the Susquehanna River, using multimillion-dollar fish lifts. For nearby residents as well as visitors, the Conowingo Project provides opportunities for educational programs and for recreation, including boating, hiking, fishing, and birdwatching. It provides 15 recreational facilities and public-access areas, including boat launches, marinas, and scenic overlooks.

The Conowingo Project generates approximately $273 million in annual economic benefits to Maryland and its local communities by supporting full-time jobs, driving tourism in northeastern Maryland, and contributing to local and state tax revenues.

And the Conowingo Project is Maryland's largest source of renewable energy, producing more than 55% of Maryland's renewable energy. Compared to a coal facility of similar size, the Conowingo Project avoids the release of 6.5 million tons of greenhouse-gas emissions annually.

B. FERC Relicensing of the Conowingo Project

Exelon is seeking renewal by FERC of its operating license for the Conowingo Project for a term of 50 years. Exelon is pursuing the relicensing using FERC's integrated licensing process, which involves consultation with regulatory agencies and stakeholders on various issues, including fish passage, water quality, shoreline management, and recreational conditions.

In support of the integrated licensing process, Exelon developed a study plan during the pre-application stage, in or about 2009. Under that plan, Exelon performed more than 45 separate studies regarding various environmental issues, including fish passage, stream flow, the movement (transport) of sediment, and water temperature. Exelon also supported or cooperated with additional studies or evaluations by the United States Army Corps of Engineers (the "Army Corps") and EPA that extended beyond the Conowingo Project and more broadly concerned the Chesapeake Bay. Exelon completed these studies in 2012. On August 31, 2012, Exelon filed an application with FERC to renew its operating license for the Conowingo Project.

In 2015, FERC issued an Environmental Impact Statement ("EIS") for three hydroelectric projects on the lower Susquehanna River, including the Conowingo Project. *See* FERC, *EIS – Susquehanna River Hydroelectric Projects: York Haven Hydroelectric Project (P-1888-030), Muddy Run Pumped Storage Project (P-2355-018), and the Conowingo Hydroelectric Project (P-405-106)* (Mar. 11, 2015). FERC's EIS concluded that for dissolved oxygen, existing project operation generally does not exceed state water-quality standards. The EIS noted that the Susquehanna River is the largest source of freshwater to the Chesapeake Bay, contributing about 70% of the total nitrogen and 55% of the total phosphorus, and that the presence of these pollutants is a watershed-wide issue. The EIS stated that, if the reservoirs' capacity to store sediment and

other pollutants was reduced, then "governmental jurisdictions in the watershed might need to increase their … nutrient-reduction efforts." *Id.* at 138.

The EIS also considered whether dredging might be a reasonable way to increase the Conowingo Reservoir's trapping capacity. Citing the Lower Susquehanna River Watershed Assessment ("LSRWA"), a joint effort of the Army Corps and MDE, FERC's EIS reported "that operational changes at Conowingo would not address the sediment transport issue, and that dredging of Conowingo [Reservoir] would be cost prohibitive and ineffective." *Id.* at 139.

As part of the relicensing process, Exelon engaged in detailed negotiations with the United States Department of the Interior and entered into a settlement. Maryland participated in this portion of the integrated process.[1] Exelon committed to enhancing fish passage by trapping and transporting fish to reduce the time it takes them to reach spawning locations. As part of the settlement, Exelon will haul the fish not just to the Conowingo Reservoir, but further upstream past three additional dams to ensure that a high percentage of fish successfully complete their journey. Exelon also committed to efficiency evaluations that will inform whether and when additional fish passage improvements are required. Exelon will perform enhancements to fish passage that are demonstrated to be necessary based on a data-driven Department of the Interior determination.

C. Section 401 of the Clean Water Act

As part of the relicensing process for federal hydroelectric facilities, applicants are required to seek a state certification under CWA Section 401. That statute provides States the opportunity to review requests by applicants for federal licenses and to certify whether the discharge associated

[1] In addition, prior to execution of the settlement agreement, Exelon requested that Maryland sign the settlement agreement. Although supportive of the settlement, Maryland indicated that it could not timely obtain the necessary internal approvals to sign on to the settlement.

with the activity being licensed will comply with specific CWA provisions. 33 U.S.C. § 1341(a)(1). A State may grant a certification under this Section ("a 401 certification"), either with or without conditions, deny a certification, or waive its power to grant or deny. 33 U.S.C. § 1341(a)(1).

In providing a conditional 401 certification, a State may "set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure" that the applicant "will comply" with various limitations under designated CWA provisions, where applicable, "and with any other appropriate requirements of State law." 33 U.S.C. § 1341(d). Limitations or requirements set forth in a conditional 401 certification "shall become a condition on [the applicant's] Federal license." 33 U.S.C. § 1341(d). FERC believes that it lacks the authority to review the legality of State-imposed conditions and is required to incorporate them in the federal hydroelectric license, even if they are inconsistent with federal law.

D. Maryland's Prior Certifications of the Conowingo Project

Maryland has no statute that references or provides substantive or procedural requirements with respect to 401 certifications. MDE has promulgated procedural regulations for considering requests for 401 certifications at COMAR 26.08.02.10. These regulations mandate that a 401 certification be issued when MDE "determines the proposed activities will not ***cause*** a violation of applicable State water quality standards." COMAR 26.08.02.10(E)(1) (emphasis added). Thus, under the regulation, there must be a causal connection between any conditions imposed and the "proposed activities" subject to certification.

Consistent with this approach, the State of Maryland issued a certification for operation of the Conowingo Project in 1975 ("1975 Certification"). A copy of the State's certification is attached hereto as Exhibit E. The 1975 Certification set forth a single requirement: to "insure that

the operation of the facility will comply with appropriate requirements of State law," the Conowingo Project must "be operated at all times in such a manner as to conform to the requirements contained in State Permit No. 75-DP-0491 attached hereto." State Permit No. 75-DP-0491 was a permit issued under the National Pollutant Discharge Elimination System, which authorizes discharges from the Conowingo Project.

The State has continuously renewed State Permit No. 75-DP-0491, with the most recent renewal occurring in 2014. The current version is numbered State Permit No. 10-DP-0491. This version became effective on October 1, 2014, and expires on September 30, 2019. State Permit No. 10-DP-0491 is attached hereto as Exhibit F. State Permit No. 10-DP-0491 authorizes discharges from the Conowingo Project, subject to effluent limitations and monitoring requirements for water flow, biochemical oxygen demand, total suspended solids, dissolved oxygen, pH, oil and grease, and total residual chlorine. Under the relevant regulations, "[d]ischarges permitted by the Department under the National Pollutant Discharge Elimination System are certified by the Department"; as a result, State Permit No. 10-DP-0491 is also "a certification from this State that the activity does not violate State water quality standards or limitations." COMAR 26.08.02.10(A). Further, State Permit No. 10-DP-0491 states that "[t]his permit is consistent with the terms and conditions of the Chesapeake Bay Total Maximum Daily Load (TMDL) for Sediments, Nitrogen, and Phosphorus, approved December 29, 2010."

The 1975 Certification has never been withdrawn and remains valid today. As stated above, State Permit No. 10-DP-0491 remains valid and does not expire until September 30, 2019.

E. Exelon's Recent Application to MDE for 401 Certification

On January 31, 2014, Exelon submitted a request to MDE for a 401 certification in connection with the current FERC relicensing of the Conowingo Project. That application

included copies of studies that had been completed as part of the FERC relicensing process. In response to the application, MDE asked Exelon to conduct an additional study to understand the impacts of sediment transport on water quality in the Susquehanna River and the Chesapeake Bay (the "Sediment Study"). While Exelon believed its application was complete and that no additional study was required for MDE to issue a 401 certification for the Conowingo Project, in December 2014 Exelon entered into an agreement with MDE to work with Maryland agencies, the Army Corps, the U.S. Geological Survey, the University of Maryland Center for Environmental Science, and EPA to design and conduct a multi-year Sediment Study, to provide additional information to MDE. Exelon paid $3.5 million to fund the Sediment Study.

States must act on applications for 401 certifications within one year, but the Sediment Study would not be completed within that time. On December 4, 2014, cognizant of MDE's desire for additional study, Exelon provided MDE with more time by withdrawing its application for a 401 certification and then timely refiling. Exelon refiled its application for a 401 certification on March 3, 2015, and withdrew that application on February 5, 2016, pending conclusion of the Sediment Study. Exelon again refiled its application on April 25, 2016, and withdrew that application on February 17, 2017.

Each time Exelon withdrew and refiled its application, it did so to cooperate with MDE's stated desire for more time to study the 401 certification request. On March 13, 2017, MDE indicated that it expected to receive Exelon's resubmission no later than May 18, 2017, and would, upon receiving the resubmission, initiate its review of the water-quality impacts associated with the Conowingo Project. On May 17, 2017, Exelon submitted another request to MDE for a 401 certification in connection with the relicensing of the Conowingo Project.

The studies that Exelon submitted to MDE as part of its request and the information in the record before MDE demonstrate that the Conowingo Project is not the source of pollution entering the Susquehanna River. They also demonstrate that the Project is meeting all applicable state water-quality standards in waters immediately downstream. The Sediment Study confirmed that Conowingo Project operations introduce negligible amounts of sediment into the water, solely from natural causes, and do not cause downstream water-quality violations that may result from sediment transport. *See Lower Susquehanna River Watershed Assessment, Maryland and Pennsylvania*, at 158 (2015); *see* EIS at 74-75, 77.

Similarly, the Water Quality Study shows that the average dissolved-oxygen ("DO") conditions within all of the turbine boils are always at or above standards, that DO standards in the tailrace (where water from the turbines is discharged) are met, that DO standards are being met immediately downstream of the Project, that minimum and maximum turbidity values recorded downstream are within state water-quality standards, and that operation of the Conowingo Project has no measurable effect on the temperature of the water being released downstream. *See Final Study Report: Seasonal and Diurnal Water Quality in Conowingo Pond and Below Conowingo Dam*, at ii-iv, 20-22 (Conowingo RSP 3.1). Likewise, the aquatic-resources studies show that the Conowingo Project is not adversely impacting fish propagation and instead supports a diverse assemblage of fish and a healthy multi-species sport fishery supported by natural reproduction. *See Final Study Report Impact of Plant Operation on Migratory Fish Reproduction*, at 22-24.

F. MDE's Issuance of the 401 Certification

On April 27, 2018, MDE issued the Certification to Exelon pursuant to CWA Section 401; Title 9, Subtitle 3 of the Maryland Code, Environment Article; and COMAR 26.08.02. In a departure from the State's previous 401 certifications and previous recognition by the State and

others of the Conowingo Project's benefits to the Bay, the Certification asserts that "the Project adversely impacts water quality in the State of Maryland."

The Certification imposes conditions that go far beyond the requirements of the 1975 Certification and State Permit No. 10-DP-0491, without attempting to explain what changed circumstances would justify this departure, and require Exelon to address impacts on the Susquehanna River that are caused by upstream polluters and are unrelated to the activities of the Conowingo Project.

The Certification contains conditions regarding dissolved oxygen that, among other things, require Exelon to undertake Required Nutrient Reductions that would annually reduce the amount of nitrogen and phosphorus in the Project's discharges by 6,000,000 pounds and 260,000 pounds, respectively. (High levels of nutrients such as nitrogen and phosphorus can cause low levels of dissolved oxygen.)

The Certification provides no authority for requiring Exelon to remove nutrients from the Susquehanna River rather than imposing future nutrient reductions on the sources of those nutrients. Nor does the Certification identify any effective or reasonable means to achieve this massive nutrient removal at the Conowingo Project, which is downstream from the sources of these pollutants.

Instead, MDE seeks payment from Exelon in excess of $172 million annually, the installation of best management practices and/or ecosystem restoration activities, and/or dredging of the Conowingo Reservoir. None of these purported nutrient-reduction methods actually addresses the sources of the pollution.

Section 7.D.iv of the Certification provides that Exelon "shall provide to MDE for review and approval, no later than December 31, 2019, a nutrient corrective action plan (the 'NCAP') for

achieving the Required Nutrient Reductions and otherwise ensuring that DO [dissolved oxygen] levels in the DO Non-Attainment Area [two segments in the central Chesapeake Bay] are not adversely impacted by Project operations and discharges." Section 7.D.iv further provides that Exelon's "NCAP may propose any combination of corrective action strategies," including: (1) "[d]redging the Reservoir," *id.* § 7.D.iv.c; (2) "[i]nstallation of best management practices and/or ecosystem restoration actions," *id.* § 7.D.iv.b; or (3) "[p]ayment of an in-lieu fee" prescribed by MDE, *id.* § 7.D.iv.a.

None of these conditions is related to Exelon's own activities. Instead, the conditions all relate to the abatement of pollution introduced into the Susquehanna River by others. Moreover, neither dredging nor the installation of "best management practices" or "ecosystem restoration actions" is a workable method for attaining the Bay's dissolved-oxygen standards. Thus, the in-lieu fee is the Certification's dominant condition. The Section 7.D.iv conditions present only an illusion of genuine "options" for Exelon. The conditions were designed to leave Exelon with no choice but to pay Maryland a massive annual fee.

1. Dredging the Conowingo Reservoir

As Maryland itself has conceded (in a report that MDE co-authored with the Army Corps), dredging is an impractical solution whose high costs cannot be justified by water-quality benefits that would likely be both minimal and short-lived. Dredging and disposing of this much sediment is not feasible, and would itself cause environmental harm. For numerous reasons, dredging the reservoir is not a realistic option.

It is impossible at this time to precisely project the full costs of dredging the Conowingo Reservoir. But the MDE/Army Corps LSRWA study estimated that the cost of a limited dredging program could total as much as $2.8 billion. And based on the projected costs of a pilot dredging

program proposed by Maryland (which has yet to obtain regulatory approval or commence), it appears that dredging to merely maintain the Reservoir's current depth could cost more than $900 million per year. As MDE and the Army Corps noted, those costs are likely to increase over time as convenient sites for disposing of the dredged sediment become scarcer.

Dredging would also significantly diminish the community's enjoyment of the fisheries and other recreational activities at Conowingo Reservoir. Any ecosystem benefits from dredging would be short-lived. With the Susquehanna River's 27,000-square-mile watershed, significant and continuous sediment deposition is unavoidable. According to MDE and the Army Corps, a dredging program would be hard-pressed even to "keep[] up" with new deposition, much less to return the Reservoir to twentieth-century conditions. EIS at 80.

According to the MDE/Army Corps report, dredging would have little beneficial effect on the environment because it would result in only "minor" improvements in ecosystem conditions and would have little effect on water-quality conditions in the Chesapeake Bay. *Id.* at 139. In its EIS, FERC credited the MDE/Army Corps report's findings that "dredging of Conowingo [Reservoir] would be cost prohibitive and ineffective" and concluded that there was "no justification at this time for requiring Exelon to implement measures such as dredging to help control sediment and nutrient loading in the Bay, which would occur in the long term whether or not Conowingo Dam was in place." *Id.* And State-imposed dredging would require Exelon to remove pollutants introduced into the Susquehanna River not by Exelon, but by polluters in New York and Pennsylvania.

2. Best Management Practices and/or Ecosystem-Restoration Actions

Generally, Exelon embraces best management practices for the Project lands that Exelon owns. But the Project lands cover a miniscule portion of the Susquehanna River basin, so these

practices are insignificant compared with the Certification's massive Required Nutrient Reductions. The Certification does not identify "best management practices" or "ecosystem restoration actions" that could potentially achieve the targeted level of nutrient reductions.

3. In-Lieu Fees

Under Section 7.D.iv.a of the Certification, Exelon's NCAP may propose "payment of an in-lieu fee annually at $17.00 per pound of nitrogen and $270.00 per pound of phosphorus in accordance with payment instructions provided by MDE from time to time" and subject to adjustments for inflation. This condition would result in annual payments from Exelon to MDE of more than $172 million, totaling more than $7 billion over the term of the license — or roughly a half-million dollars ***per day*** for 40-plus years. In-lieu fees under the Certification will automatically escalate with inflation and may be further increased under the Certification's reopener provisions, which purport to allow MDE to amend the Certification conditions at any time.

The Certification does not identify or constrain how Maryland will spend this money. But even aggressive pollution-control and pollution-reduction efforts focused solely on the Conowingo Project and other parts of the Susquehanna River watershed that fall within the confines of Maryland would be insufficient to cure the identified dissolved-oxygen problem in the Bay.

The Certification's conditions are unprecedented. MDE's Certification for the Conowingo Project is the first Section 401 water-quality certification for a FERC-licensed hydroelectric project, anywhere in the Nation, that has been conditioned on the licensee's removal of pollution not caused by the project's operations. The Certification also is the first Section 401 water-quality certification for a FERC-licensed hydroelectric project, anywhere in the Nation, that has been

conditioned on the licensee's payment to a State of an annual multimillion-dollar "fee" in lieu of such removal.

Ordinarily, Section 401 certifications for hydroelectric projects set threshold quantities for compliance (for example, for dissolved-oxygen levels in the dam's tailrace), require the licensee to monitor for quantities inconsistent with that threshold and, if monitoring reveals such quantities, require the licensee to undertake measures to bring the quantities back in line with that threshold. Maryland's Certification for the Conowingo Project departs dramatically from this approach by functionally requiring Exelon to pay the State tens or hundreds of millions of dollars every year for 40-plus years for an unspecified purpose.

4. Other Conditions

Section 7.F of the Certification contains conditions requiring the Conowingo Project to remove, at least 40 times per year, "all" trash and debris that flows down the River into the Project. Section 7.B of the Certification contains fish-passage conditions that exceed the requirements established in Exelon's settlement with the Department of the Interior, without citing any evidence that the additional measures are needed. And some of the Certification's conditions will actually make it easier for invasive species to migrate upstream through the Conowingo Project. Sections 2.C and 7 of the Certification also contain other conditions that provide for planning, additional studies, reopening, and modification by MDE and would allow MDE to impose as-yet-unknown additional requirements on the Conowingo Project.

G. The Chesapeake Bay TMDL

Maryland has unilaterally placed these obligations on Exelon despite the existence of a comprehensive federal regulatory scheme for water quality in the Chesapeake Bay and its tidal tributaries. The CWA establishes distinct roles for the federal and state governments in addressing

water quality in waters of the United States. For the Bay, these federal and state roles have been implemented through EPA's Chesapeake Bay Program, pursuant to CWA Section 117. 33 U.S.C. § 1267. The Chesapeake Bay Program was established as a regional partnership in 1983 to protect and restore the Bay's ecosystem by, among other things, identifying impaired waters, identifying sources of pollutants that cause the impairments, and developing specific plans for reducing pollutants.

To achieve these goals, in CWA Section 117(g)(1), Congress directed the Administrator of the United States Environmental Protection Agency (the "Administrator" or "EPA") to "ensure" that States in the Chesapeake Bay watershed develop management plans and begin implementation "to achieve and maintain … (A) … nutrient goals … for the quantity of nitrogen and phosphorus entering the Chesapeake Bay and its watershed" and "(B) the water quality requirements necessary to restore living resources in the Chesapeake Bay ecosystem." 33 U.S.C. § 1267(g)(1)(A)-(B).

The Chesapeake Bay watershed spans seven jurisdictions: Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia (the "Bay Jurisdictions" or "the States"). The States recognized that water pollution in the Bay is a "tragedy of the commons." Because the Bay is affected by so many sources of pollution throughout its watershed, no single State has sufficient incentive to reduce pollutant loads from its own sources unless it believes that other States will do likewise.

For each waterway in each State, CWA Section 303 requires the State to develop and periodically update "water quality standards." 33 U.S.C. § 1313(c)(2)(A). But the standards can take effect only if EPA approves them. *Id.* § 1313(c)(2)(A), 1313(c)(3)-(4).

For any waters that do not meet applicable water-quality standards, the State may establish a "total maximum daily load" ("TMDL") for each relevant pollutant, at a level necessary to satisfy

the applicable water-quality standards. 33 U.S.C. § 1313(d)(1)(C). A TMDL is essentially a "pollution diet" designed to identify necessary reductions of pollutant loads so that a waterway can meet the applicable water-quality standards.

However, these State-established "loads" cannot take effect unless they are approved by EPA. 33 U.S.C. § 1313(d)(2). If new facts come to light or new scientific methods are developed that indicate that a previously calculated "load" for a particular pollutant in a particular waterway will no longer result in attainment of applicable water-quality standards, the "load" must be amended as necessary to satisfy the water-quality standards. As with the initial load allocation, a load reallocation must be approved by EPA. *Id.* § 1313(d)(2).

EPA exercised its authority under CWA Section 303(d)(2) to establish a comprehensive federal TMDL for the entire Bay watershed that, unique among TMDLs, imposed pollutant reductions on the Bay jurisdictions, including the State of Maryland. Each State in turn had to find ways to secure reductions at the sources of pollution within that State. Following formal public notice and comment, EPA established the Bay TMDL for the Chesapeake Bay on December 29, 2010. EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus, and Sediment* (Dec. 29, 2010) (the "Bay TMDL"). In the Bay TMDL, EPA established a comprehensive "pollution diet" to restore the health of the Bay and the waterways that feed it. *Id.* at ES-2.

H. The Chesapeake Bay TMDL's Pollution Allocations

To calculate pollutant loads, EPA used then-available data and complex computer models that described hydrologic and water-quality processes, estimated the load of each pollutant to each water body, and predicted how the load would change as various remediation methods are implemented. EPA acknowledged in the 2010 Bay TMDL that its "models produce estimates, not perfect forecasts"; that improving data and modeling methods could necessitate "[c]hanging

modeling numbers"; that EPA's models would "be updated continuously according [to] the state of the art of modeling technology"; and that EPA therefore would, over the years, "modify the TMDL" and "adjust[] … the allocations" if necessary based on updates to the models.

In 2010, EPA calculated that, to reach its goals for the Bay's water quality by 2025, significant nutrient reductions of discharges of nitrogen and phosphorus would be required. EPA allocated those total amounts with some specificity. For each of the 92 segments of the Chesapeake Bay watershed, EPA calculated the reductions in nitrogen, phosphorus, and sediment loads, or "allocations," that specific point sources of pollution (such as a factory) and nonpoint-source sectors (such as agriculture) would have to undertake, so that the Bay would satisfy all applicable water-quality standards by 2025. Each segment is located in one and only one of the seven Bay jurisdictions and in one and only one of the eight major river basins (Susquehanna, Potomac, James, Rappahannock, York, Patuxent, Eastern Shore, or Western Shore).

The Bay TMDL does not hold any discharger singularly responsible for restoring the Bay, but instead distributes the obligations to prevent pollution among the seven Bay jurisdictions. In turn, the States became obligated to implement the Bay TMDL through a series of phased-in Watershed Implementation Plans ("WIPs"). WIPs are mandatory, detailed planning documents that each Bay jurisdiction must develop, subject to EPA approval, under CWA Section 303(e). 33 U.S.C. § 1313(e). WIPs identify specific programs to require or encourage polluters to control pollution at its source, ranging from tax incentives to grants to new state regulations and local land-use ordinances.

The Bay TMDL spans 15 years, from 2010 to 2025, when each segment of the Bay is to attain its goals under the States' EPA-approved water-quality standards. There are numerous checkpoints over that period. First, the Bay TMDL requires that States create three WIPs over the

life of the project. States submitted Phase I WIPs to EPA in 2010 and updated, more-detailed Phase II WIPs to EPA in 2012. These WIPs described actions and controls to be implemented by 2017 and 2025. States will submit Phase III WIPs to EPA to provide updated, more-detailed information on actions the States will take through 2025. Second, States are required to follow biennial milestones, which began in 2012, to track progress and evaluate the effectiveness of the WIPs. EPA reviews the milestones and assesses whether they have been met and whether they are sufficient to achieve pollution reduction. Third, EPA set a goal of achieving at least 60% of all pollutant reductions for the 15-year timeframe by 2017, roughly the midpoint between 2010 and 2025.

EPA made clear that revisions to the TMDL's allocations could be proposed by a State, but could be approved only by EPA: "[I]t might be appropriate for EPA to revise the Bay TMDL (or portions of it). EPA would consider a request by the jurisdictions to propose such a revision to the TMDL following appropriate notice and comment. Alternatively, a jurisdiction could propose to revise a portion(s) of the Bay TMDL that applies within its boundaries (including, but not limited to specific [allocations]) and submit those revisions to EPA for approval." Bay TMDL at 10-5.

I. The Conowingo Project and the Chesapeake Bay TMDL

The 2010 Bay TMDL recognized that the Conowingo Project had long kept some pollutants from flowing into the Chesapeake Bay but would eventually fill in under a natural deposition process and thereafter would have diminished ability to serve this protective role. For purposes of the 2010 Bay TMDL, EPA assumed that the Conowingo Project would maintain trapping capacity through 2025. But EPA provided a contingency plan: "If future monitoring shows the trapping capacity of the dam is reduced, then EPA would consider adjusting the

Pennsylvania, Maryland, and New York 2-year milestone loads." Bay TMDL at 10-8. These potential adjustments, EPA explained, would "ensure that each jurisdiction is meeting its obligations." *Id.*

In the years immediately following adoption of the 2010 Bay TMDL, the Chesapeake Bay Program came to believe that the Conowingo Project had already reached "dynamic equilibrium," which means that, over a long period (such as a decade), the amount of pollutants flowing toward the dam from the north and the amount flowing away from the dam to the south would be roughly equal. As a consequence, the dam had effectively lost its long-term trapping capacity, although it continues to provide environmental benefits related to sediment and nutrients.

When preparing for the Bay TMDL's 2017 Midpoint Assessment, EPA learned that upgraded computer models and better data (relating to both the Conowingo Project and many other issues, such as the impacts of economic growth and climate change) showed that the 2010 projections had been overly optimistic. The nutrient reductions that EPA had established in 2010 would need to be increased by at least two or three percent. If the 2010 Bay TMDL allocations for nitrogen and phosphorus were not amended, dissolved-oxygen levels in parts of the Bay would not satisfy applicable water-quality standards by 2025.

Using the upgraded computer models and better data, potential allocations were recalculated. Two of the options considered were (1) concentrating the burden of reallocation (for both nitrogen and phosphorus) solely in the Susquehanna River watershed and (2) spreading that burden across the entire Chesapeake Bay watershed. Under the first option, new calculations showed that the shortfall could be compensated for by reducing nutrient loads in the Susquehanna River by about 6,000,000 pounds of nitrogen and about 260,000 pounds of phosphorus per year — ***precisely the reduction allocated to Exelon in MDE's 401 Certification***. Because only a small

fraction of the Susquehanna River's length and only a small fraction of the sources that pollute the River are located in Maryland, this approach would require Maryland sources of pollution to reduce their loads by only about 120,000 pounds of nitrogen and about 5,000 pounds of phosphorus per year. The rest of the reductions would come from pollution sources in Pennsylvania and New York.

By contrast, under the second option, if the shortfall were compensated for by reducing nutrient loads across the entire Chesapeake Bay watershed, rather than just in the Susquehanna River watershed, Maryland would be forced to go on a much stricter "pollution diet." That is because Maryland represents a much smaller fraction of the Susquehanna River watershed than of the total Chesapeake Bay watershed. Spreading the burden across the entire Bay watershed, rather than concentrating it in the Susquehanna River watershed, would increase the burden on Maryland more than 14-fold for nitrogen and about 18-fold for phosphorus.

As the Chesapeake Bay TMDL is a federal TMDL, all revisions to the Bay TMDL loads must be approved by EPA. MDE has no authority to make decisions regarding allocations among States or among watersheds. Neither Maryland nor any of the other Bay jurisdictions formally asked EPA to modify the 2010 Bay TMDL's allocations to adjust for the shortfall. And to date, EPA has not approved any revisions to the 2010 Bay TMDL's allocations based on the new calculation of needed reductions in the amounts of nitrogen and phosphorus.

Instead of asking EPA to reallocate nutrient reductions and run the risk of taking on additional burdensome obligations, MDE has now essentially "self-reallocated" the additional 6,000,000 pounds of nitrogen and 260,000 pounds of phosphorus to the tiny portion of the Susquehanna River basin located in Maryland, where the Conowingo Project is located, and then placed the burden on Exelon to remove those pollutants.

The Certification presented a convenient opportunity to shift the burden of pollution reduction from the States onto a private entity. The Conowingo Project, located in Maryland, was up for relicensing by FERC, so the Project's owner and operator, Exelon, needed to obtain a Section 401 certification from Maryland as a prerequisite to federal relicensing. The Certification uses this opportunity to impose billions of dollars of fees on Exelon.

Instead of awaiting EPA's determination on amended allocations for nitrogen and phosphorus and running the risk that Maryland would have to shoulder its fair share of the obligation for protecting the Bay, Maryland is now attempting to saddle Exelon with responsibility for the entire annual shortfall of 6-plus million pounds of pollutants, by making those reductions an express condition of Maryland's Section 401 certification.

J. Incorporation of the § 401 Certification into Exelon's Operating License

As set forth above, the Certification provides: "This is a final decision on the Application." Certification at 27. It also states: "Any request for an appeal does not stay the effectiveness of this Certification." *Id*. On May 8, 2018, MDE submitted the Certification to FERC. Exhibit B. Under the Clean Water Act, the conditions of a certification "shall become a condition on any Federal license or permit" to which the § 401 certification pertains. 33 U.S.C. § 1341(d).

Because MDE has purported to issue "a final decision" that is not stayed by an appeal, and has submitted the Certification to FERC, FERC could incorporate the Certification and its conditions into the Conowingo Project's federal license. Because, for reasons set forth below, the Certification is unreasonable and unlawful as a matter of federal and state law, is arbitrary and capricious, is not supported by substantial evidence, is an abuse of discretion, and violates the United States and Maryland Constitutions, Exelon respectfully petitions that MDE reconsider the

Certification. Exelon also requests that MDE reconsider whether the Certification will be stayed pending further reconsideration by MDE or judicial review, and grant such a stay.

III. GROUNDS FOR RECONSIDERATION

As set forth above, Exelon has not yet received MDE's complete administrative record or notice of the grounds upon which MDE purports to base its decision. The following grounds for reconsideration are therefore preliminary. Exelon expressly reserves the right to supplement and amend these grounds for reconsideration upon receipt of MDE's complete administrative record and notice of the factual and legal grounds upon which MDE purports to have based its decision.

A. Procedural Defects in the Certification.

1. MDE Has Violated Exelon's Statutory and Constitutional Rights by Issuing a "Final Decision" Without Affording Exelon Administrative Review, Including the "Contested Case" Hearing MDE Expressly Recognizes Is Available to Exelon.

In the Certification, MDE recognizes that Exelon is entitled to seek reconsideration, and MDE expressly provides that "[a]fter issuance of notice of the Department's decision on the request for reconsideration, a contested case hearing shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq., Annotated Code of Maryland." Certification at 27. Yet the Certification nevertheless purports to be a "final" decision, and MDE has already submitted it to FERC to become a condition on Exelon's federal license. MDE violated Exelon's statutory and constitutional rights by issuing a "final decision" ***before*** the "contested case" hearing that MDE recognizes "shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq." *Id.*; *see also* COMAR 26.08.02.10F(4)(b) (review "shall be in accordance with the applicable provisions of State

Government Article, §10-201 et seq., Annotated Code of Maryland," *i.e.*, the contested case procedures).

Under the State Government Article, a contested case hearing shall be conducted ***before*** an agency renders a "final decision," contrary to what MDE did here. *See*, *e.g.*, *State Bd. of Physicians v. Bernstein*, 167 Md. App. 714, 754 (2006) ("an agency's ***final decision*** can be made based on a record review of testimony and other evidence ***adduced at a contested case hearing***" (emphasis added)). The State Government Article provides that a "***final decision*** or order in a contested case that is adverse to a party shall be in writing or stated on the record." State Gov't Art. § 10-221(a) (emphasis added). Because a final decision or order must be based on the record developed in the contested case proceeding, there can be no final decision or order before the contested case proceeding has even begun. Likewise, the Article specifies that "if the final decision maker in a contested case has not personally presided over the hearing, ***the final decision may not be made*** until each party is given notice of the proposed decision … and an opportunity to" object, *id*. § 10-216(a)(1) (emphasis added) — again making clear that where a contested case hearing is available, there can be no final decision until after the contested case hearing has occurred. The judicial-review provisions further provide that "a party who is aggrieved by ***the final decision*** in a contested case is entitled to judicial review" — confirming that an agency decision is not final before the contested case hearing. *Id.* § 10-222(a)(1) (emphasis added). Indeed, MDE's purported issuance of a "final decision" ***before*** the contested case hearing effectively requires Exelon to seek judicial review of the final decision before the contested case hearing has occurred (or risk waiving judicial review) and deprives MDE of jurisdiction even to conduct the contested case hearing (and deprives Exelon of the hearing). *See* Maryland Rule 7-203(a) (requiring that "a petition for judicial review ***shall be filed*** within 30 days after the latest

of (1) the date of the order or action of which review is sought; [or] (2) the date the administrative agency sent notice of the order or action to the petitioner, if notice was required by law to be sent to the petitioner") (emphasis added); *Friends of Croom*, 2017 WL 1833206, at *2 ("petition for judicial review divests an administrative agency of jurisdiction").[2]

The nature of a contested case hearing confirms that, although MDE has claimed to issue a "final decision," Certification at 27, its action is ***not*** a valid final decision as a matter of state law. MDE's action is subject to a full evidentiary hearing before an agency factfinder who is free to issue an entirely different decision ***before*** an agency final decision is issued, all within the agency's administrative process. The contested case hearing may be conducted by an "agency head" or ***delegated*** by an agency head to other appropriate authority. State Government Article § 10-205(a)(1). Prior to the hearing, the hearing officer shall provide written notice of the hearing. *Id*. § 10-208. Each party — here, both Exelon and MDE — has the right to present evidence. *See id*. § 10-213(a)(1) ("Each party in a contested case shall offer all of the evidence that the party wishes to have made part of the record."); *id*. § 10-213(a)(2) ("If the agency has any evidence that the agency wishes to use in adjudicating the contested case, the agency shall make the evidence part of the record."). A party is entitled to call witnesses, cross-examine any witness that another party or the agency calls, and introduce documents. *Id*. § 10-213(f), (g). Numerous other procedural details are specified in the State Government Article, § 10-201, *et seq*.

Given these administrative proceedings that MDE has acknowledged still "shall be available in accordance with the applicable provisions of the State Government Article,"

[2] To the extent MDE's regulations purport to authorize the issuance of a final decision ***before*** the contested case hearing, those regulations are invalid. *See* State Government Article § 10-201 et seq.; *see McClanahan v. Washington Cty. Dep't of Soc. Servs.*, 445 Md. 691, 708 (2015) ("We will not … give effect to agency regulations that are inconsistent with or conflict with the statute the regulations are intended to implement." (quotation marks omitted)).

Certification at 27, it is clear that MDE has not yet issued a valid final decision as a matter of state law. The administrative record is obviously not yet complete. Witnesses may be called and cross-examined, and documents submitted. It remains to be seen what administrative decision ***will*** result, and indeed properly ***can*** result consistent with the evidentiary record that is yet to be created. At the end of the day, MDE cannot have it both ways: It cannot claim to have issued a final decision and to file that decision with FERC, while at the same time claiming that Exelon is still entitled to a full evidentiary hearing within the administrative process that — unless it is an entirely hollow exercise — will result in a new and different decision that is ***actually*** the agency's "final decision" under the statute.

Under State Government Article § 10-202(d)(2), contested case procedures apply — and a "final decision" cannot lawfully issue until the contested case hearing is complete — when an agency "regulation expressly, or by clear implication, requires the hearing to be held in accordance with this subtitle." Here, MDE's regulations do so. *See* COMAR 26.08.02.10(F)(4)(a) (identifying as applicable "State Government Article, §10-201 et seq., Annotated Code of Maryland").

In addition, under State Government Article § 10-202(d)(1), contested case procedures apply — and, again, a "final decision" cannot lawfully issue until the contested case hearing is complete — where the proceeding involves "the grant, denial, renewal, revocation, suspension, or amendment of a license," or "a right, duty, statutory entitlement, or privilege of a person that is required by statute ***or constitution***," "to be determined ***only after*** an opportunity for an agency hearing" (emphasis added). Here, procedural due-process rights under the Federal Constitution and the Maryland Declaration of Rights required a hearing before MDE could issue its decision as "final" and file it before FERC, which may, at any time, incorporate the Certification's conditions

into the Conowingo Project's federal license, thereby depriving Exelon of liberty and property by compelling Exelon to commit to undertake costly removal of nutrients for which Exelon is not responsible, or pay enormous sums of money. When the State is acting pursuant to "some established state procedure," due process generally "requires a predeprivation hearing before the State interferes with any liberty or property interest enjoyed by its citizens." *Parratt v. Taylor*, 451 U.S. 527, 537 (1981), *overruled in part on other grounds by Daniels v. Williams*, 474 U.S. 327 (1986).[3] The exception is if there is "either the necessity of quick action by the State or the impracticality of providing any meaningful predeprivation process." *Parratt*, 451 U.S. at 539; *United States v. James Daniel Good Real Prop.*, 510 U.S. 43, 53 (1993) ("We tolerate some exceptions to the general rule requiring predeprivation notice and hearing, but only in extraordinary situations where some valid governmental interest is at stake that justifies postponing the hearing until after the event." (quotation marks omitted)); *see also Roberts v. Total Health Care, Inc.*, 349 Md. 499, 510 (1998) (applying *James Daniel Good*'s rule to a claim under the Maryland Declaration of Rights).

Neither exception to the general requirement for a predeprivation hearing applies here. To the extent MDE deemed an immediate final action necessary because of the one-year deadline for issuing a 401 certification, *see* 33 U.S.C. § 1341(a), that cannot justify denying Exelon a predeprivation hearing — because the "necessity of quick action," *Parratt*, 451 U.S. at 537, was

[3] Exelon has myriad interests protected by due process: a protected property interest as the Conowingo Project's owner and in the Conowingo Project's economically beneficial use as a generation facility; a protected property interest in continuing to operate the Conowingo Project under State Permit No. 10-DP-0491; and a protected property interest in the Conowingo Project's 401 certification, as is required for the Conowingo Project's operating license. License applicants have rights protected by due process when they have "a legitimate claim of entitlement." *Bd. of Regents of State Colleges v. Roth*, 408 U.S. 564, 577 (1972). And here, the governing regulations provide that if MDE "determines the proposed activities will not cause a violation of applicable State water quality standards, the Department ***shall issue*** the water quality certification." COMAR 26.08.02.10(E)(1) (emphasis added). MDE has no discretion in the matter.

entirely due to MDE's own choices, which had a year to assess Exelon's most recent application (and extensive additional time prior to that). Nor can it be said that there is some "public health emergency [that] justifie[s] immediate action." *Id*. Whatever one's view of the environmental issues that the Certification seeks to address, they have arisen over many years and will take many years to resolve.

By issuing a "final decision" ***before*** the "contested case" hearing that MDE recognizes "shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq.," Certification at 27, MDE violated Exelon's statutory and constitutional rights. MDE accordingly should reconsider and stay its decision.

2. The Conditions in the Certification Are Invalid as a Matter of Law Because They Are Inherently Vague, Incomplete, Indefinite, and Expressly Subject to Further Analysis and Revision by MDE.

The Certification is also invalid because it purports to exercise a power that Maryland plainly lacks under the Clean Water Act. The Certification is replete with conditions that provide for continued planning, additional studies, reopening, and modification, making it a continuously evolving certification. Maryland essentially claims an unconstrained and unsupervised right to impose additional requirements on Exelon during the entire 50-year FERC license period. Most significantly, the Certification claims it can be reopened by MDE at any time to increase the already-onerous requirement that the Project remove more than six million pounds of nutrients from the water. Certification at 16. Similarly, MDE asserts it may modify ***any*** of the conditions with respect to an extensive list of legal or scientific changes, or simply because MDE concludes that "further conditions are necessary to assure compliance." *Id*. at 26. MDE clearly intends to exercise this authority over the entire license term. For example, it purports to be able to require

Exelon to submit improved fish protection plans for approval every five years until 2054. *See id.* at 22 (requiring submissions in "2024, 2029, 2034, 2039, 2044, 2049, and 2054").

These conditions are invalid, because they exceed Maryland's authority under CWA Section 401(a)(1) and Section 401(d). Under those provisions, States may impose conditions that are necessary to ensure compliance with state water-quality standards at the time of certification. A State's authority under CWA Section 401 is a threshold "gating" power that exists prior to, and in connection with, the issuance of a federal license. Under Section 401, a State is given 12 months to make its determination. After this period has expired, the State's authority under Section 401 comes to an end. *See Airport Communities Coalition v. Graves*, 280 F. Supp. 2d 1207, 1217 (W.D. Wash. 2003) (holding that state conditions issued outside the one-year window need not be incorporated into a federal license); *see also* 40 C.F.R. § 121.2(b) (EPA regulations prohibiting modification of a 401 certification without agreement from the licensing agency and EPA). Maryland has issued a certification that disregards this one-year limitation and asserts the right to alter the conditions at any point in the future. Nothing in the Clean Water Act grants the State an unlimited ability to make revisions to a 401 certification. As a result, MDE's certification conditions are invalid. The CWA allows Maryland to issue a certification with defined conditions, not a moving target that is yet to be determined.

B. The Certification Is Unlawful, *Ultra Vires*, and Contrary to Controlling Provisions of the Clean Water Act.

In numerous respects, the Certification is unlawful, *ultra vires*, and contrary to controlling provisions of the Clean Water Act, including but not limited to the following.

1. MDE Cannot Impose Conditions Relating to the Removal of Pollutants That Exelon Has Not Added to the River, and That Do Not Have Anything to Do with a "Discharge" That Can Be Regulated Under the Clean Water Act.

The Certification violates fundamental limits on the CWA, and MDE's certification authority under it.

Unlawfully requiring removal of pollutants. First, the CWA limits the introduction of pollutants into the navigable waters. *See South Florida Water Management Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95, 102 (2004); 33 U.S.C. § 1362(12)(A). It does not demand the removal of pollutants from the navigable waters. *Appalachian Power Co. v. Train*, 565 F.2d 1351, 1377 (4th Cir. 1976). The CWA is thus a pollution-control statute, not a pollution-cleanup statute. In enacting other environmental statutes, Congress has exercised its authority to require regulated parties to remove pollutants (or pay for the removal of pollutants) from navigable waters in circumstances not pertinent here — but it has not done so under Section 401 of the CWA. *E.g.*, Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9601 *et seq.* (imposing liability for and addressing cleanup of polluted and contaminated sites); Oil Pollution Act of 1990, 33 U.S.C. § 2701 *et seq*. (addressing cleanup of oil spills in waterways). The Certification violates this limit by requiring the removal of pollutants from the Susquehanna River.

Unlawfully imposing conditions that purport to regulate the Project's "discharge" of a pollutant. Under CWA § 401, the State may regulate the "discharge" of a dam. The term "discharge" is a defined term under the CWA, and includes the "discharge of a pollutant" or "pollutants," such as nitrogen or phosphorus. 33 U.S.C. § 1362(16). The term "discharge of a pollutant," in turn, is also a defined term, meaning "any ***addition*** of any pollutant to navigable waters." *Id.* § 1362(12) (emphasis added). Applying this definition, the Supreme Court held in

Los Angeles County Flood Control District v. Natural Resources Defense Council, 568 U.S. 78, 82 (2013), that "no pollutants are 'added' to a water body when water is merely transferred between different portions of that water body"; *see also id.* at 83 ("no discharge of pollutants occurs when water … simply flows from one portion of the water body to another"). Thus, a State cannot lawfully impose conditions under Section 401 relating to the discharge of pollutants that the licensee did not itself add to the waterbody.

Here, MDE violates that limit on its authority. Under the guise of regulating Exelon's "discharge" of water, it imposes onerous conditions relating to the discharge of pollutants (nitrogen and phosphorus) for which Exelon cannot lawfully be held responsible, because the Project's operation does not result in "any ***addition*** of any pollutant to navigable waters." 33 U.S.C. § 1362(12) (emphasis added); *see also National Wildlife Fed'n v. Gorsuch*, 693 F.2d 156, 174 (D.C. Cir. 1982) (approving EPA position that "the point or nonpoint character of pollution is established when the pollutant first enters navigable water, and does not change when the polluted water later passes through the dam from one body of navigable water (the reservoir) to another (the downstream river)"). It also cannot be said that it is the "activity" of Exelon that has resulted in the nutrient levels found in the Susquehanna River, *see* 33 U.S.C. § 1341(a)(1), or that MDE's conditions are "necessary" to assure that ***Exelon*** will comply with substantive provisions of the CWA or applicable requirements of Maryland law, *see id.* § 1341(d).

Exelon acknowledges that the Project's flowing water is a Section 401 discharge (although ***not*** a discharge of a pollutant), and that Maryland has authority under Section 401 to ensure that this discharge complies with requirements specified under Section 401(d). Restrictions on the discharge of water flow by a hydroelectric project can impact fish habitats, and a dam can restrict access to fish spawning grounds. That is the precise point of the Supreme Court decisions in *PUD*

No. 1 of Jefferson County v. Washington Department of Ecology, 511 U.S. 700 (1994), and *S.D. Warren Co. v. Maine Board of Environmental Protection*, 547 U.S. 370 (2006). To the extent the discharge itself may impact state requirements as to conditions such as flow, MDE can impose reasonable constraints on how the water is discharged. But MDE significantly exceeds that authority in the Certification, by requiring the removal of ***pollutants*** that Exelon did not add to the Susquehanna River.

2. The Certification Is Unlawful and *Ultra Vires* Because It Is Fundamentally Inconsistent with the Existing TMDL and Statutory Framework in the CWA for Addressing Water Quality in the Chesapeake Bay.

The Certification also is unlawful and *ultra vires* under the CWA for a separate reason. Again as set forth above, the Certification is inconsistent with the comprehensive Chesapeake Bay ecosystem-restoration plan that is administered by EPA. In 2010, based on detailed studies and computer modeling, EPA identified the "total maximum daily load" ("TMDL") required to implement the applicable water-quality standards for the Chesapeake Bay. 33 U.S.C. § 1313(d). Based on its computer models, EPA identified reductions in the amounts of nutrients (like nitrogen and phosphorus) reaching the Bay that would need to be achieved by 2025 to restore the health of the Bay. Consistent with the Clean Water Act, EPA focused on requiring reductions of the addition of those nutrients at the source, and then allocated these reductions equitably among the seven jurisdictions, including Maryland, that are responsible for the addition of nutrients into the waterways, including the Susquehanna River, that flow into the Bay. In 2017, at the mid-point of the 15-year target period between 2010 and 2025, newer computer models showed that EPA's original estimate of the amount of the reduction of nutrients needed to restore the health of the Bay was insufficient, and additional reductions were needed. EPA is in the process of determining how those additional reductions should be achieved. However, in the Certification, MDE has

determined that the entire amount of the additional reductions that are needed shall be Exelon's responsibility to remove from the Susquehanna River — rather than having EPA re-allocate those reductions among the same seven jurisdictions, ***including Maryland***, responsible for achieving EPA's nutrient reductions to restore the health of the Bay. Maryland lacks authority to commandeer EPA's comprehensive Chesapeake Bay ecosystem-restoration plan and shift nutrient-reduction responsibility from ***itself***, and other States, onto Exelon, simply because Exelon happens to be in the process of applying for a FERC operating license.

For similar reasons, MDE's actions are also conflict-preempted. Under the Supremacy Clause of the United States Constitution, a state action is preempted when it stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress. *Wyeth v. Levine*, 555 U.S. 555, 564 (2009). Here, the CWA gave EPA exclusive authority to allocate among the seven jurisdictions in the Chesapeake Bay watershed and the watershed's eight major river basins the amounts of nitrogen and phosphorus that each jurisdiction and basin may contribute to the Bay. The Certification is conflict-preempted because it invades and interferes with that exclusive authority — substituting MDE's judgment for EPA's by allocating to Exelon responsibility for all additional reductions of nitrogen and phosphorus.

3. Numerous Other Conditions in the Certification Are Unlawful and *Ultra Vires* Under CWA Section 401.

In numerous other respects, the Certification exceeds Maryland's authority under CWA Section 401.

Limitation to the "activity" of the "applicant." CWA § 401 provides that "any ***applicant*** for a Federal license or permit to conduct any ***activity … which may result in*** any discharge into the navigable waters" must provide a certification from the State in which the discharge originates that "any such discharge will comply" with applicable provisions of the Act. 33 U.S.C.

§ 1341(a)(1) (emphasis added). Similarly, Section 401(d) provides that such a certification may set forth limitations "***necessary*** to assure that any ***applicant*** for a Federal license or permit will comply" with substantive provisions of the CWA and other appropriate requirements of state law. *Id.* § 1341(d) (emphasis added). In numerous other respects (beyond the nutrient issue identified above), the Certification imposes conditions that are wholly unrelated to the "activity" of the applicant, and that are not "necessary to assure that [the] applicant" will comply with the CWA and applicable state law.

For instance, the Certification requires that Exelon employ clamming or other measures to remove floating and water-surface trash and debris at least weekly, and that in connection with such activity Exelon "***shall remove all visible trash and debris***." Certification at 17 (emphasis added). Yet it is undisputed that virtually all trash and debris in the Susquehanna River has nothing to do with the "activity" of the Conowingo Project, but rather is discarded by other persons along the 464-mile course of the river. This condition in the Certification therefore exceeds Maryland's authority under CWA Section 401. *See also Natural Resources Defense Council, Inc. v. EPA*, Civ. Action No. 16-1861 (JDB), − F. Supp. 3d −, 2018 WL 1568882, at *8 (D.D.C. March 30, 2018) (finding EPA action to be arbitrary, capricious, and not in accordance with law because, instead of setting a maximum daily amount of trash that could ***enter*** a river, EPA set a minimum amount of trash that must be ***removed***).

As other examples, the Certification also requires Exelon to prevent aquatic invasive species from moving ***upstream*** past the Project, Certification at Attachment 3; to study and potentially reduce Chlorophyll-A levels in the Maryland portion of the Reservoir, *id*. at 18; and to study and potentially reduce PCB levels in the Reservoir, *id*. at 19. None of these conditions has

anything to do with the "activity" of the Conowingo Project, and these and other similar conditions in the Certification exceed Maryland's authority under CWA Section 401.

Nonpoint sources of pollution. Section 401 addresses activities involving a point source that may result in a discharge to navigable waters. Section 401 does not govern nonpoint-source pollution. Yet Maryland has purported to impose obligations on Exelon under Section 401 to clean up pollution deposited in the Susquehanna River by nonpoint sources upstream of the Conowingo Project. *See, e.g.*, *Nat'l Wildlife Fed'n v. Gorsuch*, 693 F.2d 156, 175 (D.C. Cir. 1982); *Oregon Nat. Desert Ass'n v. U.S. Forest Serv.*, 550 F.3d 778, 785 (9th Cir. 2008).

Substantive limits on Section 401 certifications. Under Section 401(d), the only conditions that a State may impose through a 401 certification are "effluent limitations and other limitations, and monitoring requirements necessary to assure" that the applicant "will comply with any [1] applicable effluent limitations and other limitations, under [CWA Section 301 or 302], [2] standard or performance under [CWA Section 306], or [3] prohibition, effluent standard, or pretreatment standard under [CWA Section 307], and with any [4] other appropriate requirement of State law."

None of the Certification's conditions are "necessary" to assure that the Conowingo Project will comply with any of these provisions. There are no effluent limitations or other limitations under CWA Section 301 or 302 that apply to the Conowingo Project. There are no standards of performance under CWA Section 306 that apply to the Conowingo Project. There are no prohibitions, effluent standards, or pretreatment standards under CWA Section 307 that apply to the Conowingo Project. And as to "appropriate requirement[s] of State law," the Certification does not identify ***anything*** in Maryland law that authorizes the Certificate's conditions — much less an "appropriate requirement." Section 401 does not authorize a State, in the guise of issuing

a certification, to craft ***new*** purported requirements of state law; rather, the State must, at minimum, identify some preexisting requirement of state law that qualifies as an "appropriate requirement" under CWA Section 401.

4. The Enormous Annual "Payment of an In-Lieu Fee" in the Certification Is Unlawful Under CWA Section 401 and the Federal Power Act.

The Certification requires Exelon, beginning with calendar year 2025, to "annually reduce the amount of nitrogen included in the Project's discharges by six million (6,000,000) pounds and the amount of phosphorus in the Project's discharges by two hundred sixty thousand (260,000) pounds," or such different amounts as may be approved by MDE that "provide the equivalent protection of [Dissolved Oxygen] levels." Certification at 15. To achieve these amounts, Exelon must submit a "corrective action plan," which may propose any combination of corrective action strategies, including (a) payment of an "in-lieu fee annually" per pound of nitrogen and phosphorus; (b) installation of best management practices and/or ecosystem restoration actions; and/or (c) "Dredging the Reservoir." *Id*. at 16.

MDE fails to identify any set of "best management practices" or "ecosystem-restoration actions" that could achieve the massive reductions of nitrogen and phosphorus required in the Certification. And MDE ***itself*** has acknowledged that dredging would be "cost prohibitive and ineffective." FERC, *Final Multi-Project Environmental Impact Statement for Hydropower Licenses* at 139 (2015) (discussing MDE's LSRWA study). To dredge the required amounts, Exelon would need to remove 25 football fields of sediment to a depth of 67.5 feet every year, and would then need to deposit the dredged sediment somewhere else. Dredging and disposing of this much sediment is not feasible, and would itself cause environmental harm. In reality, MDE expects Exelon to make the annual "in-lieu fee" alternative compliance payment, which would

amount to more than ***$7 billion*** over the course of the license, or approximately $500,000 ***every day*** over 40-plus years. This amount exceeds, by orders of magnitude, the economic value of the Conowingo Project as an operating asset.

Section 401 of the CWA does not authorize Maryland to impose such a massive financial obligation on Exelon. The provision allows a State to provide, or to decline to provide, "a certification … that any such discharge ***will comply with the applicable provisions of [CWA] sections 301, 302, 303, 306 and 307 of this Act***" — not to impose independent financial obligations on federal licensees or to facilitate other parties' compliance with the Clean Water Act. 33 U.S.C. § 1341(a)(1) (emphasis added); *see also id.* § 1341(d) (authorizing the State to impose limitations "to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations" or other CWA limitations, "and with any other appropriate requirement of State law"). FERC has expressed the view that water-quality conditions that impose a monetary penalty on a licensee violate the Federal Power Act ("FPA") once implemented in the federal license, because the FPA establishes a different procedure for sanctioning a licensee's noncompliance. *See*, *e.g.*, *Consumers Powers Co.*, 68 FERC ¶ 61,077, at P 61,380 (1994) (refusing to incorporate condition requiring licensee to pay state agency liquidated damages for noncompliance); *Settlements in Hydropower Licensing Proceedings Under Part I of the Federal Power Act*, 116 FERC ¶ 61,270 at P 62,087 (2006) ("[B]ecause the FPA does not allow the Commission to impose damages, a damages provision may not properly be included in a license.").

The staggering financial obligation that MDE effectively requires in the Certification, given the impracticability and harmful effects of dredging, exceeds Maryland's authority under Section 401 and is unlawful under the CWA and FPA.

C. The Certification Is Unlawful as a Matter of State Law.

The Certification also cannot stand as a matter of state law, including the requirements for rational and adequately reasoned agency decision-making, supported by sufficient evidence.

1. The Certification Is Unlawful as a Matter of State Law in Imposing Obligations on Exelon That Are Unrelated to Exelon's Own Activities.

The conditions identified above as beyond the State's authority under the CWA — including the Certification's nutrient-reduction provisions, trash and debris removal provisions, and invasive fish species, Chlorophyll-A, and PCB requirements — also are unlawful as a matter of state law. Fundamentally, MDE's own regulations provide, with regard to a water quality certification, that "[i]f the Department determines ***the proposed activities*** will not ***cause*** a violation of applicable State water quality standards, the Department shall issue the water quality certification." COMAR 26.08.02.10(E)(1) (emphasis added). Maryland's own regulations thus confirm that the State may not require an applicant to cleanse water polluted by others. For the reasons set forth above, it is clear that Exelon's "proposed activities" are not the "cause" of the water-quality conditions that MDE seeks to address. Exelon did not deposit the nutrients, trash, invasive fish, Chlorophyll-A, or PCBs into the Susquehanna River, and it is a violation of MDE's own regulations to require Exelon to remove those items from the water as a condition of receiving a water-quality certification.

MDE's attempt to hold Exelon responsible for conditions that it did not cause not only violates the controlling regulation, but renders MDE's decision arbitrary and capricious. In considering the lawfulness of agency actions, the Court of Appeals in *Maryland Department of Environment v. Anacostia Riverkeeper*, 134 A.3d 892, 911-12 (Md. 2016), adopted the standards for agency decision-making set forth in *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Automobile Ins. Co.,* 463 U.S. 29, 43 (1983) — which the Court of Appeals described as the

"leading case on the arbitrary and capricious standard." 134 A.3d at 911. Thus, a fundamental principle of both federal and Maryland administrative law is that agency action is arbitrary and capricious when the agency fails to articulate a "rational connection between the facts found and the choice made." *State Farm*, 463 U.S. at 43 (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)); *see Anacostia Riverkeeper*, 134 A.3d at 911 (stating that this requirement is "in accord with Maryland's treatment of this standard").

An agency fails to articulate a "rational connection between the facts found and the choice made," *State Farm*, 463 U.S. at 43, when it holds a party responsible for conditions that it did not cause; rather, when an agency issues a license or permit, any conditions attached to the license or permit must be connected to the activity being authorized. Thus, in *Wisconsin Valley Improvement v. FERC*, 236 F.3d 738 (D.C. Cir. 2001), the D.C. Circuit determined that a FERC-imposed condition on the license of a hydropower facility, which required the facility to undertake a crop-enhancement plan, was not arbitrary and capricious only because it sought to remediate crop damage that was directly connected to the hydropower facility's operation. *Id.* at 747. Although this was a federal-law decision, Maryland follows the same administrative-law principles. *Anacostia Riverkeeper*, 134 A.3d at 911.

In contrast, MDE cannot impose obligations on Exelon based on circumstances beyond Exelon's control. In *American Iron & Steel Institute v. EPA*, 526 F.2d 1027 (1975), the court explained this principle in holding that EPA could not impose effluent limitations on dischargers of water without adjusting the limitations for pollution already in the water, because otherwise the party subject to the limitations "would be forced to clean up water that had already been polluted by other companies." *Id.* at 1056. Indeed, "[s]uch an adjustment would seem required by due process, since without it a plant could be subjected to heavy penalties because of circumstances

beyond its control." *Id.*; *see also FMC Corp. v. Train*, 539 F.2d 973, 986 (4th Cir. 1976) (concluding that it was arbitrary for EPA to impose penalties for exceedances of water-pollution regulations that were beyond the control of the water treatment facility); *cf. Union P. R. Co. v. DHS*, 738 F.3d 885, 893-94 (8th Cir. 2013) ("Neither our court nor the Supreme Court has ever sanctioned [an administrative] scheme" that would "punish innocent [property] owners for 'the misconduct of mere strangers, over whom such owners or [the owners'] consignees could have no control.'" (quoting *Peisch v. Ware*, 8 U.S. (4 Cranch) 347, 365 (1808)). By the same logic, MDE cannot require that Exelon "clean up water that had already been polluted by other companies," *American Iron*, 526 F.2d at 1056, over the Susquehanna's 464-mile course.

2. MDE Failed to Explain and Provide an Adequate Basis for the Agency's Dramatic Shift from Previous Certifications and Permits It Has Issued for the Project, as Recently as 2014.

As set forth above, MDE consistently has issued certifications and permits for the Conowingo Project, without the onerous conditions included in the Certification. Yet the operation of the Project has not changed. The agency has wholly failed to explain or provide an adequate basis for this dramatic change in position.

The State's longstanding position has been that the operation of the Conowingo Project does ***not*** violate state water-quality standards. Consistent with that position, the State issued a certification for operation of the Conowingo Project in 1975, and subsequently during each NPDES permit renewal, including the most recent renewal in 2014. *See* COMAR 26.08.02.10(A)(2) ("Discharges permitted by the Department under the National Pollutant Discharge Elimination System are certified by the Department."). These prior 401 certifications stated that compliance with the NPDES permit will "insure that the operation of the facility will comply with appropriate requirements of State law," and thus only required that the Conowingo Project comply with the

limited effluent limitations and monitoring requirements that are set forth in State Permit No. 10-DP-0491. In addition, State Permit No. 10-DP-0491 acknowledges that the requirements therein are consistent with the Chesapeake Bay TMDL for sediments, nitrogen, and phosphorus, approved December 29, 2010.

MDE is not entitled to make such an abrupt departure from its prior practice without a reasoned basis and explanation. The Court of Appeals recently explained the applicable principles in *Frederick Classical Charter School, Inc. v. Frederick County Board of Education*, 454 Md. 330, 406-07 (2017). Generally, administrative agencies are afforded "ample latitude to adapt their rules and policies to the demands of changing circumstances." *Montgomery Cty. v. Anastasi*, 77 Md. App. 126, 137 (1988) (quoting *State Farm*, 463 U.S. at 42). However, an administrative agency decision "may be deemed 'arbitrary or capricious' if it is contrary to or inconsistent with an enabling statute's language or policy goals" or "if it is irrationally inconsistent with previous agency decisions." *Harvey v. Marshall*, 389 Md. 243, 302-03 (2005); *see also Mesbahi v. Md. State Bd. of Physicians*, 201 Md. App. 315, 331-32 (2011) (holding that an administrative agency "was not free to ignore its prior policy statement[]" in a prior declaratory ruling, and concluding that the agency "gave the appropriate weight" to its prior ruling by treating it as "akin to a precedential adjudicatory ruling"); *Dillmon v. Nat'l Transp. Safety Bd.*, 588 F.3d 1085, 1090-91 (D.C. Cir. 2009). Thus, when an agency changes a position clearly established in its own prior precedent, it "must supply a reasoned analysis indicating that prior policies and standards are being deliberately changed, not casually ignored." *Anastasi*, 77 Md. App. at 137 (quoting *Local 32, Am. Fed'n of Gov't Employees, AFL–CIO v. Fed. Labor Relations Auth.*, 774 F.2d 498, 502 (D.C. Cir. 1985)).

Here, MDE provided no such "reasoned analysis" identifying or explaining why the operation of the Project has changed, and accordingly the Certification should be reconsidered. *See Wisconsin Valley Improvement*, 236 F.3d at 748 (rejecting as arbitrary and capricious FERC's attempt to impose usage fees as a condition of a hydropower facility's license, because FERC "offered no explanation — far less a 'reasoned' one — for [the agency's] abrupt departure" from its prior practice of not imposing such fees).

3. The Annual "Payment of an In-Lieu Fee" in the Certification Is an Impermissible Tax.

The enormous annual "in-lieu fee" in the Certification, described above, also is unlawful as a matter of state law as an impermissible tax on Exelon. MDE has "no general taxing authority"; it can only impose fees incident to valid regulatory measures. *Accokeek, Mattawoman, Piscataway Creeks Cmty. Council, Inc. v. Pub. Serv. Comm'n of Maryland*, 451 Md. 1, 16 (2016). While there "is no set rule by which it can be determined" whether a charge is a permissible regulatory fee or an impermissible tax, a tax's hallmark is that it is imposed "for the purpose of raising revenue"; by contrast, a charge is a fee when it is "based solely on the service provided to the" regulated party, when it "defray[s] the expenses of the regulatory process," or when the charge offsets "any negative impact" of the regulated party's activities. *Id.* at 17. In *Accokeek*, for example, a charge imposed in a permit to build a new fossil-fuel electric-generating station was a permissible regulatory fee because it addressed the "negative impact" of the station's activities — for example, its proceeds would help "offset the impact of the emission of pollutants from the … station." *Id.* at 18. Here, by contrast, the $172 million annual charge is imposed on Exelon purportedly to address pollution that Exelon did not create, and there is nothing in the Certification even to require that its proceeds go to ***counteract*** this pollution. MDE is merely trying to "rais[e] revenue" from Exelon via an unlawful condition in the Certification. *Id.* at 17.

Even if the Certification were deemed to impose a regulatory fee, moreover, it would be an unlawful fee. For a regulatory fee, "the amount of money to be collected under it" must be "reasonable." *Mayor & City Council of Ocean City v. Purnell-Jarvis, Ltd.*, 86 Md. App. 390, 406 (1991). Here, the Certification's charges are not reasonable because they are not based on any harm caused by Exelon or the Conowingo Project. *Id.*

4. Other Findings, Numerical Values, and Obligations in the Certification Are Arbitrary and Capricious, Not Supported by Substantial Evidence, and Constitute an Abuse of Discretion.

There are numerous other findings, numerical values, and obligations in the Certification for which no foundation is provided by MDE, and for which there is no reference to adequate evidence in the record. Exelon has not yet been provided with MDE's administrative record. Exelon reserves the right to supplement and amend this Petition upon receipt of the administrative record, and to contend that other findings, numerical values, and obligations in the Certification are arbitrary and capricious, not supported by substantive evidence, and constitute an abuse of discretion. *See Anacostia Riverkeeper*, 134 A.3d at 911-12.

Specifically, Exelon contends that the following findings, numerical values, and obligations in the Certification, among others, are arbitrary and capricious, not supported by substantive evidence, and constitute an abuse of discretion:

Dissolved Oxygen and Nutrients. There is no rational basis or sufficient evidence in the record to support the obligations in the Certification that the Project achieve annual nutrient reductions of 6,000,000 pounds of nitrogen and 260,000 pounds of phosphorus. Certification at 15. MDE has not identified any effective and reasonable means of achieving this massive nutrient removal at the Conowingo Project, which is downstream from the sources of these pollutants. Indeed, the Certification neither identifies any such means nor provides a basis for imposing

nutrient reductions on Exelon rather than the sources of those nutrients. Instead, MDE requires payment from Exelon in excess of $172 million annually, the installation of best management practices and/or ecosystem restoration actions, and/or dredging of the Reservoir, while failing to address the pollution at its source.

Trash and Debris. There is no rational basis or sufficient evidence in the record to support the obligations in the Certification that the Project remove "all" trash and debris by, among other things, using a self-propelled skimmer barge on a daily basis, removing all visible trash and debris at least 40 times per year, and performing a study regarding the feasibility of using one or more water-wheel trash interceptors powered by solar panels or other renewable sources. Certification at 17. Natural debris such as logs and vegetation, and artificial debris such as tires, metal, and plastic containers, accumulate at the Conowingo Project from upstream, and Exelon has a practice of collecting and removing a reasonable portion of such debris. The Conowingo Project's practices "are similar to, and consistent with, the typical best management practices of other hydroelectric facilities." *Final Study Report: Debris Management Study*, at 14 (Conowingo RSP 3.14). There is no evidence in the record demonstrating that the Project is the source of the trash and debris. Instead, these conditions impermissibly make Exelon responsible for trash and debris generated by other parties in Pennsylvania, New York, and other locations along the 464-mile long stretch of the Susquehanna River.

Fish Passage. There is no rational basis or sufficient evidence in the record to support the obligations in the Certification regarding fish passage that go beyond the requirements set forth in the fish-passage settlement with the Department of the Interior, would increase the likelihood that invasive species can migrate upstream through the dam, and include, among other things, goals of 5 million shad and 12 million herring passing each year. Certification at 13 and Attachment 3.

There is no evidence in the record demonstrating that the Project causes or contributes to the fish population declines asserted by MDE or to the presence of aquatic invasive species. Instead, these requirements set forth unrealistic goals that exceed historically reported populations and impermissibly fail to consider the science regarding the variety of causes of fish decline and the cause of the presence of invasive species. The record shows that the Project supports a diverse assemblage of fishes and a healthy multi-species sport fishery supported by natural reproduction.

The Certification is also inconsistent with the data-driven approach of the fish passage settlement with the Department of the Interior, which requires Exelon to make improvements only when the Department of the Interior determines them to be necessary based on data. By contrast, the Certification's fish passage conditions impose construction obligations, ***whether or not*** shown to be necessary based on data. They also assert MDE's authority to issue certain approvals that are within Department of the Interior authority under the Department of the Interior settlement agreement, such as approvals of changes to a Fishway Operation and Maintenance Plan.

Chlorophyll-A. There is no rational basis or sufficient evidence in the record to support the obligations in the Certification regarding Chlorophyll-A. Certification at 18.

PCB Levels in Fish Tissue. There is no rational basis or sufficient evidence in the record to support the obligations in the Certification regarding PCB levels in fish tissue. Certification at 19.

Oversight Costs. There is no rational basis or sufficient evidence in the record to support the obligations in the Certification requiring the Project to pay up to $250,000 per year in oversight costs to both MDE and to the Maryland Department of Natural Resources. Certification at 27. This condition is not authorized by the Clean Water Act or state law.

D. The Obligations in the Certification Constitute a Taking Without Just Compensation, and Violate Exelon's Due Process and Equal Protection Rights, in Violation of the Federal Constitution and the Maryland Declaration of Rights.

Imposing enormous obligations on Exelon to remove pollutants and trash deposited by countless others along the river's 464-mile course is also fundamentally unfair and violates Exelon's constitutional rights. The Takings Clause of the Fifth Amendment provides that "private property shall not be taken for public use without just compensation." U.S. Const. amdt. 5. The Clause's purpose is to prevent the government "from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960). The Maryland Constitution protects the same principle. *See Neifert v. Dep't of Env't*, 395 Md. 486, 518 (2006).

The government need not physically appropriate private property for its own use to effect an unconstitutional taking; economically burdensome government regulation can constitute a taking as well. *See*, *e.g.*, *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 538 (2005). And "land" need not be taken; an unreasonable financial burden is also actionable. *Eastern Enterprises v. Apfel*, 524 U.S. 498, 522-23 (1998) (plurality op.). To evaluate whether economically injurious government action is an unconstitutional taking, courts must examine the "justice and fairness" of the governmental action, guided by consideration of "the economic impact of the regulation, its interference with reasonable investment backed expectations, and the character of the governmental action." *Id*. at 523-24.

The ultimate economic impact of Certification will be, at a minimum, $172,200,000 annually (the amount of the "in-lieu fee"), for a total amount of more than $7 billion over the term of the license. This fee is more than "substantial." *See*, *e.g.*, *id.* at 529 (finding that required "cumulative payments" under legislation "on the order of $50 to $100 million" were "substantial");

Connolly v. Pension Ben. Guar. Corp., 475 U.S. 211, 222 (1985) (observing that liability under legislation, in the amount of "approximately $200,000," could not "be considered insubstantial"). As stated above, this amount exceeds, by orders of magnitude, the economic value of the Conowingo Project as an operating asset.

The retroactive nature of the Certification interferes with Exelon's reasonable investment-backed expectations. *See Eastern Enterprises*, 524 U.S. at 532-34 (plurality op.). The Certification's economic impact is as substantial as it is because MDE has attempted to use the Certification as a vehicle for removing from the Susquehanna River massive amounts of nutrients from the upstream agricultural runoff that has flowed into the river. The problem of agricultural runoff from Pennsylvania and New York polluting the Susquehanna is at least as old as the Reservoir. And despite the Reservoir's existence for 90-plus years — during which time it helped keep the Bay clean by trapping upstream pollutants — the Project's right to operate has never before been conditioned on an obligation to clean up after all upstream polluters.

An unconstitutional taking of property without compensation also exists here because MDE's Certification belongs in a class of one: No other 401 certification (of which Maryland has issued many) has required a hydroelectric licensee to cover the full costs of removing from the river pollutants caused not by the licensee's activities, but by upstream polluters. Nor has any other State attempted, through CWA Section 401, to extract annual "fees" of hundreds of millions of dollars from the licensee for some unspecified purpose. The "unusual" character of MDE's Certification "implicates fundamental principles of fairness underlying the Takings Clause." *Eastern Enterprises*, 524 U.S. at 537.

By shifting the costs for removing pollutants flowing into the Reservoir onto the Project, the Certification has shifted the public burden for the regulatory challenge posed by agricultural

runoff onto the Project alone. The Certification is a perfect embodiment of what the Takings Clause prohibits.

Viewed under another but similar lens, the Fifth and Fourteenth Amendment Due Process Clauses provide protection from economically burdensome regulations that are "arbitrary and irrational." *Usery v. Turner Elkhorn Mining Co.*, 428 U.S. 1, 15 (1976); *see Eastern Enterprises*, 524 U.S. at 547 (Kennedy, J., concurring in the judgment and dissenting in part). "[A] regulation that fails to serve any legitimate governmental objective may be so arbitrary and irrational that it runs afoul of the Due Process Clause." *Lingle*, 544 U.S. at 543.

The governmental objective that the Certification purports to serve is the reduction of nutrients in the Susquehanna River. But none of the MDE's proposed methods for doing so are directed towards regulating the true sources of the pollution. By imposing on Exelon the astronomical cost of removing upstream pollutants from the Susquehanna River, MDE has acted so arbitrarily and irrationally as to deprive Exelon of substantive due process.

For similar reasons, the Certification violates equal protection. Equal protection is violated when "the plaintiff … has been intentionally treated differently from others similarly situated and that there is no rational basis for the difference in treatment." *Village of Willowbrook v. Olech*, 528 U.S. 562, 564 (2000). That remains true where, as here, the discrimination is against a "class of one." *Id.* Here, the Certification intentionally, and without rational basis, discriminates against Exelon by attempting to extract a $172 million annual payment from Exelon; by holding Exelon responsible for pollution caused by parties other than Exelon, which occurs upstream of the Conowingo Project throughout Pennsylvania and New York; and by imposing on Exelon other obligations that are costly, onerous, and have no relationship to the operation of the Conowingo

Project, thereby treating Exelon differently from similarly situated regulated properties in a manner having no rational relationship to a legitimate interest.

E. The Certification Unlawfully Discriminates Against Federally Licensed Dams.

Under the Supremacy Clause of the United States Constitution, States are not permitted to discriminate against the Federal Government or the private entities with whom the Federal Government deals. U.S. Const. art. VI, cl. 2. As the owner and operator of the Conowingo Project, Exelon is a licensee of the Federal Government. The Certification discriminates against Exelon because it imposes stricter conditions related to water-quality standards on Exelon at the Conowingo Dam than it imposes on State-licensed dams and therefore treats these dams preferentially to the federal licensee.

IV. RELIEF REQUESTED

The Certification is unlawful, arbitrary and capricious, not supported by substantial evidence, an abuse of discretion, and unconstitutional. Exelon requests that MDE reconsider its decision and remove all conditions that are unauthorized by Federal or Maryland law, arbitrary and capricious, not supported by substantial evidence, an abuse of discretion, and unconstitutional. Exelon further requests that MDE stay the Certification and inform FERC that it should not act upon the Certification while reconsideration and judicial review are pending.

Dated: May 25, 2018

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EXHIBIT LIST
Protective Petition for Reconsideration and Administrative Appeal
May 25, 2018

Exhibit	**Alpha Label**
April 27, 2018 Maryland Department of the Environment, Clean Water Act Section 401 Certification for the Conowingo Hydroelectric Project	A
May 8, 2018 Letter from MDE Secretary B. Grumbles to FERC Secretary K. Bose, submitting Maryland Department of the Environment's Certification	B
Exelon Generation Co. v. Maryland Dept. of Environment, Circuit Court for Baltimore City, Complaint for Declaratory and Injunctive Relief, and in the Alternative, Petition for Judicial Review and Complaint for Mandamus	C
Exelon Generation Co. v. Benjamin H. Grumbles and D. Lee Currey, United States District Court for the District of Columbia, Complaint	D
1975 Maryland State Certification	E
Maryland State Permit 10-DP-0491	F

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

Certification Issued To:

Exelon Generation Company, LLC
300 Exelon Way
Kennett Square, PA 19348

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Attachments:

1. MDE Fish Passage Improvement Plan

   Appendix A – Calculation of Fishway Capacity for a 6,500 Gallon Hopper
   Appendix B – Calculating Trap and Transport Credit
   Appendix C – Trap and Transport Mortality Study
   Appendix D – Upstream and Downstream Migration Periods for Certain Species
   Appendix E – Diagram of Fish Passage Definitions

2. MDE Eel Passage Improvement Plan

3. MDE Invasive Species Mitigation Plan

4. Minimum Flow Regime

5. Year 10 Flow Regime

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1. Authority

This Certification is issued to Exelon Generation Company, LLC (the "Licensee") by the Maryland Department of the Environment ("MDE" or the "Department") pursuant to Section 401 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §1341 et seq. (the "Clean Water Act"), Title 9, Subtitle 3 of the Environment Article, and Section 26.08.02 of the Code of Maryland Regulations ("COMAR"), with respect to the Conowingo Hydroelectric Project, FERC Project Number P-405 (the "Project").

2. Definitions and Administrative Provisions

A. Definitions

In addition to terms defined elsewhere in this Certification, the following terms have the following meaning when used in this Certification and the Attachments hereto:

"Application" means that certain Application for a Maryland Water Quality Certificate for the Conowingo Hydroelectric Project submitted to the Department by the Licensee with respect to the Project on May 17, 2017, as amended, supplement, or modified.

"Authorization" means any applicable license, permit, approval, consent, exemption or authorization from a federal, State or local governmental authority.

"Bay" means the Chesapeake Bay and its tidal tributaries.

"cfs" means cubic feet per second.

"CPI" means the Consumer Price Index for All Urban Consumers (CPI-U; U.S. City Average; all items, not seasonally adjusted; 1982-84=100 reference base) published from time to time by the U.S. Bureau of Labor Statistics.

"Dam" means the Conowingo Dam, as described in Section 1.1 of the FERC Application.

"DNR" means the Maryland Department of Natural Resources.

"DO" means dissolved oxygen.

"DO Non-Attainment Area" means the portion of the Bay consisting of Chesapeake Bay segments CB4MH (Middle Central Chesapeake Bay Mesohaline deep water and deep channel) and the Maryland portion of CB5MH (Lower Central Chesapeake Bay Mesohaline deep water).

"DOI" means the United States Department of the Interior.

"EAV" means emergent aquatic vegetation.

"Eel" means American eel (*Anguilla rostrata*).

"East Fish Lift" or "EFL" means the east fish lift at the Project.

"Environment Article" means the Environment Article of the Annotated Code of Maryland.

"FERC" means the Federal Energy Regulatory Commission.

"FERC Application" means that certain Application for New License for Major Water Power Project-Existing Dam submitted to FERC by the Licensee with respect to the Project on or about August 9, 2012, as amended, supplemented, or modified.

"Herring" means, interchangeably and collectively, alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*).

"Holtwood" means the Holtwood Hydroelectric Project, FERC Project Number 1881.

"Laws" means applicable laws, statutes, regulations, rules, administrative orders, and judicial orders.

"Lower River" means the River from the Dam to its confluence with the Bay.

"Marietta Gage" means the water stage gage located on the River approximately one mile downstream of Marietta, Pennsylvania, USGS station #01576000.

"MDE-AEPIP" means the MDE American Eel Passage Improvement Plan, set forth in Attachment #2 to this Certification, which is incorporated herein by reference.

"MDE-FPIP" means the MDE Fish Passage Improvement Plan, set forth in Attachment #1 to this Certification, which is incorporated herein by reference.

"MDE-ISMP" means the MDE Invasive Species Mitigation Plan, set forth in Attachment #3 to this Certification, which is incorporated herein by reference.

"Minimum Flow Regime" means the operational flow requirements set forth in Attachment #4 to this Certification, which is incorporated herein by reference.

"Muddy Run" means the Muddy Run Pumped Storage Project, FERC Project Number 2355.

"New License" means the license for the Project to be issued by FERC.

"NMFS" means the National Marine Fisheries Service.

"Peach Bottom" means the Peach Bottom Atomic Power Station.

"PCBs" means polychlorinated biphenyls.

"ppt" means parts per thousand.

"Reservoir" means the water impounded by the Dam, which is sometimes referred to as the Conowingo Pond or Conowingo Pool.

"River" means the Susquehanna River.

"Safe Harbor" means the Safe Harbor Hydroelectric Project, FERC Project Number 1025.

"SAV" means submerged aquatic vegetation.

"Secretary" means the Secretary of the Environment of the State of Maryland, and any successor thereto.

"Shad" means American shad (*Alosa sapidissima*).

"Shoreline Management Plan" or "SMP" means the Licensee's Shoreline Management Plan dated August 2012, included the Application and in Volume 3 of the FERC Application, which is incorporated herein by reference.

"Station 643" means DO and temperature monitoring station 643, located approximately 0.6 miles downstream of the Dam, which was established at such location by the Licensee in consultation with DNR.

"Sturgeon" means Atlantic and shortnose sturgeon (*Acipenser brevirostrum, Acipenser oxyrinchus oxyrinchus*).

"Tailrace" means the area downstream of the Dam that is in the hydraulic influence of Project operations.

"Tailwaters" means the Tailrace, extending to the downstream tip of Rowland Island.

"Term" means the term of the New License.

"TMDL" means a total maximum daily load for a body of water, pursuant to the Clean Water Act.

"USFWS" means the United States Fish and Wildlife Service.

"West Fish Lift" or "WFL" means the west fish lift at the Project.

"Year 10 Flow Regime" means the operational flow requirements set forth in Attachment #5 to this Certification, which is incorporated herein by reference.

"WQS" means applicable Maryland water quality standards.

B. Construction and Interpretation

All references herein to Sections or Attachments are references to Sections of or Attachments to this Certification, unless otherwise indicated. All Attachments to this Certification are deemed to be incorporated by reference and made a part of this Certification. All documents incorporated by reference into this Certification that are not attached hereto are qualified by the provisions, requirements and conditions of this Certification. Whenever the words "include," "includes," or "including" are used in this Certification, they shall be deemed to be followed by the words "without limitation." Every reference herein to any Law shall be deemed to be a reference to such Law as it may be amended, supplemented, modified, renumbered, or re-codified from time to time. The Table of Contents and Section headings contained in this Certification (including the Attachments hereto and documents incorporated herein by reference) are for convenience only and shall not in any way affect the meaning or interpretation of this Certification. All references herein to temperatures are expressed in degrees Fahrenheit, unless otherwise noted. All references herein to "days" are calendar days unless otherwise noted. All references herein to governmental entities are to such governmental entities and any successor(s) thereto.

C. Plans

Where the Licensee is required by this Certificate (including any Attachment hereto) to submit to MDE for review and approval any plans, reports, or other documents, including the NCAP (defined below), the 643 Monitoring Plan (defined below), the Fish Kill Monitoring Plan (defined below), the Chlorophyll-A Monitoring Plan (defined below), the Chlorophyll-A Reduction Plan (defined below), the SMP Updates (defined below), the Bog Turtle Plan (defined below), the Map Turtle Plan (defined below), the Waterfowl Plan (defined below), the Tailrace Gage Plan (defined below), the Sturgeon Plan (defined below), the HIP Plan (defined below), the Fish Protection Plan (defined below), the FPP Updates (defined below), and the Stranding Minimization Plan (defined below) (each, a "Plan"), the following procedures shall apply, unless otherwise specified in this Certification:

i. MDE may approve any Plan, in whole or in part, or decline to approve it and provide written comments. MDE may also request additional information. The Licensee shall consult with MDE at least thirty (30) days prior to submission of any Plan about the subject matter thereof. To be effective, any approval by MDE hereunder must be provided in writing.

ii. MDE may solicit public comments and may hold, or require the Licensee to hold, one or more public hearings or meetings with respect to any Plan submitted by the Licensee. MDE may consult and share relevant information with, and may require the Licensee to consult and share relevant information with, other governmental entities or third parties having particular expertise in connection with the review, implementation, and/or oversight of any Plan, including DNR, USFWS, NMFS, the Susquehanna River Basin Commission and the Eel Passage Advisory Group. In connection with each proposed Plan, the Licensee shall provide MDE with (a) documentation regarding consultation with other governmental entities and third parties, (b) an explanation of how the proposed Plan addresses comments or recommendations from governmental entities or third parties, and (c) an explanation of why any such comments or recommendations are not addressed in the proposed Plan.

iii. Upon approval by MDE in writing, the Plan is incorporated into this Certification, and Licensee shall comply with such Plan as approved by MDE. Any failure to comply with an approved Plan, including any deadlines set forth therein, shall be deemed noncompliance with this Certification.

iv. In the event of MDE's disapproval, in whole or in part, of any Plan, MDE shall specify any deficiencies in writing to the Licensee. The Licensee shall correct the deficiencies within thirty (30) days from receipt of disapproval by MDE unless MDE grants an extension, and submit the corrected Plan to MDE for review.

v. If the Licensee takes exception to all or part of MDE's disapproval of any Plan, the Licensee shall submit a written statement of the grounds for the exception to MDE within fifteen (15) days from receipt of disapproval by MDE. Representatives of MDE and the Licensee may confer in person or by telephone in an attempt to resolve any disagreement. If a resolution is reached, that resolution shall be reduced to writing and signed by representatives of each party. In the event that resolution is not reached within fifteen (15) days, unless MDE grants an extension, the Licensee shall modify the Plan as required by MDE.

vi. Each Plan shall include (a) periodic reporting by the Licensee to MDE at such intervals as MDE deems reasonably necessary; and (b) a timeline for implementation of the Plan.

vii. The Licensee shall (a) provide all data and reports, including monitoring results, collected or developed pursuant to any Plan to MDE in electronic format, (b) make all such data and reports publically available on the Web Portal (defined below), (c) make all Plans publicly available on the Web Portal contemporaneously with submission thereof to MDE, and (d) make all approved Plans publicly available on the Web Portal upon receiving approval thereof from MDE.

viii. To the extent any Plan requires sampling, the number of samples, techniques used to obtain samples, and sampling locations shall be subject to approval by MDE.

3. Certification

The Department hereby certifies that the Project's operations and discharge into navigable waters will comply with applicable effluent limitations, other limitations, and water quality standards and requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State Law, provided that Licensee complies with all of the provisions, requirements, and conditions in this Certification.

4. Summary Project Description

The Project consists of (1) the Dam, (2) a spillway, (3) the Reservoir, (4) an intake and powerhouse, and (5) the West Fish Lift and the East Fish Lift, all of which are located on the River approximately 10 miles north of the River's confluence with the Bay.

The West Fish Lift, adjacent to the Dam's right abutment, is currently operated under an agreement with USFWS for Shad egg production and other research purposes. The newer East Fish Lift, located near the midpoint of the Dam, is used primarily to pass Shad, Herring, and other migratory fish during the March-June migration season. The Project also includes a new Eel passage facility on the west side that began operation in May 2017.

The Reservoir serves as the lower reservoir for Muddy Run. It also serves as the source of cooling water for Peach Bottom and the York Energy Center. The Reservoir is also a public water supply source, with the City of Baltimore and Chester Water Authority (in Pennsylvania) having permitted withdrawals of 250 million gallons per day and 30 million gallons a day, respectively.

The powerhouse is integrated with the Dam. There are 13 turbine-generator units, associated draft tubes, and transformer bays. Water flowing through the turbines is discharged via the draft tubes into the Tailrace.

The Project area includes 15 recreation facilities and public access areas: Lock 13, Lock 15, Muddy Creek Boat Launch, Cold Cabin Boat Launch, Dorsey Park, Line Bridge, Broad Creek Public Landing, Glen Cove Marina, Conowingo Swimming Pool and Visitor's Center, Peach Bottom Marina, Conowingo Creek Boat Launch, Funk's Pond, Conowingo Dam Overlook, Fisherman's Park/Shures Landing, and Octoraro Creek Access.

5. Applicable Maryland Water Quality Standards & Criteria

A. Reservoir

The Reservoir has been designated as a Class I-P water, i.e., the Reservoir is to be used for water contact recreation, habitat for non-tidal warmwater aquatic life, and public water supply. The water quality criteria that are currently applicable to the Reservoir and relevant to this Certification are:

i. DO of at least 5 mg/L;

ii. Bacteriological criteria;

iii. PCBs in fish tissue;

iv. Chlorophyll-A (10 ug/l 30 day average, 90th percentile not greater that 30 ug/l);

v. Turbidity (150 max, 50 average); turbidity levels may not exceed levels detrimental to aquatic life;

vi. pH (6.5-8.5);

vii. Temperature (not to exceed 90 degrees); and

viii. Narrative criterion that prohibits waters from being polluted with any material in amounts sufficient to: (1) be unsightly; (2) produce taste or odor; (3) change the existing color to produce aesthetically objectionable color; (4) create a nuisance; or (5) interfere directly or indirectly with designated uses.

B. Downstream

The discharge from the Project impacts water quality in the River below the Dam and in the Bay. Applicable water quality standards for these waters, including designated uses, relevant to this Certification are as follows:

i. *The mainstem of River from the Dam to the confluence with the Bay.* This water has been designated as a Class II-P water. This water is to be used for water contact recreation, public water supply, habitat for non tidal warmwater aquatic life, estuarine and marine aquatic life and shellfish harvesting, migratory spawning and nursery, seasonal shallow water submerged aquatic vegetation (SAV), and Open-Water Fish and Shellfish. The water quality criteria which are currently applicable to this water and relevant to this Certification include:

a. Narrative criterion that prohibits the water from being polluted with any material in amounts sufficient to: (1) be unsightly; (2) produce taste or odor; (3) change the existing color to produce aesthetically objectionable color; (4) create a nuisance; or (5) interfere directly or indirectly with designated uses; and

b. DO criteria for Class II-P waters are the same as Class I-P waters ("the [DO] concentration may not be less than 5 milligrams/liter at any time"), except for the following subcategories applicable in the reach downstream of Dam:

    1. Seasonal and Migratory Fish Spawning and Nursery: From February 1 through May 31, the DO level must be greater than or equal to 6 milligrams/liter (mg/l) for a 7-day averaging period, with an instantaneous minimum requirement of greater than or equal to 5 mg/l. For all other times during the year, the DO levels are as follows: (A) greater than or equal to 5.5 [mg/l] for a 30-day averaging period . . . in tidal fresh waters (salinity less than or equal to 0.5 ppt); (B) greater than or equal to 5 [mg/l] for a 30-day averaging period . . . (salinity greater than 0.5 ppt); (C) greater than or equal to 4.0 [mg/l] for a 7-day averaging period; (D) greater than or equal to 3.2 [mg/l] as an instantaneous minimum; and (E) for protection of the endangered shortnose sturgeon, greater than or equal to 4.3 [mg/l] as an instantaneous minimum at water column temperatures greater than 77 degrees;

    2. Seasonal Shallow-Water SAV: Same as items (A) through (E) in Section 5.B.i.b.1, year-round; and

    3. Open-Water Fish and Shellfish: Same as items (A) through (E) in Section 5.B.i.b.1, year-round;

c. Temperature (not to exceed 90 degrees);

d. pH: Normal pH values may not be less than 6.5 or greater than 8.5;

e. Turbidity may not exceed levels detrimental to aquatic life. With regard to turbidity resulting from any discharge, such turbidity "may not exceed 150 units at any time or 50 units as a monthly average" (measured in Nephelometer Turbidity Units);

f. Color in the surface water may not exceed 75 units as a monthly average. Units shall be measured in Platinum Cobalt Units;

g. Concentrations of chlorophyll a in free-floating microscopic aquatic plants (algae) may not exceed levels that result in ecologically undesirable consequences that would render tidal waters unsuitable for designated uses; and

h. Class II-P waters are subject to MDE's toxic substances criteria for protection of fresh water and freshwater-adapted estuarine aquatic organisms and to protect public water supplies and the wholesomeness of fish and shellfish for human consumption (MDE's regulations set forth criteria for some 112 toxic substances, including inorganic substances, organic compounds, polycyclic aromatic hydrocarbons and phthalates, and pesticides and chlorinated compound).

ii. *The Bay*. The Bay has designated uses of aquatic life, fishing, seasonal migratory fish spawning and nursery, seasonal shallow water SAV uses from April 1 to October 30 to a depth of 1 meter, open-water fish and shellfish uses, seasonal deep-water fish and shellfish, seasonal deep-channel refuge, and narrative criteria that prohibits waters from being polluted by materials or substances which are unsightly, putrescent, odorous, create a nuisance, or interfere directly or indirectly with designated uses. The numeric water quality criteria that are currently applicable and most relevant to this Certification are the DO criteria (and in particular, the DO criteria for the DO Non-Attainment Area), including:

a. Seasonal Migratory Fish

1. From February 1-May 31: DO must be greater than or equal to 6 mg/L for a 7 day averaging period with an instantaneous minimum requirement of greater than or equal to 5 mg/L; and

2. From June 1-January 31: Same as Open-Water Fish and Shellfish.

b. Open-Water Fish and Shellfish:

1. DO must be greater than or equal to 5.5 mg/L for a 30 day average (salinity less than or equal to 0.5 ppt);

2. DO must be greater than or equal to 5.0 mg/L for a 30 day average (salinity greater than 0.5 ppt);

3. DO must be greater than or equal to 4.0 mg/L for a 7 day averaging period and greater than or equal to 3.2 mg/L as an instantaneous minimum; and

4. For protection of shortnose sturgeon, DO must be greater than or equal to 4.3 mg/L as an instantaneous minimum when water column temperatures exceed 77 degrees.

c. Seasonal Shallow-Water SAV: Year-round, same as Open-Water Fish and Shellfish.

d. Seasonal Deep Water Fish and Shellfish:

1. DO must be greater than or equal to 3.0 milligrams/liter for a 30-day averaging period from June 1 through September 30;

2. DO must be greater than or equal to 2.3 milligrams/liter for a 1-day averaging period from June 1 through September 30;

3. DO must be greater than or equal to 1.7 milligrams/liter as an instantaneous minimum from June 1 through September 30; and

4. The open-water fish and shellfish subcategory criteria apply from October 1 to May 31.

e. Seasonal Deep Channel Refuge: DO must be greater than or equal to 1.0 milligrams/liter as an instantaneous minimum from June 1 to September 30 except for Bay segments subject to variances.

6. Summary of Findings

In light of all the evidence before the Department, including the Application, comments and testimony received, and all other studies, modeling, and information reviewed during the Application review process, the Department has determined that the Project adversely impacts water quality in the State of Maryland, including but not limited to the following ways:

A. The Project has significantly and adversely impacted biota in the Lower River and the northern Bay over the past 90 years of operation, as a result of: (i) its highly unnatural operational flow regimes; (ii) the Dam serving as a barrier to fish passage upstream; and (iii) the Dam serving as an obstacle to fish passage and coarse-sediment transport for habitat downstream. Aquatic habitat in the Tailrace is adversely affected by daily peaking flows and the elimination of movement of some coarse-grained sediments that are stored in the Reservoir. Daily peaking hydropower operation also results in high velocities and excessive turbulence in water discharged through the Dam, which reduces deposition of any available coarse-grained sediment and affects the amount of Lower River habitat available to species such as Shad, Herring, Sturgeon, Eels, turtles, and freshwater mussels, as well as SAV and macro-invertebrate communities.

B. 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 were adversely impacted. The duration of time before the Project was required to maintain any amount of daily minimum flow downstream throughout the year, and before any working fishlift was constructed to allow fish to move by their own volition upstream, has had significant consequences for the health of the aquatic system from above the Dam to the northern Bay.

C. 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.

D. Additional provision for fish passage is necessary to assist in the recovery of historic fish populations. Prior to the construction and operation of the Project, species such as Shad and Herring spawned in prime spawning habitat in the River above the current location of the Dam. The River and northern Bay were vibrant and active fisheries for these species. With a healthy aquatic system, millions of Shad and Herring should be passing upstream in the River every year; in 2017, only 15,000 Shad and 65 Herring passed the Dam. Millions of Eel, an important host species for freshwater mussels that filter pollution out of waters, should be present in the Lower River, including areas upstream of the Dam; in 2017, only thousands were collected at the base of the Dam and transported upstream. Consequently freshwater mussel populations have declined dramatically in the 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.

E. The Reservoir, formed by the construction of the Project, replaced 14 miles of flowing, dynamic River habitat with an impoundment and fundamentally altered aquatic habitat. The Reservoir lacks suitable habitat for freshwater mussels, which has adverse consequences for water quality, as these organisms provide important ecosystem services of filtration and transformation of sediment and nutrient pollution. Reservoir-adapted fish such as gizzard shad have replaced and continue to threaten populations of riverine species that would typically be dominant. The Reservoir has elevated levels of chlorophyll-A during summer months with increased water temperatures, which impact drinking water supply uses of the water. Elevated PCB levels in fish tissue in fish in the Reservoir and below the Dam impact fish consumption-related uses, and have triggered the development of TMDLs to address these impairments.

F. Invasive fish species, which may be more likely to proliferate in a degraded system, passing the Dam have the potential to suppress native species, alter the food web, and reduce biodiversity. Invasive species including the blue catfish (*Ictalurus furcatus*) and northern snakehead (*Channa argus)* have spread throughout the Bay watershed. Based on information from Licensee, a snakehead or blue catfish has already passed volitionally through a fishlift at the Project in 2017. The blue catfish and snakehead are both top predators in areas where they have become established and would further threaten the ecological balance of the River.

G. Although the Dam has in the past trapped and stored sediment and nutrients and served as a barrier to downstream transport to the Bay, the Reservoir is now full, as no efforts have been undertaken over the life of the Project, such as routine dredging, to maintain any trapping function. As a result, sediments and nutrients move downstream, and during large storm events, significant amounts of trapped sediment and nutrients are scoured from the behind the Dam and discharged downstream. By releasing significant amounts of sediment and nutrients through scouring during storm events, the Dam has altered the nature, timing, and delivery method of these materials with adverse consequences for the Lower River and the Bay. Nutrients discharged as a result of the in-filled state of the Reservoir adversely impact DO levels and thus aquatic life in the DO Non-Attainment Area.

H. In-filling of the Reservoir with sediment increases the velocity of water in the Reservoir, and the altered hydrological dynamics result in unfavorable substrate conditions and a

generally sparse invertebrate community in the lower two-thirds of the Reservoir. Increased water velocity also increases bed shear and induces additional scour and movement downstream of sediment and associated nutrients.

I. The Project traps trash and debris behind the Dam, which accumulates over time, threatening recreational uses of the Reservoir and potentially concentrating pollutants, and if not removed regularly is vulnerable to sudden downstream transport during moderate to large storm events. Significant amounts of trash and debris moving downstream in single events creates hazards for recreational uses and blocks water supply intakes downstream.

J. Absent the Dam, there would be 24 miles of open river between the dam at Holtwood and the Bay, and there would be some natural transformation and attenuation of sediment and nutrients, as the River would be better connected to its floodplain and there would be coarse sediment regularly moving downstream. This would support larger SAV beds, and the area downstream of the head of tide (about 5 miles from the mouth of the River) would have a larger delta formed from deposition of sediment carried by the River as its flow enters the slower moving water in the Bay. More coarse sediment, floodplain connection, and SAV would make the River system more resilient, including its ability to attenuate nutrients and minimize damage associated with moderate to large rainfall events.

7. Requirements and Conditions

A. Compliance with WQS, Generally

The Project shall comply with all WQS and other applicable Laws and Authorizations.

B. Fish Passage

i. The Licensee shall implement and comply with all provisions of:

(a) the MDE-FPIP;

(b) the MDE-AEPIP; and

(c) the MDE-ISMP.

ii. The Licensee shall take such actions as may be necessary to permit at least 5,000,000 Shad and at least 12,000,000 Herring that approach the Project to pass the Dam each year during the Term on a schedule to be determined by MDE as the Licensee implements the MDE-FPIP.

iii. Notwithstanding any provision of the MDE-FPIP to the contrary, if the Shad population immediately upstream of York Haven Dam is determined to be less than 150,000 (using a counting methodology approved by MDE) as of December 31, 2039, MDE will reassess the trap and transport crediting aspects of the MDE-FPIP, and MDE will decide, in consultation with DNR and, as MDE deems appropriate, other fisheries experts, whether and

how to adjust such crediting. The Licensee shall be bound to apply whatever adjustments that MDE makes at that time to the crediting aspects of the MDE-FPIP from that point forward.

iv. Notwithstanding any provision of the MDE-FPIP to the contrary, if the Shad population immediately upstream of York Haven Dam is determined to be less than 400,000 (using a counting methodology approved by MDE) as of December 31, 2054, MDE will reassess the trap and transport crediting aspects of the MDE-FPIP, and MDE will decide, in consultation with DNR and, as MDE deems appropriate, other fisheries experts, whether and how to adjust such crediting. The Licensee shall be bound to apply whatever adjustments that MDE makes at that time to the crediting aspects of the MDE-FPIP from that point forward.

C. Aquatic Life and Seasonal Migratory Fish - Operational Flow Regime Impacts

i. The Licensee shall operate the Project in accordance with the Minimum Flow Regime beginning on September 1, 2018 and ending on December 31, 2028.

ii. The Licensee shall operate the Project in accordance with the Year 10 Flow Regime starting on January 1, 2029, *provided, however*, if MDE determines, based on Adaptive Management Flow Studies, that modifications to the Year 10 Flow Regime are likely to result in benefits to the aquatic system greater than or equal to the benefits MDE expects if the Year 10 Flow Regime is implemented without such modifications, the Secretary will notify the Licensee of such determination in writing prior to January 1, 2029, in which case the Licensee shall operate the Project in accordance with the Year 10 Flow Regime, modified in accordance with such notice from the Secretary (the "Modified Year 10 Flow Regime"), starting on January 1, 2029.

iii. For purposes of this Section 7.C, "benefits to the aquatic system" includes statistically significant improvement in (a) the percentage of Shad and Herring moving from the Tailrace and being captured in the fishlifts within three days of their entry 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 within the segment of the River between the Project and the head of tide.

iv. For purposes of this Section 7.C, "Adaptive Management Flow Studies" means scientifically sound studies voluntarily completed by or for the Licensee as described more fully below, subject to independent external scientific peer review and submitted by the Licensee to MDE. For each Adaptive Management Flow Study, the Licensee shall develop a study design, with the objective of testing one or more component parts of the Year 10 Flow Regime to determine whether such component part(s) provide benefits to the aquatic system. The Licensee shall subject the study designs to independent external scientific peer review by at least five qualified and independent scientists with specialties in the appropriate scientific disciplines, and incorporate any consensus recommendations into the study design as a result of that process. The Licensee shall provide to MDE for approval a copy of each final study design with the results of the independent external scientific peer review prior to initiating the Adaptive Management Flow Study. For each Adaptive Management Flow Study, a report containing the data collected and an analysis of results shall be subjected to independent external scientific peer

review by at least five qualified and independent scientists with specialties in the appropriate scientific disciplines. Once independent external scientific peer review of the Adaptive Management Flow Study results is completed, the Licensee shall incorporate and/or address any consensus-based comments and provide to MDE the study report and copies of all independent external scientific peer review comments. The study report and the results of independent external scientific peer review shall be submitted to MDE by January 1, 2027, so that MDE has adequate time to review and consider the need for potential changes to the Year 10 Flow Regime.

v. If compliance with the Minimum Flow Regime, the Year 10 Flow Regime, or the Modified Year 10 Flow Regime, as the case may be (each, "Applicable Flow Requirements"), would cause the Licensee, any of its affiliates, or any subsequent owner or operator of Peach Bottom or Muddy Run to violate or breach any Law, Authorization, or agreement with any governmental entity, including the Nuclear Regulatory Commission license for Peach Bottom and any agreement with the City of Baltimore, the Licensee may deviate from the Applicable Flow Requirements to the least degree necessary in order to avoid such violation or breach. In such circumstances, the Licensee shall provide to MDE, within one week of each such deviation, a written report identifying the Law, Authorization, or agreement that necessitated the deviation, describing the actual minimum flows provided during the deviation period, the duration of the actual minimum flows under these circumstances, and any observed adverse impacts to aquatic life (e.g., fish kills, additional observed delays in migratory fish reaching the fishlifts, etc.).

D. Dissolved Oxygen (DO) in the Chesapeake Bay

i. The Licensee shall ensure that Project operations and discharges do not adversely impact DO levels, and consequently aquatic life, in the Bay in any manner that would constitute a violation of WQS including designated and achieved uses.

ii. To ensure the Project's compliance with DO WQS including designated and achieved uses, beginning with calendar year 2025, the Licensee shall annually reduce the amount of nitrogen included in the Project's discharges by six million (6,000,000) pounds and the amount of phosphorus in the Project's discharges by two hundred sixty thousand (260,000) pounds (or such different amounts of phosphorus and nitrogen reductions as may be approved by MDE, provided that such different amounts of nitrogen and phosphorus reductions provide the equivalent protection of DO levels in the DO Non-Attainment Area that would be provided by six million (6,000,000) pounds of nitrogen reductions and two hundred sixty thousand (260,000) pounds of phosphorus reductions) (the "Required Nutrient Reductions").

iii. If, in a final watershed implementation plan intended to mitigate the water quality impacts of the Reservoir in-fill (the "Conowingo WIP"), one or more of Maryland, the District of Columbia, New York, Delaware, Virginia, West Virginia, and Pennsylvania (each, a "Bay Jurisdiction") has committed to actions that will result in some portion(s) of the Required Nutrient Reductions being achieved, the Licensee may credit against its Required Nutrient Reduction obligation the nitrogen and/or phosphorus reductions that are actually achieved by the Bay Jurisdictions. To obtain any such credit, the Licensee shall submit a written request therefor, with supporting documentation, to MDE.

iv. The Licensee shall provide to MDE for review and approval, no later than December 31, 2019, a nutrient corrective action plan (the "NCAP") for achieving the Required Nutrient Reductions and otherwise ensuring that DO levels in the DO Non-Attainment Area are not adversely impacted by Project operations and discharges. The NCAP may propose any combination of corrective action strategies, including:

(a) Payment of an in-lieu fee annually at $17.00 per pound of nitrogen and $270.00 per pound of phosphorus in accordance with payment instructions provided by MDE from time to time; *provided*, that the in-lieu fee amounts of $17.00 and $270.00 are deemed effective as of January 1, 2019 and shall be adjusted for inflation on January 1, 2020 and on January 1 of each year thereafter, based on the cumulative change in the CPI;

(b) Installation of best management practices and/or ecosystem restoration actions (e.g., restoration of buffers, land conservation, stream and wetland restorations, re-forestation, and/or freshwater mussel and oyster restoration); and/or

(c) Dredging the Reservoir, subject to Licensee obtaining all necessary Authorizations for such dredging.

v. Subject to the other provisions of this Section 7.D.v, the Licensee shall comply with the NCAP as approved by MDE in writing during the Term. If MDE determines during the Term that the Required Nutrient Reductions are, in whole or in part, either not necessary or not sufficient to meet DO criteria in the River and/or the Bay, MDE may re-open this Certification pursuant to Section 7.Q.xvii to reduce, eliminate, or increase the Required Nutrient Reductions. If MDE re-opens this Certification to increase or reduce the Required Nutrient Reductions, the Licensee shall submit a revised NCAP to MDE for approval within 60 days after MDE notifies the Licensee in writing that this Certification is being re-opened.

vi. The Licensee shall develop and submit for MDE review and approval no later than December 31, 2019, a Sediment & Nutrient Monitoring Plan, the purpose of which shall be to: (a) quantify changes in the extent and amount of sediment and nutrients being discharged from the Dam over the Term; (b) understand the impacts of changing sediment and nutrient conditions on living resources in the Bay; and (c) understand nutrient and sediment changes and impacts resulting from major storm events of greater than 400,000 cfs.

E. DO in the River Downstream of the Dam as Measured at Station 643

i. The Licensee shall ensure that Project operations and discharges do not adversely impact DO levels, and consequently aquatic life, in the River in any manner that would constitute a violation WQS including designated and achieved uses.

ii. No later than June 30, 2019, the Licensee shall submit to MDE for approval a plan for monitoring DO at Station 643 (the "643 Monitoring Plan"). The 643 Monitoring Plan shall provide for continuous monitoring of DO levels in the Tailrace at Station

643 beginning no later than December 31, 2019. The 643 Monitoring Plan shall include a description of data collection and analysis procedures, equipment maintenance and calibration procedures, and schedules for reporting results to MDE.

iii. If the monitoring conducted under the 643 Monitoring Plan identifies violations of the daily average or instantaneous standard, the Licensee shall, within 30 days, notify MDE of the exceedence in writing and submit a plan to MDE for approval proposing corrective actions to prevent similar exceedences in the future. The Licensee shall implement such corrective action plan after it is approved by MDE.

iv. No later than June 30, 2019, the Licensee shall submit to MDE for approval a plan for monitoring and reporting any fish kills exceeding 50 fish in the Reservoir and/or the Tailrace (the "Fish Kill Monitoring Plan"). The Fish Kill Monitoring Plan shall include data collection procedures, analysis methods, and reporting commitments.

F. Trash and Debris in Reservoir and Movement Downstream

i. The Licensee shall employ clamming (or any other equally or more effective measures of its choosing approved by MDE), to remove floating and water surface trash and debris that accumulates in the Reservoir behind the Dam at least weekly (unless storm conditions preclude removal in a particular week). During clamming/trash and debris removal events, the Licensee shall remove all visible trash and debris. Removal shall occur at least forty (40) times per year between January 1 and November 1, starting in January 2019. The Licensee shall monitor and record the duration of the clamming/trash and debris removal events (number of hours), and the amount of debris and trash removed and subsequently disposed of during each clamming/trash and debris removal event (in cubic yards). The Licensee shall submit these data to MDE each year by November 30 and, after 3 years of this effort, and, based on these data, the Licensee may request from MDE a reduction in the required frequency of clamming/trash and debris removal events, and MDE may reduce the required frequency of clamming/trash and debris removal events based on a review of the data.

ii. The Licensee shall, no later than December 31, 2019, employ on a daily basis the use of a self-propelled skimmer barge (unless storm conditions preclude its use during a particular timeframe). If the Licensee seeks to reduce the requirement to use this skimmer barge on a daily basis, the Licensee shall provide MDE with data collected over a 3 year period documenting the days and hours of operation and the amount of material collected and disposed of (in cubic yards) for each week of operation. Based on the data collected, the Licensee may request a from MDE a modification to this requirement for daily operation of the skimmer barge, and MDE may modify the requirement to use a self-propelled skimmer barge daily based on a review of the data.

iii. The Licensee shall respond to any complaint from a marina operator or public boat ramp "monitor" (e.g., DNR) about accumulated trash and debris interfering with recreational uses in the Reservoir by removing any accumulated trash and debris that is interfering with recreational uses within 48 hours of a complaint during the recreational season (between Memorial Day and Labor Day) and properly disposing of removed materials. The Licensee shall maintain for MDE review, records of complaints filed (name, date, time, location,

nature of the trash and/or debris issue and amount), and corrective actions taken (date, time, description of action, and, amount of trash and/or debris removed).

iv. The Licensee shall sponsor at least two annual community-based cleanups of the Reservoir, tributaries upstream of the Project that feed the Reservoir, and the River and tributaries downstream of the Project. The Licensee shall advertise each event, provide all needed supplies, and arrange and pay for the disposal of collected materials.

v. After any storm event which has resulted in trash and debris moving downstream and blocking downstream water supply intakes in the River, the Licensee shall ensure that trash and debris that is blocking downstream water supply intakes is removed as soon as it is safe to enter the water after the storm event.

vi. No later than December 31, 2019, the Licensee shall perform and submit to MDE a study regarding the feasibility of using one or more water wheel trash interceptors powered by solar panels or other renewable sources (a "Trash Wheel"), to remove floating and water surface trash and debris in the Reservoir. If Licensee determines that using one or more Trash Wheels to aid compliance with WQS would be reasonably practical, the Licensee shall submit to MDE for approval a plan for the installation thereof at the Project.

G. Chlorophyll-A Levels in the Reservoir

i. No later than June 30, 2019, the Licensee shall submit to MDE for approval a plan for monitoring chlorophyll-A levels in the Maryland portion of the Reservoir (the "Chlorophyll-A Monitoring Plan"). The Chlorophyll-A Monitoring Plan shall provide for collection of three (3) years of data on chlorophyll-A levels in the Maryland portion of the Reservoir between May 1 and September 30, in accordance with a monitoring protocol to be provided by MDE no later than March 31, 2019, and shall be designed to determine with a high level of statistical confidence whether chlorophyll-A WQS are exceeded in the Maryland portion of the Reservoir between May 1 and September 30 in any particular year.

ii. Pursuant to the Chlorophyll-A Monitoring Plan, the Licensee shall provide MDE with (a) annual reports of all measured chlorophyll-A levels and dates and locations of monitoring in the Maryland portion of the Reservoir by December 31 of the year in which the monitoring occurred; and (b) a final report that analyzes and presents the results of all chlorophyll-A monitoring completed by June 30 of the year after the final year of monitoring.

iii. If any of the reports required by Section 7.G.ii reflect that chlorophyll-A levels in the Maryland portion of the Reservoir exceed WQS, the Licensee shall, within six (6) months after the date on which such report was submitted to MDE, submit to MDE for approval a plan to reduce chlorophyll-A levels in the Maryland portion of the Reservoir between May 1 and September 30 to meet WQS for chlorophyll-A within five (5) years (the "Chlorophyll-A Reduction Plan").

iv. If MDE determines at any time that chlorophyll-A levels in the Maryland portion of the Reservoir exceed WQS, and the City of Baltimore withdrew water from the Reservoir and incurred necessary additional treatment costs associated with elevated chlorophyll-

A levels in that year, the Licensee shall promptly reimburse the City of Baltimore for such additional costs.

H. PCB Levels in Fish Tissue

i. The Licensee shall ensure that Project operations and discharges do not cause or contribute to PCB levels in fish tissue in violation of WQS including designated and achieved uses.

ii. MDE is reviewing available information on the potential sources of PCBs in the Reservoir and downstream of the Project to determine the need for additional data collection and/or corrective actions to address elevated PCB levels in fish tissue in the Reservoir and downstream. MDE may, in the future, require the Licensee to undertake data collection (e.g., sampling of sediment for PCBs) and/or actions to reduce PCB levels in the Reservoir and/or in the Project's discharges to the River.

iii. Should MDE determine that the Licensee needs to undertake data collection and/or reduce PCB levels in the Project's discharges to the River and/or in the Reservoir, MDE may re-open this Certification pursuant to Section 7.Q.xvii to require the Licensee to develop a plan for MDE review and approval for data collection and/or corrective actions to reduce PCB levels in the Reservoir and/or in the Project's discharges to the River. The Licensee shall prepare and submit for MDE approval any such plan requested by MDE within twelve (12) months of MDE's request.

I. Shoreline Management Plan (SMP)

i. The Licensee shall comply with the SMP, subject to the other provisions of this Section 7.I.

ii. Non-Project use of Project Land. If the Licensee intends to make any non-Project use of any Project land, or receives any request from a third party for non-Project use of any Project land, the Licensee shall (a) prepare, or require the third-party requestor to prepare, a written an assessment of the impacts on water quality of the proposed use; (b) provide this assessment to MDE for MDE's review and decision regarding whether the proposed use is consistent with WQS including designated and achieved uses; and (c) not engage in or allow such use until MDE notifies the Licensee in writing that MDE has no objections to such proposed use.

iii. Shoreline Vegetation Management. If the Licensee intends to make any modifications to the shoreline vegetation for viewshed maintenance and development and recreation access within the Project boundary, the Licensee shall (a) prepare a written assessment of the impacts on water quality of the proposed modifications; (b) provide this assessment to MDE for MDE's review and decision regarding whether the proposed modifications are consistent with WQS including designated and achieved uses; and (c) not undertake any such modifications until MDE notifies the Licensee in writing that it has no objections to such proposed use.

iv. Sensitive Natural Resources Protection Overlay and Policies. The Licensee shall consult with MDE regarding any proposed modification of an existing use of Project lands in cases where such use may affect any sensitive aquatic resource identified by the Licensee in the "sensitive resources overlays" included in the SMP.

v. SMP Updates. No later than January 1 of 2028, 2038, 2048, and 2058, the Licensee shall submit to MDE for approval proposed improvements to the SMP (each, an "SMP Update"). Each SMP Update shall include an assessment of the impacts of deleted, revised, or new measures on water quality.

J. Turtle Management Plans

i. Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit to MDE for approval, a plan for the protection and enhancement of the bog turtle population associated with Project lands (the "Bog Turtle Plan"). The Bog Turtle Plan shall include (a) the restriction of mowing in the wetlands within the Project boundaries that are documented to support bog turtles; (b) invasive plant and woody plant control, particularly red maples and reed canary grass, in the areas around the wetlands within the Project boundaries that are documented to support bog turtles; (c) limits on public access to the wetlands within the Project boundaries that are documented to support bog turtles without advertising the reason; and (d) an assessment of the impacts, if any, of the specific measures planned to be implemented on WQS including designated and achieved uses.

ii. Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit to MDE for approval, a plan for the protection and enhancement of the northern map turtle population associated with Project lands (the "Map Turtle Plan"). The Map Turtle Plan shall include (a) annual monitoring of the northern map turtle population at the Project for 10 years, followed by population monitoring every 5 years during the Term; (b) a study to determine the amount of artificial basking habitat needed over the normal range of generation flows to support current and future populations of northern map turtles within the Reservoir and all areas of the downstream River affected by generation flows; (c) a study to determine the proper locations for deployment of artificial basking platforms; (d) nest management and protection measures; (e) annual monitoring of the use and success of both the mitigation and protection measures; (f) an assessment of the northern map turtle's response to changes in operating practices at the Project that are required by this Certification or the New License; and (g) methods of altering or amending protection and mitigation measures as a result of the monitoring, in consultation with MDE.

K. Waterfowl Nesting Protection Plan

Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit for MDE approval a waterfowl nesting protection plan (the "Waterfowl Plan"). The Waterfowl Plan shall: (i) identify specific Project-related effects on nesting waterfowl, such as flooding during the nesting season; (ii) identify which species of nesting waterfowl (including the black-crowned night heron) are affected by the Project, if any; (c) if Project-related effects are identified, describe appropriate protection or mitigation

measures; and (d) provide an assessment of the impacts of such protection and mitigation measures on water quality.

L. Monitoring Stream Flows in the Tailrace

Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit to MDE for approval a plan for the re-design, installation, and maintenance of best available real-time flow telemetry at the stream gage in the Tailrace (USGS Station Gage #01578310) (the "Tailrace Gage Plan"). The Tailrace Gage Plan shall provide for Licensee to submit monitoring results from the Tailrace Gage to MDE no less than annually, by December 31 of each year, which results shall be included in the Minimum Stream Flow Operation Plan (MSFOP) annual report.

M. Sturgeon Protection

Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2020 (or sooner, if required by a federal governmental agency), submit to MDE for approval a plan for the protection and enhancement of the Sturgeon populations associated with the Project (the "Sturgeon Plan"). The Sturgeon Plan shall include: (i) provisions to monitor and report stranded Sturgeon within Project boundaries and in the River downstream from the Project; (ii) provisions to eliminate stranding of Sturgeon as a result of Project operations; (iii) procedures for trapping, handling, and safely returning Sturgeon lifted at any fish lift to the Tailrace; (iv) monitoring of water quality in any tanks used to hold Sturgeon; and (v) procedures for monitoring tagged Sturgeon and other tagged fish below the Dam and in the Bay including Environmental DNA.

N. Habitat Improvement Projects

i. No later than September 1, 2019, the Licensee shall submit to MDE for approval a plan for implementing Habitat Improvement Projects ("HIPs") in the River extending approximately 4.5 miles downstream of the Dam to the island complex that includes Robert and Spencer Islands (the "HIP Plan"). The HIPs shall target habitat improvements for Shad, Herring, freshwater mussels, native EAV and SAV, shortnose sturgeon, smallmouth bass, and macroinvertebrates at the following locations: (a) the mouth of Octoraro Creek; (b) the north end of Sterret Island; (c) McGibney Island; (d) the Robert, Wood, and Spencer Island complex; (e) the mouth of Deer Creek; (f) Snake Island; (g) downstream of Bird Island; (h) Rowland Island; and (i) the Fish Pot area along the western shore, located southwest of Bird Island. The objectives of the HIPs shall include creating, enhancing, or protecting (1) habitat for Shad and Sturgeon at the spawning and fry life stages; (2) natural vegetation (while minimizing the potentially negative impacts of working near invasive vegetative species); and (3) habitat for other aquatic species.

ii. The Licensee shall develop conceptual HIP designs based on a review of the latest Habitat Suitability Index maps, water surface elevations, depths, velocities, and substrate mapping. Hydraulic analysis shall be used to assist in determining the final location, length, height, and structural design of HIP structures to meet HIP objectives. The HIP Plan shall include for each HIP a description of the proposed HIP, the current habitat suitability, the

limiting factors for specific flow regimes, a preliminary assessment of feasibility, and any potential constraints.

O. Lower River Fisheries Survey

i. No later than September 1, 2019, the Licensee shall submit to MDE for approval a plan for monitoring and protection of fish in the Lower River, specifically targeting the federally-endangered Maryland Darter ("Darter") and the State-threatened Chesapeake Logperch ("Logperch") population(s) (the "Fish Protection Plan"). The Fish Protection Plan shall (a) include monitoring by Licensee of the River tributaries' fish populations and the lower riffle habitats of Deer Creek, Octoraro Creek, Broad Creek, and Conowingo Creek during spring, summer, and fall every five years; (b) provide for monitoring by electrofishing (conventional and trawl), snorkeling, and/or seine surveys, or otherwise as approved by DNR; and (c) require each sampling event in riverine habitat to include sampling technique(s) targeting Darter and Logperch.

ii. No later than September 1 of each year during the Term after 2019, the Licensee shall submit to MDE a comprehensive fisheries report including (a) analysis of fish population trends and correlations with abiotic data, if available, based on data obtained through implementation of the Fish Protection Plan; and (b) the Licensee's recommendations for continued protection and enhancement of the fish populations below the Dam and statistical methodologies used to estimate sample size and/or extinction probabilities.

iii. No later than September 1 of 2024, 2029, 2034, 2039, 2044, 2049, and 2054, the Licensee shall submit to MDE for approval proposed improvements to the Fish Protection Plan (each, an "FPP Update").

P. Spillway Modifications/Fish Stranding Minimization

No later than September 1, 2019, the Licensee shall submit to MDE for approval a plan for modifying the spillway Tailrace and/or modifying operational flow practices at the Project to reduce the numbers of rare, threatened, or endangered fish species stranded by Project operations (the "Stranding Minimization Plan"). If the Stranding Minimization Plan includes physical alterations in the spillway tailrace area, the Licensee shall include proposed methods to excavate new exit channels and/or the fill the designated isolated pools. If the Stranding Minimization Plan includes newly constructed exit channels, such new exit channels shall direct fish and other aquatic species towards the River's thalweg and shall be designed to prevent fish from avoiding the proposed channel exit to the Tailrace.

Q. General Requirements and Conditions

i. Other Authorizations. This Certification does not relieve the Licensee of the responsibility to obtain any other Authorizations related to the Project.

ii. Compliance with WQS / No Unauthorized Discharge or Other Work: The Licensee shall meet all applicable WQS including designated and achieved uses associated with the operations of and discharge from the Project. Except as specifically set forth herein (if at

all), this Certification does not authorize the discharge of any pollutants. The Licensee shall not discharge any waste or wastewater from the Project, unless specifically authorized by MDE. This Certification does not authorize any work to occur in waters of the State, including any dredging or the construction or placing of any physical structures, facilities, fill, or debris or the undertaking of related activities in any waters of the State.

iii. Civil and Criminal Liability: In issuing this Certification, MDE does not waive or surrender any right to proceed in administrative, civil, or criminal action for any violations of any Law occurring before issuance of this Certification. Nothing in this Certification shall be constructed to preclude the institution of any legal action for any reason or relieve the Licensee from any civil or criminal responsibilities, liabilities, or penalties for violation of any Law, including the Environmental Article and the Clean Water Act.

iv. Penalties for Noncompliance with Law and Violations of Certification: The Licensee shall comply at all times with the provisions, requirements, and conditions of this Certification, the Environment Article, the Clean Water Act, and all other applicable Laws and Authorizations. MDE may seek criminal, civil, and administrative penalties to the full extent provided by law for any violations of the provisions, requirements, and conditions set forth in this Certification, or for noncompliance with the Environment Article, the Clean Water Act, or other applicable Laws and Authorizations.

v. Record Keeping: All records and information resulting from the monitoring, sampling, record keeping, inspection, and reporting activities required by this Certification shall be retained during the Term, plus 5 years. This period shall be extended automatically during the course of litigation, or when requested by MDE. For any measurements or sampling taken to satisfy the requirements of this Certification, the Licensee shall record (a) the exact place, date, and time of sampling or measurement; (b) the person(s) who performed the sampling or measurement; (c) the dates and times the analyses were performed; (d) the person(s) who performed the analyses; (e) the analytical techniques or methods used; and (f) the results of all required analyses. The sampling and analytical methods used to shall conform to procedures for the analysis of pollutants as identified in 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants" unless otherwise specified by MDE in writing.

vi. Right of Entry: In addition to any other right of entry provided for by law, MDE, or its authorized representatives, shall have the right to enter at reasonable times the premises or property that is the subject of this Certification (including the Reservoir and all land within Project boundaries) or where any records are required to be kept under the provisions, requirements, and conditions of this Certification. This right of entry shall include the right to:

a. Access and copy, at reasonable times, any records that are required to be kept under the provisions, requirements, and conditions of this Certification;

b. Inspect, at reasonable times, any monitoring equipment or monitoring method required in this Certification;

c. Inspect, at reasonable times, any discharge facilities subject to this Certification;

d. Conduct sampling, at reasonable times, of any discharge or of the water column in the River or Reservoir;

e. Take soil or sediment borings or core samples, at reasonable times, in the bed of the River or the Reservoir; and

f. Take photographs.

vii. Duty to Provide Information: The Licensee shall submit to MDE, within the time frame stipulated by MDE, any information that MDE may require to determine compliance with this Certification. The Licensee shall also submit to MDE, upon request, copies of any records required to be kept by this Certification. When the Licensee is required to submit to any other federal or State resource agencies any reports that relate to the Project, the Licensee shall also submit a copy to MDE. Subject to the Maryland Public Information Act, all information submitted to MDE or collected as a condition of this Certification may be made publicly available.

viii. Property Rights: The issuance of this Certification does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of federal, State, or local Laws.

ix. Notice / Reporting of Noncompliance: Unless MDE provides different instructions in writing from time to time, any notice or other submission due to MDE under this Certification shall be provided in writing to:

Maryland Department of the Environment
Water and Science Administration
1800 Washington Boulevard
Baltimore, Maryland 21230

For any violations of the provisions, requirements, or conditions of this Certification, the Licensee shall promptly notify MDE by telephone within twenty four (24) hours of discovery of the violation, at 410-537-3510. In addition, within five (5) days, Licensee shall provide MDE with the following information in writing:

a. A description of the violation, including the date, time, location, and estimated discharge volume (if applicable), and impact on receiving water;

b. The cause of the violation, to the extent known;

c. The anticipated time the cause of the violation is expected to continue, or, if the condition has been corrected, the duration of the period of the violation;

d. Steps taken by the Licensee to eliminate or correct the violation;

e. Steps planned or implemented by the Licensee to prevent the recurrence of the violation; and

f. A description of the Licensee's accelerated or additional monitoring to determine the nature of any impact or harm caused by the violation.

Any notice or other submission due under this Certification to any governmental agency other than MDE shall be provided in writing to such agency in accordance such agency's written instructions from time to time.

x. Web Portal: The Licensee shall maintain at all times during the Term a web site or page specifically designed to provide the public with access to the information contemplated by Section 2.C.vii (the "Web Portal").

xi. Annual Reporting: The Licensee shall submit annual reports to MDE by September 1 of each calendar year following the issuance of this Certification and shall contemporaneously post such reports on the Web Portal. The annual reports shall summarize all work performed by the Licensee to comply with the provisions, requirements, and conditions of this Certification, and shall be in a format approved by MDE.

xii. No Waivers: MDE's failure to enforce any provision, requirement, or condition of this Certification shall not constitute a waiver of MDE's right to enforce any such provision, requirement, or condition, or otherwise relieve the Licensee from compliance with any obligations imposed by this Certification.

xiii. Additional Monitoring: The Licensee shall undertake additional monitoring, studies, or other measures relating to compliance with WQS including designated and achieved uses if MDE determines that there is a likelihood that any violations of WQS including designated and achieved uses have occurred or may occur.

xiv. Transfer: The Licensee shall notify MDE in writing upon transferring property ownership or responsibility for compliance with these conditions to another person. The new owner/operator shall request in writing transfer of this Certification to its name.

xv. Severability: The provisions of this Certification are severable. If any provision of this Certification is held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this Certification is held invalid, its application to other circumstances must not be affected. In the event any provision of this Certification is held invalid, and the Department determines that any applicable effluent limitation, other limitations, or water quality standards or requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State Law will not be met (including the failure to sustain a designated or achieved use) or that State or federal Law will be violated, or that further conditions are necessary to assure compliance, the Department may reevaluate and modify this Certification in accordance with Section 7.Q.xvii to include additional conditions necessary to assurance compliance with all such limitations, standards, or requirements.

xvi. No Third Party Beneficiaries: No provisions of this Certification are intended, nor will be interpreted, to provide or create any third party beneficiary rights. No third party shall have any legally enforceable rights, claims, or benefits under this Certification as to the Department, nor shall forbearance to enforce any term of this Certification by the Department be construed as creating any rights, claims, or benefits for any third party. No third party shall have any rights to enforce the terms of this Certification against the Licensee except as may be expressly be provided by federal law, including the citizen suit provisions of the Clean Water Act. This Certification does not affect and is not intended to influence any third party's rights to independently investigate, evaluate, respond to, and file claims regarding any impacts from groundwater or surface water pollution.

xvii. Adaptive Management: This Certification may be re-opened to be modified in order to comply with any applicable effluent limitation, other limitations, or water quality standards or requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State law if the limitation, standard, or requirement so issued or approved contains different conditions or is otherwise more stringent that any requirements of this Certification. If MDE determines that any applicable effluent limitation, other limitations, or water quality standards or requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State law are not being met (including the failure to sustain a designated or achieved use) or that State or federal law are being violated, or that further conditions are necessary to assure compliance, MDE may reevaluate and modify this Certification to include requirements or conditions necessary to assure compliance with all such limitations, standards, or requirements. This includes:

a. Additional requirements or conditions are necessary to address adverse or potentially adverse Project effects on water quality or designated or achieved uses that did not exist or were not reasonably apparent when this Certification was issued;

b. There is a change in the Project or its operations that was not contemplated by this Certification that might adversely affect water quality or designated or achieved uses;

c. The re-licensing of Holtwood and/or Safe Harbor, as well as any changes associated with Muddy Run's FERC license or the Section 401 water quality certification for Muddy Run, requires alignment of flow, fish passage, sediment, nitrogen, and phosphorus-related conditions in this Certification;

d. Future TMDLs or modifications to existing TMDLs (not otherwise addressed in this Certification) identify impairments that justify additional conditions in order to ensure that WQS including designated and achieved uses are met over the Term;

e. Revised conditions related to trap and transport credits for fish passage are necessary based on review in subsequent years of the federal license of whether numeric targets for the number of Shad upstream of the York Haven Dam are being met;

f. MDE obtains any information providing a sound, science-based rationale for modifying any Plans or any requirements or conditions in this Certification, including information pertaining to climate change; or

g. Any typographical error is found in this Certification.

Any modified conditions of this Certification shall, so long as it is in effect, become a condition of any federal Authorization that is hereafter issued for the Project, and MDE may seek, in accordance with applicable Law, to have any modified Certification condition incorporated into any existing federal Authorization for the Project.

xviii. Reimbursement of Oversight Costs: The Licensee shall reimburse MDE and DNR for the reasonable and actual costs incurred by MDE, DNR and their contractors in connection with the direct administration and oversight of Licensee's compliance with this Certification, including any costs for conducting environment health monitoring or testing, collecting and analyzing soil samples, surface water samples, or groundwater samples, or reviewing any data, plans or information submitted by the Licensee. The maximum amount of costs for which Licensee shall be required to reimburse MDE pursuant to this Section 7.Q.xviii shall be Two Hundred Fifty Thousand ($250,000) per year, and the maximum amount of costs for which Licensee shall be required to reimburse DNR pursuant to this Section 7.Q.xviii shall be Two Hundred Fifty Thousand ($250,000) per year *provided*, that each of the foregoing amounts shall be adjusted for inflation after the date of this Certification on July 1, 2019 and on July 1 of each year thereafter, based on the cumulative change in the CPI.

xix. Final Decision; Appeal Rights: This is a final decision on the Application. Any person aggrieved by the Department's decision to issue this Certification may appeal such decision in accordance with COMAR 26.08.02.10F(4). A request for appeal shall be filed with the Department within 30 days of publication of the final decision, and specify in writing (a) the reason why the final decision should be reconsidered; and (b) a detailed description of the requestor's specific legal right, duty, privilege, or interest which may be adversely affected by the Department's final decision. A request for appeal shall be submitted to: Secretary of the Environment, Maryland Department of the Environment, 1800 Washington Boulevard, Baltimore, MD 21230. After issuance of notice of the Department's decision on the request for reconsideration, a contested case hearing shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq., Annotated Code of Maryland. Any request for an appeal does not stay the effectiveness of this Certification.

DATED this 27th day of April, 2018.

D. Lee Currey
Director
Water and Science Administration
Maryland Department of the Environment
State of Maryland

ATTACHMENT #1
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

MDE Fish Passage Improvement Plan ("MDE-FPIP")

This MDE-FPIP is based on the requirements of DOI's Modified Prescription for Fishways Pursuant to Section 18 of the Federal Power Act for the Project, dated June 8, 2016 (the "Prescription"), which shall be authoritative guidance for purposes of interpreting this MDE-FPIP and defining the Licensee's obligations hereunder. Notwithstanding the foregoing, in the event of any conflict between this MDE-FPIP and the Prescription, this MDE-FPIP shall govern and control.

Without limiting the generality of Section 2.C.ii of the Certification, in all cases where this MDE-FPIP requires the Licensee to consult with or make any submission to MDE, the Licensee shall also consult with, or make such submission to DNR, unless otherwise specified.

1. Initial Fishlift Capacity

The Licensee shall provide a fish lift capacity of at least 7 million pounds of fish per season immediately after issuance of the New License. Two 6,500-gallon hoppers sharing the same holding pool, with a cycle time of 15 minutes, provides capacity to move 7 million pounds of fish in a single season. Based on projected numbers of a successful Shad restoration using the population model, a fish lift capacity of 7 million pounds of fish should provide safe passage at the Project for approximately half of the Term (assuming that the gizzard shad population does not grow larger than 4.4 million fish). For details on calculating fish lift capacity, refer to Appendix A to this MDE-FPIP.

2. Final Potential Fishlift Capacity

The Licensee shall construct sufficient fishlift capacity during the Term to ensure that as populations of Shad and Herring grow in the system, that fishlift capacity is increased as necessary to ensure that upstream passage is not impeded by undersized fishlift capacity preventing the attainment of the restoration objectives. MDE recognizes the potential lack of capacity during the later years of Shad and Herring restoration, and will re-open this Certification to address this issue at a later date if fishway capacity appears to be a limiting factor to population restoration, as reflected in declining upstream fish passage efficiency due to lack of fishway capacity.

3. Design Flows for Fishways/Fishlifts

The Licensee shall design new fishlifts to ensure operation under River flows in the range of 6,330 cfs to 143,000 cfs. However, the Licensee shall not be required to operate the fishlifts at flows greater than 113,000 cfs unless data available at the time demonstrates that operation of fishlifts at flows greater than 113,000 cfs is necessary to achieve the target efficiency.

Furthermore, the fishlifts shall be designed with sufficient freeboard (or other protection) to minimize damage from River flows of up to the 50-year return interval.

4. Efficiency Criteria

The Licensee shall meet the SRAFRC (2010, 2013) and the USFWS (2015b) upstream and downstream passage efficiency criteria for the River basin that are the basis for the Department of the Interior (DOI) 2016 Modified Fishway Prescription (and the requirements of this Certification). MDE defines upstream fish passage efficiency as the proportion of the fish in the Tailwaters that successfully move through the fishlift and continue upstream migrations, calculated as a percentage. Downstream fish passage efficiency is the proportion of the fish that approach the upstream side of the Project and survive unharmed as they pass the Project and continue downstream migrations. Definitions for certain fish passage terms used in this MDE-FPIP are provided in Section 18 of this MDE-FPIP. Where no numeric efficiency criteria are set, MDE's goal is to minimize Project impacts to migratory fish populations, with a goal of 100 percent passage and the understanding that no project is likely to fully achieve that goal despite application of the best available technology. Where MDE, based on DNR analysis, has information or modeling indicating that restoration may be achieved with less than 100 percent passage, MDE has adopted numeric targets that will achieve restoration, and measures to reach those targets.

4.1 Criteria for Upstream Shad Passage Efficiency

The Licensee shall operate the Project to achieve the upstream passage efficiency criterion of passing 85 percent of all adult Shad that enter the Tailwaters ("Target Efficiency"). The Licensee can receive additional credit toward achieving the upstream passage efficiency criterion for adult Shad by trapping at the Project and transporting Shad to upstream of York Haven Dam and thus avoiding upstream passage impediments at the intervening hydroelectric projects on the River (see Section 13 of this MDE-FPIP).

4.2 Criteria for Downstream Shad Passage Efficiency

The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 80 percent of the adult Shad moving downstream past the Dam. The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 95 percent of the juvenile Shad moving downstream past the Dam.

4.3 Criteria for Upstream Herring Passage Efficiency

The Licensee shall operate the Project to provide safe, timely and effective upstream migration for adult Herring that approach the Tailwaters. MDE reserves the right to develop numerical criteria for upstream Herring passage efficiency in the future when additional information about Herring populations becomes available and re-open this Certification in the future to establish required numeric targets for upstream passage efficiency for Herring. Any needed change in fishlift requirements resulting from such new targets is not provided for in this Section 4 and would also be considered a basis for re-opening the Certification.

4.4 Criteria for Downstream Herring Passage Efficiency

The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 80 percent of the adult Herring moving downstream past the Dam. The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 95 percent of the juvenile Herring moving downstream past the Dam.

5. Seasonal Implementation of Fish Passage

5.1 The Licensee shall operate a fishlift for upstream passage of anadromous fish daily during the Shad and Herring upstream Migration Period, as set forth in Appendix D to this MDE-FPIP. The Licensee shall operate the fish lift(s) daily during the upstream Migration Period, and begin releasing attraction flows at least one hour prior to the start of daily lift operations. The fish lift(s) will operate at the following times during the Migration Period: (1) in March, from 7 a.m. to 7 p.m.; (2) in April, from 6:30 a.m. to 7.30 p.m.; and (3) in May and June from 6:00 a.m. to 8:00 p.m.

5.2 The Licensee shall ensure prior to the start of the Migration Periods that all mechanical elements of the fishlifts are working properly. The Licensee shall repair, maintain, and test fishlifts as necessary in advance of the migration period, in accordance with the Fishlift Operation and Maintenance Plan ("FOMP") so as to begin operations when required.

5.3 The Licensee shall maintain and operate fishlifts to maximize fish passage effectiveness throughout the upstream and downstream migration periods, as set forth in Appendix D to this MDE-FPIP.

6. Fishlift Operation and Maintenance Plan

6.1 The Licensee shall develop and submit a FOMP to MDE approval. The Licensee shall keep the FOMP updated on an annual basis, to reflect any changes in fishlift operation and maintenance planned for the year. If MDE requests a modification of the FOMP, the Licensee shall respond to the requested modification within 30 days of the request by filing a written response with MDE.[1] Any modifications to the FOMP by the Licensee shall require approval by MDE. The FOMP shall include:

(a) Schedules for routine maintenance, pre-season testing, and the procedures for routine fishlift operations, including seasonal and daily periods of operation, and associated Dam and powerhouse operational measures needed for proper fishlift operation;
(b) Details of how the Project shall be operated during the migration season to provide for adequate fish passage conditions, including:
    (i) Pre-season preparation and testing;
    (ii) sequence of turbine start-up and operation under various flow

[1] Requested modifications to the FOMP will not include changes to turbine operations. Any modifications to turbine operations shall be implemented only pursuant to Section 8.

regimes to enhance fishlift operation and effectiveness;

(iii) debris management at the fishway entrance, guidance channels, and the exit; and

(iv) plant operations to provide near- and far-field attraction flows required for the fishlift zone of passage in the tailrace;

(c) Trap and transport logistics plan and design plans for west and east fish lift modifications needed for trap and transport, including provisions for planning trap and transport logistics so as to avoid, to the extent possible, trapping a population unrepresentative of the migrating population as a whole.

(d) Procedures for removing invasives (see Attachment #3 for invasive species requirements) and sturgeon handling;

(e) Standard operating procedures for monitoring and enumerating fish passage by species;

(f) Standard operating procedures for collecting biological samples from target species to assess restoration efforts;

(g) Standard operating procedures for monitoring and reporting operations that affect fish passage;

(h) Standard operating procedures in case of emergencies and Project outages to first, avoid, and second, minimize, potential negative impacts on fishway operations and the effectiveness of upstream and downstream passage for target species; and

(i) Plans for post-season maintenance, protection, and winterizing the fish lifts and Eel passage facilities.

6.2 The Licensee shall provide written documentation to MDE that all fishlift operational personnel have reviewed and understand the FOMP and it shall be signed by the operations manager of the Project. Copies of the approved FOMP and any modifications shall be provided to MDE on an annual basis.

6.3 By December 31 of each year, the Licensee shall provide an annual report to MDE detailing: the implementation of the FOMP, including any deviations from the FOMP and a process to prevent those deviations in the future; any proposed modifications to the FOMP, or in the case of emergencies or Project outages, the steps taken by the Licensee to minimize adverse effects on fisheries including any proposed modifications to those steps to further enhance their effectiveness in the future; and operational data for both fishlifts and the Project to allow MDE and others identified by MDE to examine correlations between particular operational patterns and successful or unsuccessful fishlift operation; and to confirm, once an operational regime with known effectiveness is settled upon, that the Project continues to operate under that regime. MDE understands that details of operation constitute confidential business information, and agrees to protect them from disclosure as such to the extent it is able to do so by law. The annual report shall also include:

(a) Description of routine maintenance as well as repairs made to the fishways or Eel passage facilities during the previous fish passage season;

(b) Average daily flows at the Marietta Gage;

(c) Daily water temperature and DO readings in the fish lift and Tailwater areas;
(d) Hourly individual turbine unit operations and discharge, hourly total discharge from the powerhouse, hourly discharge over the spillway, and hourly passage counts of all fish species at each lifted hopper;
(e) Index for every lift of each hopper's "fullnesss" through visual observations and shall be developed in consultation with MDE; provided, that if technology becomes available to quantify the bucket "fullness", then after a written request from MDE, the Licensee shall incorporate this technology;
(f) Thirty-minute recordings of total flow discharging from behind the hopper, total flow discharging from the attraction water supply diffuser, water surface elevation immediately upstream from the entrance gates, water surface elevation at the Tailwaters, elevation to the crest of the entrance weir gates, and any irregularities such as the identification of a visible boil in the zone over the floor diffusers;
(g) Number of fish by species trapped and transported, including date, time, and location of release; and
(h) Daily collection of biological information from adult Shad, gizzard shad, Herring, or other species as designated by MDE to include sex ratio, condition, length, weight, and age.

6.4 In addition to the annual report, the data for daily flows, water quality, Project operations, fishlift operations and fish passage as described above shall be recorded in a database during the fish passage season and MDE and its designees shall be provided open access to that database. Data shall be entered into the database no later than one week after collection. These data shall be used to assess the impacts of River conditions and hydropower operations on successful fish passage through the lifts, with the goal of achieving a better diagnosis of potential fish passage issues at the Project.

6.5 By January 31 of each year, the Licensee shall consult with MDE to discuss the FOMP. This meeting shall occur no later than January 31 of each year unless the Licensee and MDE agree on a different date. At this annual meeting the participants shall discuss the fish passage results from the previous year, review regulatory requirements for fish lift operations, and discuss any modification or testing the Licensee shall conduct during the upcoming season.

7. Sequencing of Upstream Fish Passage Construction and Implementation

Timely construction, operation, and maintenance of fishlifts is necessary to ensure their effectiveness and to achieve restoration goals. Therefore, the Licensee shall: (1) notify, and (2) obtain approval from MDE for any extension of time to comply with conditions MDE has required.

7.1 Trap and Transport of Shad and Herring

The Licensee shall trap and transport Shad and Herring to areas upstream of York Haven Dam annually. The number of Shad and Herring trapped and transported annually will be

up to 80 percent of the number of each species captured in the fish lifts up to a maximum of 100,000 of each species annually. Trap and transport operations shall continue until the Licensee achieves a measured 85 percent upstream passage efficiency for Shad at the Project without reliance on the trap and truck credit as provided for in Section 13 of this MDE-FPIP.

7.2 Initial Construction

Unless otherwise stated, the Licensee shall implement the requirements of Section 10.1 of this MDE-FPIP by September 1, 2021. Construction shall be conducted in a way as to allow for trap and transport operations as well as volitional passage at the EFL to continue uninterrupted during this time period. A fish trap shall be constructed in the EFL no later than September 1, 2019. It shall be capable of trapping and holding target fish while continuing to pass fish. Safe and effective transfer of fish from the trap to the tailrace is required. The design must be approved by MDE prior to construction.

7.3 Operation in the First Passage Season after License Issuance

No later than September 1, 2019, trap and transport operations from the EFL and WFL shall begin. A total of 80 percent of the run, up to 100,000 Shad and 100,000 Herring per year shall be trapped and transported to the mainstem River upstream of York Haven.

8. Efficiency Testing and Triggering of Subsequent Modifications

8.1 No later than September 1, 2023, the Licensee shall begin the "Initial Efficiency Test" of fish passage at the Project. The Licensee shall conduct the Initial Efficiency Test as defined in Section12.2 of this MDE-FPIP in order to evaluate passage performance relative to upstream efficiency criteria for Shad and Herring as described in Section 4 of this MDE-FPIP. Gizzard shad or other designated species (to be designated by MDE with input from DNR) shall be included in all efficiency tests to understand how they affect efficiency for Shad and Herring. In the 5th year after the year in which the New License is issued, the Licensee shall also assess mortality of Shad during the trap and transport process.

8.2 If at the end of the Initial Efficiency Test, the combined results of the three-year study (the combination of measured efficiency of the Initial Efficiency Test and the "Trap and Transport Credit" (as described in Section 13 of this MDE-FPIP) resulting in an "Adjusted Efficiency") meet the Target Efficiency of 85 percent for upstream passage of Shad, the Licensee shall operate the Project using the FOMP implemented during the Initial Efficiency Test. The Licensee shall then conduct a two-year "Periodic Efficiency Test" as defined in Section 12.2 of this MDE-FPIP in every 5th year thereafter to ensure that the upstream-prescribed efficiency criterion continues to be met through the Term.[2]

8.3 If at the end of the Initial Efficiency Test or after any Periodic Efficiency Test thereafter during the Term, or after any subsequent "Post-Modification Efficiency Test" as defined

[2] At the Licensee's election, and with MDE concurrence, the Periodic Efficiency Test may be extended an additional one year. Only after the efficiency tests are completed will the Licensee be required to propose, as may be necessary, a course of action to achieve the Target Efficiency.

in Section 12.2 of this MDE-FPIP, the study results indicate that the Licensee is not meeting the required Adjusted Efficiency, the Licensee shall conduct an evaluation of the radio telemetry data and any other data available to MDE and/or the Licensee to determine why passage efficiency is inadequate. Concurrent with the submission of the final report from an efficiency study, the Licensee shall propose a course of action most likely to achieve the Target Efficiency. MDE has designated a tiered list of options and the types of passage or capacity problems which the tiers may address. If the reason for not achieving the Target Efficiency is insufficient fishlift attraction, then the Licensee shall follow the actions in Section 10.2 of this MDE-FPIP.

If the fish lift capacity is insufficient then the Licensee shall follow the actions in Section 11 of this MDE-FPIP. In the event that both fishlift attraction and fish lift capacity are limiting factors to achieving the Target Efficiency, the Licensee shall address items listed under both Sections 10.2 and 11 of this MDE-FPIP, but only to the extent both attraction and capacity measures are necessary to achieve the required Target Efficiency and alleviate over-capacity. The list of measures in Sections 10.2 and 11 of this MDE-FPIP is not exclusive and does not preclude MDE or the Licensee from identifying and proposing other measures commensurate with the required level of improvement and corresponding tier. MDE shall react to the Licensee's proposal for improving fish passage efficiency within 90 days of receipt. It may:

(a) Say nothing, in which case the Licensee shall proceed with its proposed course of action;
(b) Agree affirmatively with the Licensee's proposed course of action, in which case the Licensee shall proceed;
(c) Propose a different option, not on the tiered list of options, which the Licensee shall proceed with if it agrees;
(d) Require, instead, that the Licensee implement an option or options from the appropriate (or lower numbered) tier to address each problem. MDE will choose that option (s) it deems most likely to achieve the *Target Efficiency. MDE* may select an option from a higher-numbered tier only if all options from an appropriate or lower-numbered tier have been implemented. If two or more options appear equally likely to achieve the efficiency criterion, MDE will present the Licensee with the choice, and the Licensee may proceed with whichever it prefers. MDE shall explain, in writing, its reasons for finding that its choice(s) is more likely than the Licensee's to lead to the desired passage efficiency. The Licensee shall then proceed with the selected course of action.

9. General construction requirements.

All functional (i.e., 30 percent, 60 percent, and 90 percent) and final design plans, operation and maintenance plans, construction schedules, and hydraulic model studies for the new fishlifts or modifications to existing fishlifts described herein shall be submitted to MDE for approval. The planning and design process for structures shall generally include computational fluid dynamics (CFD) modeling prior to construction and post-construction shakedown and testing to confirm modeling.

MDE, DNR, and USFWS shall be consulted during the design and construction of the fishlifts and MDE must approve all plans in writing prior to construction initiation. Upon a decision to build or modify, the Licensee shall meet with MDE, DNR, and USFWS to develop detailed construction plans and schedules, which shall be submitted for MDE approval no later than March 1, 2019, and thereafter, by January 31 of each construction year for approval by MDE. The detailed construction schedules shall be designed to minimize interruption of the fishlift operations and, to the extent possible, fishlift operation interruptions shall be scheduled during the month of June.

10. Fish Passage Facilities

10.1 Initial Construction Items

(a) *East Fish Lift Modifications*. The Licensee shall modify the EFL facility to provide 900 cfs attraction flow to the EFL. If the attraction flow cannot be provided within the current EFL structure without exceeding USFWS design specifications, flow in addition to internal EFL flow will be provided to achieve a total of 900 cfs. Modifications to the EFL facility will include replacing spillway gates A & B, replacing the crowder system, addressing structural vibration issues, replacing diffuser gates A and B, replacing the control system, and upgrading the electrical system to allow for a 15 minute lift cycle.

(b) *Replace the current 3,300-gallon hopper with two 6,500-gallon hoppers at the EFL*. The Licensee shall remove the current hopper and install two 6,500-gallon hoppers within the existing superstructure of the EFL. One hopper will replace the current 3,300-gallon hopper and the second hopper will be located immediately upstream from the current location of the existing EFL hopper (see Figure 10 from the DOI Modified Fishway Prescription of June 2016 showing the conceptual drawing of proposed modifications to the EFL). Access to both hoppers will be provided by the current entrance gates (A, B, and C) and the hoppers will share the same holding pool.

(c) *Trap and Transport Facilities at the EFL*. The Licensee shall reduce cycle time at each hopper at the EFL to be able to lift fish four times per hour and complete modifications to the EFL structure to allow for trapping and sorting fish at the EFL facility and transporting them to the western side of the Dam to a truck for transport upstream. Modifications to the EFL shall include two new sorting tanks; a loading tank; and a by-rail truck and forklift, or functionally similar equipment, to facilitate movement of Shad from sorting tanks at the EFL to the west shore. These improvements shall be accomplished without losing a season of the passage provided by the EFL.

(d) *Trap and Transport Facilities at the WFL*. WFL modifications shall be made to facilitate trap and transport including: decreasing lift cycle time by replacing the crowder linkage system and raising the elevation of the sorting tank(s), and providing a mechanism to allow for direct sluicing of fish into tanks mounted on the transport vehicle. These initial improvements shall be accomplished without losing a season of the passage provided by the EFL or trap and transport from the WFL.

(e) *Provide a Zone of Passage (ZOP) to the Fish Passage Facilities*. The Licensee shall construct and maintain structures, to provide Shad and Herring a ZOP (i.e., route of passage) as described in this Section 10.1(e). In advance of any ZOP development and/or construction, MDE and the Licensee will review CFD modeling results from the tailrace. The Licensee shall run the model under a predetermined number of structures arrangements (e.g., different angles, different spacing between the weirs, different weir slopes). In consultation with MDE, the Licensee shall choose to construct the configuration of structures that provides the most conducive hydraulic conditions for fish passage of Herring. The area to be considered for potential ZOP improvements includes approximately 2,500 feet on the west bank and 3,500 feet on the east side of Rowland Island. Based on CFD modeling results that analyze discharge velocities and turbulence, the Licensee shall provide stone weirs, and/or other suitable alternatives or measures that provide a contiguous ZOP from the southern tip of Rowland Island to one or both of the lifts. The Licensee shall install up to ten stone weirs, with the option of considering other configurations for structures. Model results will guide the placement and formation of these structures to provide for the hydraulic conditions necessary for the weakest swimmers (Herring) to reach the lifts. Specifically, the ZOP must be designed to maintain instantaneous velocities below 3 feet per second, separated only by brief regions of higher velocity that Herring may traverse in seconds at burst speeds up to 6 feet per second, over the full range of operational flows for the EFL, and in all generation scenarios. After ZOP construction is completed, the Licensee shall assess the ZOP for upstream migrating Herring under the full range of the current fish passage design flows (i.e., up to 113,000 cfs of River flow). These structures shall also minimize or eliminate sheltering areas for predators. The ZOP shall be subject to approval by MDE.

10.2 Improving Attraction Efficiency

Presented below is a list of physical and operational modifications to the Project intended to address observed deficiencies in fishlift attraction efficiency. The tiered process for improving attraction efficiency is based on passage efficiency during the most recent efficiency test. The items included in the different tiers were developed to be commensurate with the degree of shortfall from the *Target Efficiency.* If, based on the *Adjusted Efficiency* of the current test, all appropriate options from the corresponding tier, including any option proposed by the Licensee and approved by MDE have been exhausted, the items from the next highest numbered tier may be required, regardless of the current Project passage efficiency. More than one item from a tier may be completed at one time depending on the degree of the *Adjusted Efficiency* shortfall.

(a) *Tier I (Adjusted Efficiency 70%-85%)*. In the year following any failure by the Licensee to reach the *Target Efficiency* due to inadequate fishway attraction, the Licensee shall implement one or more of the modifications to Project operations and facilities described in this Section 10.2(a).

(i) *Correct any Technical Operational Problems and/or Implement Internal Modifications*. The Licensee shall correct any technical operational problems that may have been detected during the fish passage season and/or implement internal modifications to the WFL and/or EFL (e.g., energy dissipation, hydraulic attraction).

(ii) *Implementation of preferential turbine operating schemes.* The Licensee shall develop a turbine operation scheme that can range from simply first on/last off to modification of specific Francis and Kaplan unit operation to ensure that fish are able to successfully locate and access the fish lift entrances.

(iii) *Increase attraction flow at the EFL.* The Licensee shall construct an alternative attraction water structure as part of the EFL which shall be constructed to allow more than 1,000 cfs during the fish and Eel migration season and be adaptable for fish and Eel attraction and maintain velocities at or below USFWS criteria. The alternative attraction water structure and velocities must use field verification for the target species.

(b) *Tier II (Adjusted Efficiency 55%-69%).* Within 2 years following any failure to meet the *Target Efficiency,* the Licensee may implement either one of the modifications to the Project facilities described in this Section 10.2(b) to reach upstream passage efficiency.[3]

(i) *Relocate EFL Entrances A & B.* If the CFD modeling results indicate modifications to Entrances A & B will improve guidance to and accessibility of the lift entrances, then the Licensee shall extend the entrance channel at entrance A with two 45-degree turns in the fish passage facility channel, so as to discharge into the area behind the catwalk piers and upstream from the Kaplan turbine discharge/boil. The attraction flow should be effective along the catwalk and through the space between the piers. The Licensee shall also modify the existing entrance B so that the centerline of the discharge plume will be at a 45-degree angle to the River flow.

(ii) *Construct new Entrances with a separate crowder and holding pool.* No later than December 31, 2033, the Licensee shall build new entrances with a separate crowder and holding pool (Figure 10). The hopper will be accessed from the new entrance and through a proposed collection gallery that will span the full length of the Kaplan turbine section of the powerhouse. The new entrances and the collection gallery are intended to provide access to the EFL from the Francis turbine section of the powerhouse. The new collection gallery will be located against and along the powerhouse wall.

(c) *Tier III (Adjusted Efficiency less than 55%).* Following any failure by the Licensee to reach upstream passage efficiency, the Licensee may implement one or more of the modifications to Project operations and facilities described in this Section 10.2(c).

(i) *Construct an Auxiliary Water Supply (AWS) at the EFL.* The Licensee shall construct a new AWS stilling basin and system so the energy from up to 4,300 cfs

[3] MDE may require relocation of Entrances A&B and, if the *Adjusted Efficiency* continues to be between 55%- 69%. Entrance D at a later point. But then, per Tier III (and consistent with the "not before" dates), may only require the AWS, not the WFL. Alternatively, MDE may require the relocation of Entrance A&B. and in subsequent cycles proceed to choose the WFL (again. consistent with the "not before" dates) if(a) the *Adjusted Efficiency* is below 55% and Entrance D has not been constructed or (b) the *Adjusted Efficiency* is between 55%- *69%* and MDE determines that Entrance D is not likely to achieve the efficiency criterion.

can be dissipated and incorporated into effective attraction flows emanating from the multiple fish lift entrances.

(ii) *WFL Construction.* No later than December 31, 2043, the Licensee shall construct a new WFL (as described below, in parts 1-5) in the west corner of the powerhouse tailrace. The Licensee shall operate the new WFL as a Tailwater to headpond fish lift with a collection facility for fish sampling that could be used as a fish trap and transport facility. If MDE requires construction of the WFL for reasons of passage efficiency, it agrees not to subsequently require the EFL AWS stilling basin and system before 10 years after the completion of the WFL.

(A) WFL Construction, Part 1. The Licensee shall construct a facility that provides the capability of enumerating fish passage by species, allows for two independent trapping and holding facilities for biological sampling while continuing to pass fish, and that can also be used for trapping and transporting Shad and Herring with the potential for captured fish to be transported upstream of the York Haven Dam.

(B) WFL Construction, Part 2. The Licensee shall install two 6,500-gallon hoppers, with separate crowders, in the new WFL, capable of operating simultaneously.

(C) WFL Construction, Part 3. The Licensee shall construct the WFL to have the ability to provide up to 5 percent of hydraulic capacity of the Project (or up to 4,300 cfs) for attraction flow to the fishway entrance(s). During the design phase and during preconstruction, the Licensee shall conduct CFD modeling and other supporting analysis to develop appropriate fish lift entrance attraction flows, velocities, and hydraulic conditions. The Licensee shall operate the WFL to provide attraction flow of at least 2,600 cfs (3 percent of hydraulic capacity of the Project) during the Upstream Migration Period for Shad and Herring. With the goal of improving fish passage efficiency at the WFL following initial start-up of the new WFL, MDE may require the lift operator to modify operation of the fish lift, the allocation of flows through its AWS, and/or the total amount of flow being supplied to the WFL (up to a maximum of 4,300 cfs or 5 percent of the Project hydraulic capacity).

(D) WFL Construction, Part 4. The Licensee shall design and construct an AWS that meets science-based criteria for energy dissipation of the attraction flow while maintaining water quality standards.

(E) WFL Construction, Part 5. The Licensee shall conduct an assessment of the ZOP downstream of the WFL to ensure that it continues to be passable over the range of flows in which the WFL is operational.

11. Improving Fish Lift Capacity

Presented below are physical and operational modifications to the Project intended to address deficiencies in fish lift capacity. Implementation of modifications in the capacity tiers is independent of the implementation of similar items used to improve passage efficiency. Both

attraction and capacity improvements can be required simultaneously if deemed appropriate from the most recent study results and capacity calculations.

Capacity shall be deemed exceeded if daily capacity is exceeded more than 5 days in a passage season. If an index of fullness indicates that one hopper is consistently fuller than the other, capacity shall be prorated based on that index. Over the Term, depending on the length of the migratory run (as defined by the cumulative five percent to ninety-five percent) the number of days designated to define overcapacity may be changed by MDE in consultation with the Licensee.

11.1 Tier I (Adjusted Efficiency 70% — 85%)

Within 2 years following the Project having been deemed by MDE to have exceeded capacity, the Licensee shall submit to MDE for approval a plan to implement new additional entrances with a separate crowder and holding pool. The new hopper will be accessed from the new entrance and through a proposed collection gallery that will span the full length of the Kaplan turbine section of the powerhouse. The new entrances and the collection gallery are intended to provide access to the EFL from across the Kaplan section and the Francis turbine section of the powerhouse. The new collection gallery will be located against and along the powerhouse and shall be adaptive for fish including Eels. The new collection gallery shall be located against and along the powerhouse wall.

11.2 Tier II (Adjusted Efficiency less than 70%)

Within 3 years following any failure by the Licensee to reach upstream passage efficiency due to inadequate fishlift capacity, the Licensee shall submit to MDE for approval a plan to implement a new WFL (as described in Section 10.2(c)(ii) of this MDE-FPIP) in the west corner of the powerhouse tailrace. The Licensee will operate the new WFL as a Tailwater to headpond fish lift with a collection facility for fish sampling that could be used as a fish trap and transport facility. The WFL shall have a trap system with two independent holding facilities allowing passage while both traps are being operated.

12. Fish Passage Effectiveness Monitoring

Efficiency testing of both upstream and downstream fish passage, and determining mortality rates of Shad when using trap and transport are critical to evaluating the success of fish passage structures and operations, diagnosing problems, and determining both when modifications are needed and what modifications are likely to be effective. These measures are essential to ensuring the effectiveness of fishlifts over the Term, particularly in cases where the increasing size of fish populations as a result of improved upstream passage may also lower upstream fish passage efficiencies due to migrating fish crowding and exceeding daily or annual lift capacity, thus keeping some fish from successfully passing the Dam and limiting net effectiveness.

12.1 Fishway Effectiveness Monitoring Plan

The Licensee shall submit to MDE for approval a Fishway Effectiveness Monitoring Plan ("FEMP") no later than March 1, 2019. The FEMP will contain the plans for the studies described in Sections 12.2 through 16 of this MDE-FPIP. If MDE requests a modification of the FEMP, the Licensee shall file a written response with MDE within 30 days. Any modifications to the FEMP by the Licensee will require approval by MDE prior to implementation.

The Licensee shall submit yearly interim study reports to MDE following the conclusion of each study year. The interim and final reports for upstream passage studies will be submitted to MDE by December 31st of each study year. The interim and final reports for downstream passage studies will be submitted to MDE by August 1 following each study year. The final study report will include results for each life stage and type of study conducted with a determination of the Licensee's success or failure in achieving the passage efficiency criteria established in this Plan. In conjunction with submitting the final study report(s), the Licensee shall also provide electronic copies of all data collected from studies to MDE.

The Licensee shall consult with MDE to discuss the FEMP. This meeting will occur no later than January 31 each year unless the Licensee and MDE agree on a different date. At this annual meeting the participants shall discuss with the fish passage results from the previous year, review regulatory requirements for fish lift and Eel passage operations, and discuss any upcoming modification or testing the Licensee proposes for the upcoming fish passage season.

12.2 Initial Efficiency Test, Post-Modification Efficiency Tests, and Periodic Efficiency Tests for Upstream Passage of Shad and Herring

The *Initial Efficiency Test* and any *Post-Modification Efficiency Tests* will consist of a three-year fish tagging and monitoring study of Shad and Herring using radio telemetry, or other best tracking technology. If after two years the criteria cannot mathematically be obtained by a third year of study, the initial efficiency test will be concluded. The *Periodic Efficiency Tests* will consist of a two-year Shad-tagging study using the same techniques unless the Licensee elects, with MDE concurrence, to conduct an additional one year of study. The *Initial Efficiency Test* will begin in the 5th passage season after New License issuance. The *Post-Modification Efficiency Test* will begin in the first fish passage season immediately following any required modification implemented from the tiers. The *Periodic Efficiency Test* will be conducted on every 5th year after a previous study determines that the *Adjusted Efficiency* of the Project is achieving 85 percent passage efficiency for Shad. Early Periodic Efficiency Tests may be delayed by up to two years to coincide with the schedule for tests at Muddy Run agreed upon in the 2015 Settlement Agreement between USFWS and the Licensee.

These studies will use sufficient numbers of test fish to account for drop-back and other fish loss. These fish will be collected from a downstream location, and be representative of the migrating population as a whole. Specific details of the telemetry studies such as sample sizes, collection of and release location of tagged Shad and Herring, arrangement of telemetry receivers,

and appropriate statistical analyses shall be developed by the Licensee in conjunction with MDE and other resource agencies. The Licensee shall submit final study plans to MDE for approval prior to initiating any study.

13. Trap and Transport Credit for Shad

The Licensee shall receive additional credit toward the upstream passage efficiency criterion for adult Shad that are trapped and transported upstream of York Haven Dam. MDE will recognize the benefits to the species by giving credit towards the calculation of whether the efficiency criterion for upstream Shad passage is met, due to the value to restoration of avoiding the passage of impediments at the upstream hydroelectric projects. Details of the credit toward the efficiency criterion are provided in Appendix A to this MDE-FPIP. Part of the calculation of the credit toward efficiency criterion requires an estimate of the mortality associated with trap and transport operations. Beginning January 1, 2023, the Licensee shall work with MDE and other resource agencies to develop a one-year study to estimate the mortality of fish which are trapped and transported to areas upstream of York Haven Dam. Such a study will include assessment of immediate mortality (mortality occurring during transport) as well as delayed mortality (mortality occurring during some time period after release). The results of the study will be used to modify, as necessary, the mortality input utilized in the trap and truck credit. MDE adopts the Service's proposed methodology for this study as described in Appendix C to this MDE-FPIP; however the Licensee and MDE must reach agreement on the final methodology and final study design post-licensing.

14. Downstream Adult and Juvenile Shad and Herring Effectiveness Testing

The Licensee shall conduct downstream passage effectiveness studies of Shad and Herring in 2027 in coordination with MDE. As part of the FEMP for downstream passage, the Licensee shall evaluate both juvenile and adult life stages using a study protocol developed cooperatively with MDE to include a Reservoir route of passage study and an evaluation of passage survival. A route of passage study will be conducted to determine the routes chosen by downstream migrating fish through the Project under various generation conditions to determine if there are preferred routes of passage at the Dam and variations on survival through each of the routes. The route of passage study will be conducted for 2 years to account for inter-annual variation in flow conditions. The Licensee has the option to extend the route of passage study for an additional year.

If the above study is insufficient to determine survival, a one year separate and discrete passage study for both adult and juvenile Shad and Herring shall be conducted to estimate survival through the Kaplan and Francis turbines under best gate efficiency. This study will commence in the year following the completion of the above study. The effects of trauma due to changes in barometric pressure, such as the expansion and rupture of a fish's swim bladder, ,during turbine passage will be included as part of the turbine survival studies for all life stages when possible. Results of the studies will be used to determine through-Project survival (i.e. via spill, Francis turbines, Kaplan turbines, etc.), and immediate and latent mortality for each route to achieve the passage criteria. If Licensee is unable to achieve the efficiency criteria for

survival based on the results of the downstream studies, MDE may re-open the Certification to address this issue.

15. Fishway Inspections

The Licensee shall provide MDE personnel, DNR personnel, and other MDE-designated representatives, timely access to the fish passage facilities at the Project and to pertinent Project operational records for the purpose of inspecting the fishlifts to determine compliance with the MDE-FPIP.

16. Pre-License Actions Agreed to by the Licensee

16.1 The Licensee agreed to develop and finalize a detailed logistics plan and operating protocol for trap and transport of Shad and Herring from both the EFL and WFL. The Logistics plan was required to address near-term operations, as well as logistics necessary to support the collection and transport of up to 80 percent of the Shad and Herring passing the Project with a maximum transport of 100,000 Shad and 100,000 Herring annually. This plan was to be completed by December 31, 2017. The Licensee shall provide MDE with a status report on the logistics plan and operating protocol for trap and transport of Shad and Herring no later than September 1, 2018. If these items have not yet been completed, Licensee shall complete these items and submit them to MDE by no later than January 1, 2019.

16.2 The Licensee also agreed develop detailed Computational Fluid Dynamics (CFD) models of the zones of passage, in consultation with the Service, to the EFL and WFL to assess the ability of fish to reach the lifts. The Licensee shall provide MDE with a status report on these models no later than September 1, 2018. If these items have not yet been completed, Licensee shall complete these items and submit them to MDE no later than January 1, 2019.

16.3 The Licensee also agreed to develop its initial FOMP (as described earlier) by September 30, 2017. The Licensee shall provide MDE with a status report on the initial FOMP no later than September 1, 2018. If the initial FOMP has not yet been completed, the Licensee shall complete the initial FOMP and submit to MDE no later than September 30, 2018.

17. Items to be completed in 2017 – 2018

The Licensee shall finalize design plans for initial fishlift improvement and improvements to facilitate the trap and transport program by no later than December 31, 2018.

18. Definitions of Certain Terms

In addition to terms defined elsewhere in the Certification and this MDE-FPIP, the following terms have the following meaning when used herein:

Adjusted Efficiency - The calculated fish passage efficiency that accounts for the biological benefit of fish trapped and transported from the Project to areas upstream of other

mainstem dams. This calculated efficiency gives credit towards efficiency targets for the number of fish that are trapped and transported.

Anadromous - migratory fish that spawn in freshwater rivers but spend most of their life in the ocean.

Attraction Efficiency - The proportion of the migrating population that successfully passes a designated downstream point at the Project (i.e. the downstream end of Rowland Island), and successfully enters the fish lift.

Fish Ladder - an engineered ramp-like structure, typically constructed of concrete and/or metal, used to provide upstream fish passage.

Fish Lift - an elevator-like structure with a hopper used to convey fish from the Tailwaters to the headpond of high dams.

Fish Passage Facility - the physical structure of the fishway used to convey fish upstream; with the term being synonymous with "fish lift" at this Project.

Hopper - the structural part of the fish lift used to hold fish as they are transported from the Tailwaters to the head pond.

Safe Passage - the movement of fish through the zone of passage that does not result in any unacceptable stress, incremental injury, or death of the fish.

SRAFRC - Susquehanna River Anadromous Fish Restoration Cooperative.

Trap and Transport or T&T - fish that are collected at a downstream project and loaded in a tank truck and transported and released into some location upstream of that project.

Upstream Fish Passage Efficiency - the percentage of the fish present in the Tailwaters that successfully move through the fish lift and continue upstream migrations; e.g. the proportion of fish that start at point B (downstream end of Rowland Island in the case of the Dam) and passes point E in the diagram set forth in Appendix E to this MDE-FPIP.

Volitional Passage - a fish passage facility that allows fish to swim unimpeded from the Tailwaters to the headpond; fish lifts are not considered volitional passage because the fish rely on the operation of the lifts in order to pass upstream into the headpond.

Zone of Passage (ZOP) - The contiguous area of sufficient lateral, longitudinal, and vertical extent in which adequate hydraulic and environmental conditions are maintained to provide a route of passage through a stream reach influenced by a dam (or stream barrier); e.g. the area between point A and point E in the diagram set forth in Appendix E to this MDE-FPIP.

Appendix A to Attachment #1
Calculation of Fishway Capacity for a 6,500-Gallon Hopper

Biological Parameters:

$\lambda_m = 0.052$ (season/day)	Season-to-season run compression coefficient empirically determined design parameter
$\beta = 0.15$ (day/hr)	Hour-to-hour run compression coefficient empirically determined design parameter
T = 15 min	Lift cycle time (recommended)

Hopper Size:

$Vol_H = 868.9$ ft.^{3}	Estimate of proposed hopper volume (6,500 gallons)
$Vol_{fH} = 0.1$ (ft^3 / lbf)	Volume required per fish-pound, USFWS criterion; for lift times greater than 15 minutes, a 30 percent increase in Vol_{fH} is recommended

Allowable peak biological loadings:

$Flb_h = (Vol_H/v_{fH}*T)$	$Flb_h = 34,756$ lbf/hr	Allowable loading of fish in pounds per peak hour
$Flb_d = Flb_h / \beta$	$Flb_d = 231,706$ lbf/day	Allowable loading of fish in pounds during the peak day
$Flb_s = Flb_d / \lambda_m$	$Flb^s = 4,455,897$ lbf/season	Allowable loading of fish in pounds during an entire season

Appendix B to Attachment #1
Calculating Trap and Transport Credit

Credit Towards an Overall Efficiency Criterion (85 percent of fish entering the Tailrace)

For a given number of Shad trapped and transported we can estimate the number that would need to pass the Dam via the fish lift to result in the same number of spawners upstream of York Haven Dam. This number is termed "lift equivalents" (L_e) and is calculated as:

$$[1] \qquad L_e=(\sum_{i=1}^{n} TTi) \bullet (1 - TT_m)/D$$

Where TT_i refers to the number trapped and transported each year during a single or multi-year study to measure passage efficiency, and TT_m is the mortality associated with trapping and transporting Shad. Harris and I lightower (2011) estimated mortality of trapped and transported Shad in the Roanoke River to be 15 percent. However, SRAFRC (1997) gave estimates of mortality for holding Shad prior to trap and transport, mortality during the transport, and delayed mortality following release. When all these factors are considered, the overall mortality associated with trap and transport operations was 6 percent, which was used in this model. The denominator ***(D)*** in equation [1] will be calculated using the maximum efficiency of each of the two upstream dams with the highest passage efficiency over the three year study and the average of these efficiencies. For example, if the highest efficiencies of Holtwood, Safe Harbor, and York Haven Dams over the three year study were 0.60, 0.78, and 0.50, respectively, then the denominator would be calculated as $D = 0.60 \bullet 0.78\ \underline{(0.60+0.78)/2} = 0.3229$. It was assumed that other than the mortality associated with trap and transport operations, no other negative impacts on their fitness occurred compared to Shad that would migrate via multiple fish passage facilities to areas upstream of York Haven Dam.

The L_e can be added to the observed number that were lifted past the Dam during the study period to arrive at an adjusted total number that are passed via the fish lift (L_a).

$$[2] \qquad L_a = Le + \sum_{i=1}^{n} TTi)\ Li$$

where L_i is the observed number lifted in each year.
During a radio telemetry study at the Dam, an estimate of passage efficiency will be made and given the total number of Shad actually passed (lifted and released into the Reservoir + trapped and transported upstream), an estimate of the total number of Shad downstream of the Dam during all years of the study can be made.

$$[3] \qquad N = (\sum_{i=1}^{n} Pi)/Eo$$

where P_i is the total number passed each year and E_a is the estimated passage efficiency during the study. Equation [3] also assumes that no mortality is suffered while attempting to pass the Dam.

The variance of N can be estimated by the delta method using the estimated variance of E_a.

[4] $Var(N) = [Var(E_a) / E^4_a E^4] \bullet (\sum_{i=1}^{n} Pi)^2$

The adjusted passage efficiency is then the adjusted number that are lifted during the study divided by the total number of Shad downstream of the Dam during all years of the study.

[5] $E_a = L_a/N$

The associated variance from the delta method is:

[6] $Var(E_a) = [Var(N)/N^4] \bullet L^2_a$

The 95 percent confidence interval for $E_a$can be approximated as:

[7] 95% *C.I. is approximately equal to* 1.96 • square root of $Var(E_a)$

If the upper 95% confidence limit is greater than or equal to the efficiency criterion, then the criterion is considered to be met.

Appendix C to Attachment #1
Trap and Transport Mortality Study

To assess the mortality associated with trap and transport of Shad collected at the Dam and transported to areas upstream of York Haven Dam, a study design similar to that of Millard et al. (2005) will be employed. This study will have both a treatment group (Shad trapped and transported) and a control group (Shad not trapped and transported). The purpose of having both a treatment and a control group is to evaluate both the immediate and delayed mortality associated with T&T operations while controlling for mortality associated with handling stress while carrying out the study.

Control groups will consist of Shad that are caught in the lifts at the Dam, sorted from non-target species, and rather than being loaded into a truck and transported upstream, they will be released to a large holding tank located at the Dam (size to be determined) and monitored for 72 hours post-release.

Treatment groups will consist of Shad that are caught in the lifts at the Dam, sorted from non-target species, loaded into a truck, and driven around in the truck for a length of time equivalent to the trip duration to areas upstream of York Haven Dam. After simulating transport, the Shad will be placed into a holding tank located at the Dam and monitored for 72 hours post-release.

Experimental tanks for both treatment and control groups will be located at the Dam in order to eliminate any confounding effects of differences in water temperature/chemistry between treatment and control groups and to isolate the effects of transport. Experimental tanks will be set up with flow through conditions using water pumped from the Tailrace.

Each week throughout the fish passage season, a truck load's worth of fish (exact number yet to be determined) will be used in both treatment and control groups. Thus, the experiment will be temporally replicated for 4 to 8 weeks depending on the duration of the spawning run in a given year. This will allow assessment of mortality over the range of water temperatures experienced by Shad throughout the season.

During the 72 hour monitoring period, dead Shad will be removed from the tank as soon as they are noticed. Mortality will be quantified as the number of dead Shad divided by the number of Shad that entered either the treatment or control group. Mortality in the treatment group will include all Shad that died during the entire process from loading them into the truck to those found dead at the end of the 72 hour monitoring period.

Statistical Analysis

It will be assumed that total mortality of the treatment group consists of two components: 1) mortality associated with transport and release of the Shad; and 2) mortality associated with experimental handling of the Shad. Thus, total mortality of the treatment group = T&T mortality + handling mortality. The control group would only experience mortality associated with experimental handling. The instantaneous handling mortality rate (m_h) will be estimated from the control group as

$$Mh = -ln(S_c)$$

where S_c is the survival of the control group over all replicates throughout the season. The instantaneous total mortality in the treatment group will be estimated as

$$M_t = -ln(S_t)$$

where S_t is the survival of the treatment group over all replicates throughout the season. The conditional mortality associated with trap and transport (conditioned on handling mortality) is

$$u_{TT}) = A - [(A \bullet M_h) / ln(1 - A)].$$

where A is the fraction of fish that die from all causes ($1-S_1$). This equation is based on the traditional fisheries expression $u = A \bullet F/Z$ where u = the expectation of death from fishing, A = total mortality rate from all causes, F = the instantaneous fishing mortality rate, and Z = the total instantaneous mortality rate. Estimation of the conditional mortality associated with trap and transport (u_{TT}) according the above equation is preferred because it accounts for the probability that the two sources of mortality, trap and transport stress and handling stress, occur simultaneously over the monitoring period (Millard et al. 2005).

Literature cited:

Millard, M.J., J.W. Mohler, A. Kahnle, and A. Cosman. 2005. Mortality associated with catch-and-release angling of striped bass in the Hudson River. North American Journal of Fisheries Management. 25:1533-1541

Appendix D to Attachment #1
Upstream and Downstream Migration Periods for Certain Species

Species	*Upstream Migration Period* [1,2,3]	*Downstream Migration Period* [1,2,3]
Shad	Starting when River temperature reaches 50 ° F, until River temperatures rise above 72 ° F for four consecutive days, but ending no earlier than June 1, and no later than June 15[2]	July 1 through November 15 (juv.) May 1 through July 1, as long as river temperature is above 65 ° F[2] (adult)
Herring	Starting when River temperature reaches 50 ° F, until River temperatures rise above 72 ° F for four consecutive days, but ending no earlier than June 1, and no later than June [2,3,4]	June 15 through October 14 (juv.) April 15 1 through July 1 (adult)

Notes:

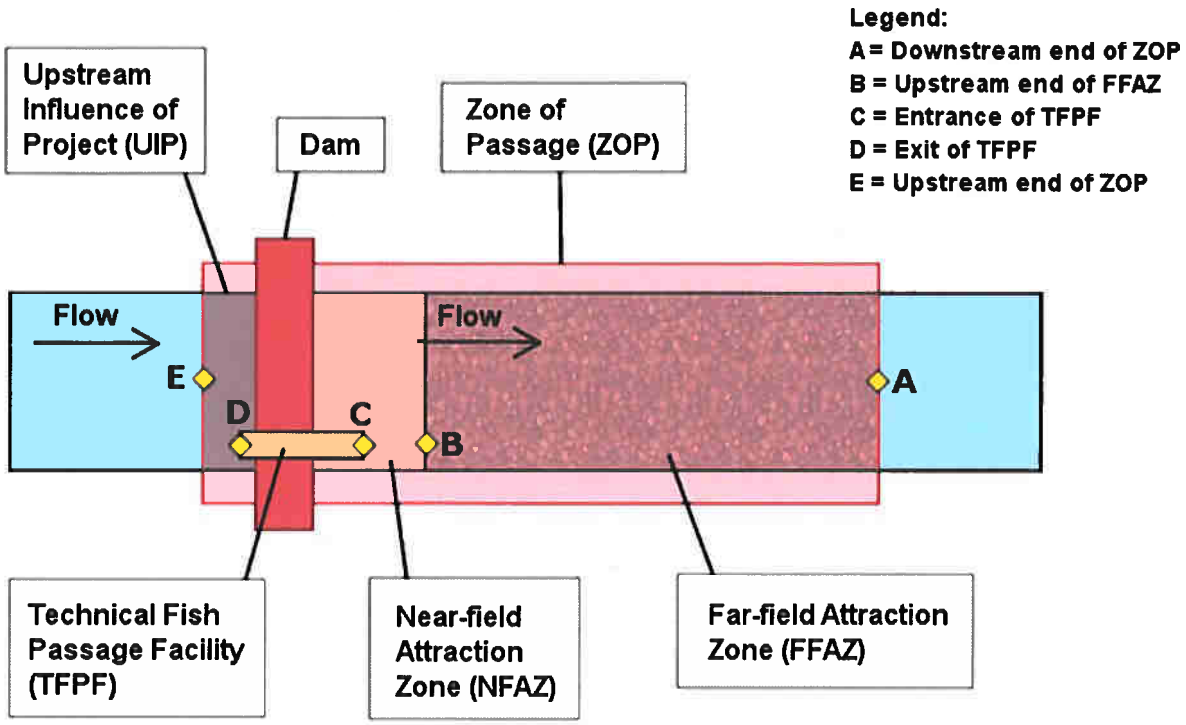
1. Any of these migration periods may be changed during the Term by MDE, based on new information. At any time during the Term, Licensee may submit new information to MDE in support of a request to change the migration periods. In the event MDE seeks to require downstream passage by means other than through the units, the downstream migration periods automatically will be reviewed jointly by MDE, other fishery agencies, and the Licensee.

2. Water temperatures shall be monitored once daily at 11 a.m. at Station 643 or some other location agreed upon by the Licensee and MDE.

3. MDE recognizes that, because of factors outside of the Licensee's control, safety considerations may preclude the personnel from performing duties necessary to commence fish passage measures at the Project by the commencement date. When such conditions arise, the Licensee shall notify MDE, and MDE and the Licensee shall consult regarding the anticipated schedule for commencing such measures.

4. This migration period is based on alewife migration timing from other tributaries to the Bay (Sutherland 2000, p. 9; Eyler et al. 2002, p. 59; Slacum et al. 2003, p. 13).

Appendix E to Attachment #1
Diagram of Fish Passage Definitions



ATTACHMENT #2
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

MDE American Eel Passage Improvement Plan (MDE-AEPIP)

The Licensee shall construct, operate, and maintain Eel fishways at the Dam to pass upstream migrating Eels that arrive at the Project in a safe, timely, and efficient manner. The Project shall also be operated to provide safe, timely, and effective downstream passage of Eels.

Without limiting the generality of Section 2.C.ii of the Certification, in all cases where this MDE-AEPIP requires the Licensee to consult with or make any submission to MDE, the Licensee shall also consult with, or make such submission to DNR, unless otherwise specified.

A. General Provisions

1. For purposes of this MDE-AEPIP, "Upstream Eel Migration Season" is defined as May 1 through November 1 or when fall mean daily River temperature below the Dam is 10 degrees Celsius or less for three consecutive days, whichever is later.

2. For purposes of this MDE-AEPIP, "Downstream Eel Migration Season" is defined as September 15 through February 15 (or whenever River temperature is above 37 degrees Fahrenheit for four consecutive days).

3. Water temperatures shall be monitored hourly at Station 643 or some other location agreed upon by the Licensee and MDE. This initial operational period is based on preliminary data on Eel migration timing from other tributaries to the Bay.

4. MDE, in consultation with DNR, will use the results from the downstream Eel effectiveness monitoring studies conducted pursuant to Section B.18 of this MDE-AEPIP to further refine the Downstream Eel Migration Period throughout the Term.

B. Eel Passage Requirements and Conditions

1. During the Eel passage season starting May 1, 2019, the Licensee shall document congregations of juvenile Eels visually via bi-weekly nighttime surveys during the migration period, unless another method is approved in writing by MDE. The locations surveyed shall focus on the EFL area including inside the EFL and stilling pool(s) and the Dam spillway adjacent to the EFL. Based on the results of the site-determination studies and engineering analysis, the Licensee shall submit an Eel siting report by February 1, 2020 and then shall design, install, operate and maintain temporary mobile traps to inform the potential location of one or more additional permanent Eel trapping facility(s).

2. No later than March 15, 2020, the Licensee shall submit to MDE for approval a plan to construct and operate temporary, exploratory traps at various locations below the Dam, based on the visual assessments, during multiple years, to assess the ability to collect Eels at

locations where they congregate (the "Eel Collection Plan"). Collection facilities for the temporary site determination study shall be similar to those used in the 2011 study conducted by the Licensee. The Eel Collection Plan shall include (a) locations of Eel fishways, (b) description of substrates, (c) attraction flow at the ramps, (d) attraction flow from the spill gates, (e) description of holding tanks, and (f) frequency of trap checks with contingency for likely high collection periods.

3. No later than March 15, 2022, the Licensee shall submit to MDE for approval an "Eel Passage and Restoration Plan", which shall include (a) detailed plans for the design and construction of new permanent East Eel Fishway(s) ("EEF") located in one or more areas that have high potential to capture Eels migrating up the east side of the mainstem River in the Tailrace; (b) details regarding the annual operation and maintenance of all current and proposed Eel Fishways; and (c) proposed attraction flow speed and volume, slopes of the ramps, matting, and methods to reduce predation.

4. The Licensee shall design and install the EEFs within 12 months of MDE approval of the Eel Passage and Restoration Plan, using paired ramps with different substrates, tanks, etc. to provide sufficient capacity for captured Eels. The number of EEFs and their locations, dependent on survey results, will be determined by MDE. If the number of Eels attempting to migrate within an EEF exceeds the maximum capacity of Eels per unit of ramp area, the Licensee shall redesign and construct the EEF to reduce crowding. In addition, the Licensee shall ensure the holding tank has continuous temperature, DO and water flow exchange monitoring devices with alarms that sound in a permanently staffed location if levels of any parameter are outside established limits. Upon observation, the Licensee shall remove, enumerate and report dead Eels. The holding tank shall be designed and operated to hold Eels at densities not exceeding 10 elvers per liter unless otherwise approved by MDE. If deemed necessary by MDE, the Licensee will provide aeration to the holding tanks. Licensee shall provide daily reports to MDE, DNR, and other resource agencies designated by MDE.

5. Upon completion of the EEFs and thereafter as necessary, the Licensee shall consult at least yearly by February 1, with MDE concerning modifications and adjustments to the passage facilities to improve their operation and efficiency and previous year's data.

6. The Licensee shall not make any modifications to any EEF, undertake any construction associated with any EEF, or make any changes to the operation of any EEF without MDE's written approval in advance..

7. Upon modification to any fish lifts, the Licensee shall investigate Eel congregation locations and follow the procedures outlined in Section B.1 of this MDE-AEPIP to assess the need for additional facilities or modification to the existing Eel collection facilities.

8. The Licensee shall include within the Eel Passage and Restoration Plan detailed plans for the conversion of the EEF(s) and the existing West Eel Fishway ("WEF") to volitional passage, which shall be operational by the Upstream Eel Migration Season in 2031 unless MDE states otherwise in writing. Based on the status of Eel passage at the Holtwood, Safe Harbor and York Haven dams and the results of Eel stocking studies, MDE may delay or eliminate the

requirement to convert to volitional passage if the continuation of the trap and transport program is a preferred option for Eel restoration.

9. The Licensee shall operate the existing WEF annually during each Upstream Shad Migration Season in accordance with the approved Eel Passage and Restoration Plan.

10. The Licensee shall operate the WEF and EEF (interchangeably and collectively, the "Eel Fishways") continuously (24 hours per day, 7 days per week) during each Upstream Eel Migration Season during the Term, regardless of whether the Eel Fishways are operated as a trap or a volitional fishway. If the Eel Fishway(s) is located within the EFL during the Shad passage season, the Eel Fishway(s) will be operated at night when the EFL is not lifting unless MDE modifies this requirement in writing.

11. Unless MDE determines that no effective technology is available to enable such testing, the Licensee shall submit to MDE upstream Eel Fishway efficiency studies (each, an "Efficiency Study") for approval, in accordance with this Section B.11. Each Efficiency Study shall be conducted with juvenile Eels in the vicinity and within the Eel Fishways in 2019, or once technology is available, and once every ten years thereafter. Each Efficiency Study shall determine the Eel upstream passage efficiency of all Eel Fishways during the Upstream Eel Migration Season and any issues that impact Eel survival and efficiency through the Eel Fishways. Each Efficiency Study will consist of two components: determining attraction efficiency to the facility and passage efficiency within the facility once an Eel enters the Eel Fishway. If not already tested at the WEF prior to issuance of the Certification, internal Eel Fishway efficiency at the WEF shall be tested in 2019, regardless of testing for attraction and overall passage efficiency. At all other Eel Fishways, internal Eel Fishway efficiency shall be tested in the year immediately after the year in which the Eel Fishway is completed, regardless of testing for attraction and overall passage efficiency. Efficiency Studies will be repeated following all modifications to Eel Fishway operations, physical structures or the fish lifts which impact River flows or the shoreline to evaluate the success of the modifications. If MDE determines that any Efficiency Study cannot be conducted due to the lack of technology, the Licensee shall conduct visual surveys every five years after the Eel Fishway(s) are constructed to locate Eels below the Dam. The Licensee shall provide an annual report on the efficiency or visual study to MDE DNR by December 31 of the study year.

12. Within twelve months after completion of the Eel Fishways on the east side of the Project (at or near the EFL and the east bank of the River), the Licensee will submit to MDE for approval a multi-year study plan to evaluate those facilities, which plan shall include (a) substrate types, (b) attraction flow at each ramp, (c) attraction flow from the EFL attraction flow spill gates, and (d) potential adjustments to the locations of the Eel Fishways.

13. The Licensee shall yearly, or at such other interval as may be approved in writing by MDE, visually assess the numbers and density of Eels using the Eel Fishways during periods when use is anticipated to be high (e.g. increases in discharge or turbidity) to determine if capacity is exceeded.

14. No later than September 1, 2020, the Licensee shall submit to MDE for approval a plan to conduct in-River, post-stocking surveys including one year of baseline (pre-stocking) data to assess the impact of Eel reintroduction into streams (the "Eel Reintroduction Plan"). These post-stocking surveys shall be for three consecutive years and then once every five years thereafter or until MDE agrees in writing to not continue the annual surveys. Provisions in the Eel Reintroduction Plan shall include the following:

(a) Representative stream segments of the tributaries; provided that the Licensee will propose locations and methods for this survey at least one year in advance to MDE for review and approval;
(b) The number, length, and location of transects sampled shall be subject to approval by MDE;
(c) Eels shall be captured by electrofishing or other methods as approved by MDE;
(d) Block netting shall be required on tributary streams; and
(e) Sampling shall include bivalves and crayfish.

During sampling, Licensee shall document the number of Eels captured and collect data from a representative subsample of Eels. Sampled Eels shall be scanned for passive integrated transponder ("PIT") tags and data from recaptured Eels shall be recorded. Captured Eels larger than 200mm will be tagged with PIT tags and released. Should DNR determine that the number of Eels larger than 200mm is excessive, the Licensee shall consult with MDE and DNR to determine if a subsample of Eels may be PIT tagged. Data collected shall include a variety of life history characteristics e.g., length, weight, condition factor and a description of maturity (e.g. elver, yellow phase, silver phase). that can be assessed to determine how well stocked Eels are utilizing the River and tributaries. A portion of the subsample will be sacrificed and examined for age (otolith analysis), gender, and level of *Anguillicoloides crassus* infection.

15. No later than February 1 of each year, beginning in the year after the Eel Reintroduction Plan is implemented, Licensee shall provide MDE an annual report based on the results of the stream surveys performed in the previous year pursuant to the Eel Reintroduction Plan. The report shall include a.description of (a) stream segments surveyed, (b) dispersal of the stocked Eels, (c) estimate the density of stocked Eels, (d) an evaluation of the growth, condition, age, gender, (e) level of infestation with *Anguillicoloides crassus* of Eels, (f) mussel and crayfish survey results.

16. The Licensee shall submit to MDE for approval a plan showing proposed stocking locations for collected Eels to MDE for review 90 days prior to each Upstream Eel Migration Season.

17. Transport of juvenile Eels upstream shall occur as necessary based on the capacity of holding tanks at the Eel Fishways. The holding tanks shall have an automatically engaging back up pump and an alarm that sounds in a daily staffed location if the primary pump malfunctions. The holding tank shall have continuous temperature, DO and gallon/minute water exchange monitoring devices with alarms that sound in a daily staffed location if levels of any parameter are outside of established limits. All Eels shall be moved within one week of capture.

Eels from the holding tank(s) shall be transferred to a transport vehicle equipped with an insulated transport container(s) that shall be covered and aerated. The transport vehicle(s) shall have an automatically engaging back up pump and an alarm that sounds in the cab of the vehicle(s). The transport vehicle shall have continuous temperature and DO monitoring devices with alarms that sound in the vehicle cab if levels of any parameter are outside of established limits. The transport vehicle(s) shall be designed and operated to hold Eels at densities not exceeding 10 juvenile Eels per liter unless otherwise permitted by MDE in writing. Eels shall be trucked to appropriate release locations on the same day of removal from holding. Upon observation, dead Eels shall be removed, enumerated, and reported.

18. The trigger date for initiation of downstream Eel passage studies shall be the date on which MDE, determines that available data indicates that Eels are maturing upstream of the Project in sufficient numbers to require downstream Eel passage studies at the Dam ("Downstream Study Trigger Date"). Within six months after receiving written notice from MDE that the Downstream Study Trigger Date has occurred, the Licensee shall submit to MDE for approval a plan to conduct a silver Eel downstream survival study (the "Downstream Survival Plan"). The Downstream Survival Plan shall (a) be designed to demonstrate continued compliance with the 85% downstream silver Eel survival target; and (b) include ballon tagging study(ies). The Licensee shall provide a report of the study results from implementation of the Downstream Survival Plan within 180 days after the date of study completion. If such results indicate that the Licensee can operate the Project so that it achieves at least 85% downstream passage of Eel through the Project, the Licensee shall incorporate into the Eel Passage and Restoration Plan all operational measures needed to meet this survival rate. If such results do not indicate that the Project can be operated to achieve at least 85% downstream passage survival of Eel, the Licensee shall propose a plan and schedule for mitigation to achieve the maximum possible downstream Eel passage.

19. No later than September 1, 2021, the Licensee shall submit to MDE for approval a plan for implementing radio telemetry monitoring of Eel at the Project year-round for at least three consecutive years (the "Telemetry Plan"). The Telemetry Plan must include route of passage, delay estimates, and project related mortality. If there are an insufficient number of Eels after three years of implementing the approved Telemetry Plan to determine route of passage, delay estimates, and project related mortality, the Licensee shall continue the Telemetry Plan until such determinations can be made.

ATTACHMENT #3
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

MDE Invasive Species Mitigation Plan (MDE-ISMP)

In order to minimize the introduction and spread of aquatic invasive species ("AIS") into the River through the fish lifts at the Dam, the Licensee shall, beginning in September of 2018:

1. The Licensee shall notify DNR and USFWS in accordance with Section 7 of this MD-ISMP if an AIS is (a) collected in the WFL, (b) collected in the EFL, or (c) passed in the EFL into the Reservoir.

2. During EFL Operations, the Licensee shall:

   (a) View the hopper dumping into the fish exit trough. If an AIS is viewed in the hopper or chute, close the gate at the viewing window immediately, and institute a draw-down to remove the AIS from the trough before releasing the remaining fish into the Reservoir.

   (b) Remove any AIS that are observed while conducting tagging operations in the EFL trough.

3. During WFL Operations, the Licensee shall remove any invasive species that are collected in the WFL.

4. The Licensee shall also:

   (a) Retrofit/redesign the EFL no later than March 1, 2019 to remove AIS and allow tagging fish when required.

   (b) Design fishlifts to remove all AIS prior to upstream migration or Tailrace reintroduction while not significantly impacting fish passage.

   (c) Ensure the proper disposal of all AIS captured in the fish lifts.

5. MDE may require the Licensee to implement the following protocol beginning in the 2019 migratory fish passage season that starts when River temperatures reach 48 degrees for three consecutive days and ends when River temperatures rise above 72 degrees for four consecutive days:

   (a) For all AIS collected at the Dam, Licensee shall kill or dispatch the AIS and place it in the freezer used for Shad heads during the tank spawning studies, for DNR and/or USFWS to dispose of such AIS.

(b) If freezer space for storage of AIS becomes limited the Licensee shall notify MDE and DNR.

(c) If freezer space for storage of AIS is not limited, at the end of the season, Licensee shall send the frozen AIS with the Shad heads to the Van Dyke Hatchery and notify MDE and DNR as to the number and type of frozen AIS sent to the Van Dyke Hatchery.

6. MDE reserves the right to adaptably modify conditions for invasive species control, based on a sound science and after consultation with DNR, USFWS and the Licensee. Licensee shall implement any modifications to these conditions as required by MDE on a schedule established by MDE.

7. Agency Notification Protocol: If an AIS is captured and removed or passed in a fish lift, the Licensee shall notify DNR and USFWS within 24 hours. Notification shall include: (a) species name and number observed/collected; (b) disposition of the AIS observed/collected; (c) approximate size of AIS observed/collected; (d) date and time of passage; and (e) estimated flow through the Dam at time of passage.

ATTACHMENT #4
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

Minimum Flow Regime

Time Period	Minimum Flow
January	4,000 cfs
February	4,000 cfs
March	4,000 cfs
April	18,200 cfs
May	18,200 cfs
June	7,500 cfs
July	5,500 cfs
August	4,500 cfs
September 1-14	3, 500 cfs
September 15-30	3,500 cfs
October	4,000 cfs
November	4,000 cfs
December	4,000 cfs

ATTACHMENT #5
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

Year 10 Flow Regime

For purposes of the following table, "below normal" at the Marietta Gage means flow less than monthly Q50, and "above normal" means flow greater than or equal to monthly Q50.

Month(s)	Min Flow	Down Ramping Rate	Upramping Rate	Maximum Flow
December-January	11,000 cfs	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
February	12,500 cfs	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
March	24,000 cfs when upstream inflow at the Marietta Gage is below normal; 30,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
April	29,000 cfs when upstream inflow at the Marietta Gage is below normal; 35,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
May	17,500 cfs when upstream inflow at the Marietta Gage is below normal; 25,500 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
June	10,000 cfs when upstream inflow at the Marietta Gage is below normal; 14,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
July	5,500 cfs when upstream inflow at the Marietta Gage is below normal; 8,500 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 10,000 cfs/hour if instream flow is less than 30,000 cfs; Up to 20,000 cfs/hour if upstream flow is between 30,000 and 86,000 cfs	Up to 40,000 cfs/hour	65,000 cfs
August	4,500 cfs when upstream inflow at the Marietta Gage is below normal; 6,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
September	3,500 when upstream inflow at the Marietta Gage is below normal; 5,500 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
October	4,500 cfs when upstream inflow at the Marietta Gage is below normal; 6,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
November	6,000 cfs when upstream inflow at the Marietta Gage is below normal.; OR 11,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None

Maryland
Department of
the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

May 8, 2018

Via FERC eFiling

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, D.C. 20426

Re: FERC Project No. 405, Sub-docket 106 – Conowingo Hydroelectric Project

Dear Secretary Bose:

As requested by the FERC Office of Energy Projects, enclosed please find a copy of the Water Quality Certification issued by the Maryland Department of the Environment ("MDE") pursuant to Section 401 of the Clean Water Act for the above-referenced project (the "WQC").

MDE issued the WQC to Exelon Generation Company, LLC on April 27, 2018 in response to their application dated May 17, 2017. The WQC will also be published in the *Maryland Register* on May 11, 2018.

If you wish to discuss this matter, please contact me at (410) 537-3084 or by e-mail at *ben.grumbles@maryland.gov*.

Sincerely,

Ben Grumbles
Secretary

MARYLAND DEPARTMENT OF THE ENVIRONMENT

Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

Certification Issued To:

Exelon Generation Company, LLC
300 Exelon Way
Kennett Square, PA 19348

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Attachments:

1. MDE Fish Passage Improvement Plan

    Appendix A – Calculation of Fishway Capacity for a 6,500 Gallon Hopper
    Appendix B – Calculating Trap and Transport Credit
    Appendix C – Trap and Transport Mortality Study
    Appendix D – Upstream and Downstream Migration Periods for Certain Species
    Appendix E – Diagram of Fish Passage Definitions

2. MDE Eel Passage Improvement Plan

3. MDE Invasive Species Mitigation Plan

4. Minimum Flow Regime

5. Year 10 Flow Regime

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1. Authority

This Certification is issued to Exelon Generation Company, LLC (the "Licensee") by the Maryland Department of the Environment ("MDE" or the "Department") pursuant to Section 401 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §1341 et seq. (the "Clean Water Act"), Title 9, Subtitle 3 of the Environment Article, and Section 26.08.02 of the Code of Maryland Regulations ("COMAR"), with respect to the Conowingo Hydroelectric Project, FERC Project Number P-405 (the "Project").

2. Definitions and Administrative Provisions

A. Definitions

In addition to terms defined elsewhere in this Certification, the following terms have the following meaning when used in this Certification and the Attachments hereto:

"Application" means that certain Application for a Maryland Water Quality Certificate for the Conowingo Hydroelectric Project submitted to the Department by the Licensee with respect to the Project on May 17, 2017, as amended, supplement, or modified.

"Authorization" means any applicable license, permit, approval, consent, exemption or authorization from a federal, State or local governmental authority.

"Bay" means the Chesapeake Bay and its tidal tributaries.

"cfs" means cubic feet per second.

"CPI" means the Consumer Price Index for All Urban Consumers (CPI-U; U.S. City Average; all items, not seasonally adjusted; 1982-84=100 reference base) published from time to time by the U.S. Bureau of Labor Statistics.

"Dam" means the Conowingo Dam, as described in Section 1.1 of the FERC Application.

"DNR" means the Maryland Department of Natural Resources.

"DO" means dissolved oxygen.

"DO Non-Attainment Area" means the portion of the Bay consisting of Chesapeake Bay segments CB4MH (Middle Central Chesapeake Bay Mesohaline deep water and deep channel) and the Maryland portion of CB5MH (Lower Central Chesapeake Bay Mesohaline deep water).

"DOI" means the United States Department of the Interior.

"EAV" means emergent aquatic vegetation.

"Eel" means American eel (*Anguilla rostrata*).

"East Fish Lift" or "EFL" means the east fish lift at the Project.

"Environment Article" means the Environment Article of the Annotated Code of Maryland.

"FERC" means the Federal Energy Regulatory Commission.

"FERC Application" means that certain Application for New License for Major Water Power Project-Existing Dam submitted to FERC by the Licensee with respect to the Project on or about August 9, 2012, as amended, supplemented, or modified.

"Herring" means, interchangeably and collectively, alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*).

"Holtwood" means the Holtwood Hydroelectric Project, FERC Project Number 1881.

"Laws" means applicable laws, statutes, regulations, rules, administrative orders, and judicial orders.

"Lower River" means the River from the Dam to its confluence with the Bay.

"Marietta Gage" means the water stage gage located on the River approximately one mile downstream of Marietta, Pennsylvania, USGS station #01576000.

"MDE-AEPIP" means the MDE American Eel Passage Improvement Plan, set forth in Attachment #2 to this Certification, which is incorporated herein by reference.

"MDE-FPIP" means the MDE Fish Passage Improvement Plan, set forth in Attachment #1 to this Certification, which is incorporated herein by reference.

"MDE-ISMP" means the MDE Invasive Species Mitigation Plan, set forth in Attachment #3 to this Certification, which is incorporated herein by reference.

"Minimum Flow Regime" means the operational flow requirements set forth in Attachment #4 to this Certification, which is incorporated herein by reference.

"Muddy Run" means the Muddy Run Pumped Storage Project, FERC Project Number 2355.

"New License" means the license for the Project to be issued by FERC.

"NMFS" means the National Marine Fisheries Service.

"Peach Bottom" means the Peach Bottom Atomic Power Station.

"PCBs" means polychlorinated biphenyls.

"ppt" means parts per thousand.

"Reservoir" means the water impounded by the Dam, which is sometimes referred to as the Conowingo Pond or Conowingo Pool.

"River" means the Susquehanna River.

"Safe Harbor" means the Safe Harbor Hydroelectric Project, FERC Project Number 1025.

"SAV" means submerged aquatic vegetation.

"Secretary" means the Secretary of the Environment of the State of Maryland, and any successor thereto.

"Shad" means American shad (*Alosa sapidissima*).

"Shoreline Management Plan" or "SMP" means the Licensee's Shoreline Management Plan dated August 2012, included the Application and in Volume 3 of the FERC Application, which is incorporated herein by reference.

"Station 643" means DO and temperature monitoring station 643, located approximately 0.6 miles downstream of the Dam, which was established at such location by the Licensee in consultation with DNR.

"Sturgeon" means Atlantic and shortnose sturgeon (*Acipenser brevirostrum, Acipenser oxyrinchus oxyrinchus*).

"Tailrace" means the area downstream of the Dam that is in the hydraulic influence of Project operations.

"Tailwaters" means the Tailrace, extending to the downstream tip of Rowland Island.

"Term" means the term of the New License.

"TMDL" means a total maximum daily load for a body of water, pursuant to the Clean Water Act.

"USFWS" means the United States Fish and Wildlife Service.

"West Fish Lift" or "WFL" means the west fish lift at the Project.

"Year 10 Flow Regime" means the operational flow requirements set forth in Attachment #5 to this Certification, which is incorporated herein by reference.

"WQS" means applicable Maryland water quality standards.

B. Construction and Interpretation

All references herein to Sections or Attachments are references to Sections of or Attachments to this Certification, unless otherwise indicated. All Attachments to this Certification are deemed to be incorporated by reference and made a part of this Certification. All documents incorporated by reference into this Certification that are not attached hereto are qualified by the provisions, requirements and conditions of this Certification. Whenever the words "include," "includes," or "including" are used in this Certification, they shall be deemed to be followed by the words "without limitation." Every reference herein to any Law shall be deemed to be a reference to such Law as it may be amended, supplemented, modified, renumbered, or re-codified from time to time. The Table of Contents and Section headings contained in this Certification (including the Attachments hereto and documents incorporated herein by reference) are for convenience only and shall not in any way affect the meaning or interpretation of this Certification. All references herein to temperatures are expressed in degrees Fahrenheit, unless otherwise noted. All references herein to "days" are calendar days unless otherwise noted. All references herein to governmental entities are to such governmental entities and any successor(s) thereto.

C. Plans

Where the Licensee is required by this Certificate (including any Attachment hereto) to submit to MDE for review and approval any plans, reports, or other documents, including the NCAP (defined below), the 643 Monitoring Plan (defined below), the Fish Kill Monitoring Plan (defined below), the Chlorophyll-A Monitoring Plan (defined below), the Chlorophyll-A Reduction Plan (defined below), the SMP Updates (defined below), the Bog Turtle Plan (defined below), the Map Turtle Plan (defined below), the Waterfowl Plan (defined below), the Tailrace Gage Plan (defined below), the Sturgeon Plan (defined below), the HIP Plan (defined below), the Fish Protection Plan (defined below), the FPP Updates (defined below), and the Stranding Minimization Plan (defined below) (each, a "Plan"), the following procedures shall apply, unless otherwise specified in this Certification:

i. MDE may approve any Plan, in whole or in part, or decline to approve it and provide written comments. MDE may also request additional information. The Licensee shall consult with MDE at least thirty (30) days prior to submission of any Plan about the subject matter thereof. To be effective, any approval by MDE hereunder must be provided in writing.

ii. MDE may solicit public comments and may hold, or require the Licensee to hold, one or more public hearings or meetings with respect to any Plan submitted by the Licensee. MDE may consult and share relevant information with, and may require the Licensee to consult and share relevant information with, other governmental entities or third parties having particular expertise in connection with the review, implementation, and/or oversight of any Plan, including DNR, USFWS, NMFS, the Susquehanna River Basin Commission and the Eel Passage Advisory Group. In connection with each proposed Plan, the Licensee shall provide MDE with (a) documentation regarding consultation with other governmental entities and third parties, (b) an explanation of how the proposed Plan addresses comments or recommendations from governmental entities or third parties, and (c) an explanation of why any such comments or recommendations are not addressed in the proposed Plan.

iii. Upon approval by MDE in writing, the Plan is incorporated into this Certification, and Licensee shall comply with such Plan as approved by MDE. Any failure to comply with an approved Plan, including any deadlines set forth therein, shall be deemed noncompliance with this Certification.

iv. In the event of MDE's disapproval, in whole or in part, of any Plan, MDE shall specify any deficiencies in writing to the Licensee. The Licensee shall correct the deficiencies within thirty (30) days from receipt of disapproval by MDE unless MDE grants an extension, and submit the corrected Plan to MDE for review.

v. If the Licensee takes exception to all or part of MDE's disapproval of any Plan, the Licensee shall submit a written statement of the grounds for the exception to MDE within fifteen (15) days from receipt of disapproval by MDE. Representatives of MDE and the Licensee may confer in person or by telephone in an attempt to resolve any disagreement. If a resolution is reached, that resolution shall be reduced to writing and signed by representatives of each party. In the event that resolution is not reached within fifteen (15) days, unless MDE grants an extension, the Licensee shall modify the Plan as required by MDE.

vi. Each Plan shall include (a) periodic reporting by the Licensee to MDE at such intervals as MDE deems reasonably necessary; and (b) a timeline for implementation of the Plan.

vii. The Licensee shall (a) provide all data and reports, including monitoring results, collected or developed pursuant to any Plan to MDE in electronic format, (b) make all such data and reports publically available on the Web Portal (defined below), (c) make all Plans publicly available on the Web Portal contemporaneously with submission thereof to MDE, and (d) make all approved Plans publicly available on the Web Portal upon receiving approval thereof from MDE.

viii. To the extent any Plan requires sampling, the number of samples, techniques used to obtain samples, and sampling locations shall be subject to approval by MDE.

3. Certification

The Department hereby certifies that the Project's operations and discharge into navigable waters will comply with applicable effluent limitations, other limitations, and water quality standards and requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State Law, provided that Licensee complies with all of the provisions, requirements, and conditions in this Certification.

4. Summary Project Description

The Project consists of (1) the Dam, (2) a spillway, (3) the Reservoir, (4) an intake and powerhouse, and (5) the West Fish Lift and the East Fish Lift, all of which are located on the River approximately 10 miles north of the River's confluence with the Bay.

The West Fish Lift, adjacent to the Dam's right abutment, is currently operated under an agreement with USFWS for Shad egg production and other research purposes. The newer East Fish Lift, located near the midpoint of the Dam, is used primarily to pass Shad, Herring, and other migratory fish during the March-June migration season. The Project also includes a new Eel passage facility on the west side that began operation in May 2017.

The Reservoir serves as the lower reservoir for Muddy Run. It also serves as the source of cooling water for Peach Bottom and the York Energy Center. The Reservoir is also a public water supply source, with the City of Baltimore and Chester Water Authority (in Pennsylvania) having permitted withdrawals of 250 million gallons per day and 30 million gallons a day, respectively.

The powerhouse is integrated with the Dam. There are 13 turbine-generator units, associated draft tubes, and transformer bays. Water flowing through the turbines is discharged via the draft tubes into the Tailrace.

The Project area includes 15 recreation facilities and public access areas: Lock 13, Lock 15, Muddy Creek Boat Launch, Cold Cabin Boat Launch, Dorsey Park, Line Bridge, Broad Creek Public Landing, Glen Cove Marina, Conowingo Swimming Pool and Visitor's Center, Peach Bottom Marina, Conowingo Creek Boat Launch, Funk's Pond, Conowingo Dam Overlook, Fisherman's Park/Shures Landing, and Octoraro Creek Access.

5. Applicable Maryland Water Quality Standards & Criteria

A. Reservoir

The Reservoir has been designated as a Class I-P water, i.e., the Reservoir is to be used for water contact recreation, habitat for non-tidal warmwater aquatic life, and public water supply. The water quality criteria that are currently applicable to the Reservoir and relevant to this Certification are:

i. DO of at least 5 mg/L;

ii. Bacteriological criteria;

iii. PCBs in fish tissue;

iv. Chlorophyll-A (10 ug/l 30 day average, 90th percentile not greater that 30 ug/l);

v. Turbidity (150 max, 50 average); turbidity levels may not exceed levels detrimental to aquatic life;

vi. pH (6.5-8.5);

vii. Temperature (not to exceed 90 degrees); and

viii. Narrative criterion that prohibits waters from being polluted with any material in amounts sufficient to: (1) be unsightly; (2) produce taste or odor; (3) change the existing color to produce aesthetically objectionable color; (4) create a nuisance; or (5) interfere directly or indirectly with designated uses.

B. Downstream

The discharge from the Project impacts water quality in the River below the Dam and in the Bay. Applicable water quality standards for these waters, including designated uses, relevant to this Certification are as follows:

i. *The mainstem of River from the Dam to the confluence with the Bay.* This water has been designated as a Class II-P water. This water is to be used for water contact recreation, public water supply, habitat for non tidal warmwater aquatic life, estuarine and marine aquatic life and shellfish harvesting, migratory spawning and nursery, seasonal shallow water submerged aquatic vegetation (SAV), and Open-Water Fish and Shellfish. The water quality criteria which are currently applicable to this water and relevant to this Certification include:

a. Narrative criterion that prohibits the water from being polluted with any material in amounts sufficient to: (1) be unsightly; (2) produce taste or odor; (3) change the existing color to produce aesthetically objectionable color; (4) create a nuisance; or (5) interfere directly or indirectly with designated uses; and

b. DO criteria for Class II-P waters are the same as Class I-P waters ("the [DO] concentration may not be less than 5 milligrams/liter at any time"), except for the following subcategories applicable in the reach downstream of Dam:

    1. Seasonal and Migratory Fish Spawning and Nursery: From February 1 through May 31, the DO level must be greater than or equal to 6 milligrams/liter (mg/l) for a 7-day averaging period, with an instantaneous minimum requirement of greater than or equal to 5 mg/l. For all other times during the year, the DO levels are as follows: (A) greater than or equal to 5.5 [mg/l] for a 30-day averaging period . . . in tidal fresh waters (salinity less than or equal to 0.5 ppt); (B) greater than or equal to 5 [mg/l] for a 30-day averaging period . . . (salinity greater than 0.5 ppt); (C) greater than or equal to 4.0 [mg/l] for a 7-day averaging period; (D) greater than or equal to 3.2 [mg/l] as an instantaneous minimum; and (E) for protection of the endangered shortnose sturgeon, greater than or equal to 4.3 [mg/l] as an instantaneous minimum at water column temperatures greater than 77 degrees;

    2. Seasonal Shallow-Water SAV: Same as items (A) through (E) in Section 5.B.i.b.1, year-round; and

    3. Open-Water Fish and Shellfish: Same as items (A) through (E) in Section 5.B.i.b.1, year-round;

c. Temperature (not to exceed 90 degrees);

d. pH: Normal pH values may not be less than 6.5 or greater than 8.5;

e. Turbidity may not exceed levels detrimental to aquatic life. With regard to turbidity resulting from any discharge, such turbidity "may not exceed 150 units at any time or 50 units as a monthly average" (measured in Nephelometer Turbidity Units);

f. Color in the surface water may not exceed 75 units as a monthly average. Units shall be measured in Platinum Cobalt Units;

g. Concentrations of chlorophyll a in free-floating microscopic aquatic plants (algae) may not exceed levels that result in ecologically undesirable consequences that would render tidal waters unsuitable for designated uses; and

h. Class II-P waters are subject to MDE's toxic substances criteria for protection of fresh water and freshwater-adapted estuarine aquatic organisms and to protect public water supplies and the wholesomeness of fish and shellfish for human consumption (MDE's regulations set forth criteria for some 112 toxic substances, including inorganic substances, organic compounds, polycyclic aromatic hydrocarbons and phthalates, and pesticides and chlorinated compound).

ii. *The Bay*. The Bay has designated uses of aquatic life, fishing, seasonal migratory fish spawning and nursery, seasonal shallow water SAV uses from April 1 to October 30 to a depth of 1 meter, open-water fish and shellfish uses, seasonal deep-water fish and shellfish, seasonal deep-channel refuge, and narrative criteria that prohibits waters from being polluted by materials or substances which are unsightly, putrescent, odorous, create a nuisance, or interfere directly or indirectly with designated uses. The numeric water quality criteria that are currently applicable and most relevant to this Certification are the DO criteria (and in particular, the DO criteria for the DO Non-Attainment Area), including:

a. Seasonal Migratory Fish

1. From February 1-May 31: DO must be greater than or equal to 6 mg/L for a 7 day averaging period with an instantaneous minimum requirement of greater than or equal to 5 mg/L; and

2. From June 1-January 31: Same as Open-Water Fish and Shellfish.

b. Open-Water Fish and Shellfish:

1. DO must be greater than or equal to 5.5 mg/L for a 30 day average (salinity less than or equal to 0.5 ppt);

2. DO must be greater than or equal to 5.0 mg/L for a 30 day average (salinity greater than 0.5 ppt);

3. DO must be greater than or equal to 4.0 mg/L for a 7 day averaging period and greater than or equal to 3.2 mg/L as an instantaneous minimum; and

4. For protection of shortnose sturgeon, DO must be greater than or equal to 4.3 mg/L as an instantaneous minimum when water column temperatures exceed 77 degrees.

c. Seasonal Shallow-Water SAV: Year-round, same as Open-Water Fish and Shellfish.

d. Seasonal Deep Water Fish and Shellfish:

1. DO must be greater than or equal to 3.0 milligrams/liter for a 30-day averaging period from June 1 through September 30;

2. DO must be greater than or equal to 2.3 milligrams/liter for a 1-day averaging period from June 1 through September 30;

3. DO must be greater than or equal to 1.7 milligrams/liter as an instantaneous minimum from June 1 through September 30; and

4. The open-water fish and shellfish subcategory criteria apply from October 1 to May 31.

e. Seasonal Deep Channel Refuge: DO must be greater than or equal to 1.0 milligrams/liter as an instantaneous minimum from June 1 to September 30 except for Bay segments subject to variances.

6. Summary of Findings

In light of all the evidence before the Department, including the Application, comments and testimony received, and all other studies, modeling, and information reviewed during the Application review process, the Department has determined that the Project adversely impacts water quality in the State of Maryland, including but not limited to the following ways:

A. The Project has significantly and adversely impacted biota in the Lower River and the northern Bay over the past 90 years of operation, as a result of: (i) its highly unnatural operational flow regimes; (ii) the Dam serving as a barrier to fish passage upstream; and (iii) the Dam serving as an obstacle to fish passage and coarse-sediment transport for habitat downstream. Aquatic habitat in the Tailrace is adversely affected by daily peaking flows and the elimination of movement of some coarse-grained sediments that are stored in the Reservoir. Daily peaking hydropower operation also results in high velocities and excessive turbulence in water discharged through the Dam, which reduces deposition of any available coarse-grained sediment and affects the amount of Lower River habitat available to species such as Shad, Herring, Sturgeon, Eels, turtles, and freshwater mussels, as well as SAV and macro-invertebrate communities.

B. 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 were adversely impacted. The duration of time before the Project was required to maintain any amount of daily minimum flow downstream throughout the year, and before any working fishlift was constructed to allow fish to move by their own volition upstream, has had significant consequences for the health of the aquatic system from above the Dam to the northern Bay.

C. 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.

D. Additional provision for fish passage is necessary to assist in the recovery of historic fish populations. Prior to the construction and operation of the Project, species such as Shad and Herring spawned in prime spawning habitat in the River above the current location of the Dam. The River and northern Bay were vibrant and active fisheries for these species. With a healthy aquatic system, millions of Shad and Herring should be passing upstream in the River every year; in 2017, only 15,000 Shad and 65 Herring passed the Dam. Millions of Eel, an important host species for freshwater mussels that filter pollution out of waters, should be present in the Lower River, including areas upstream of the Dam; in 2017, only thousands were collected at the base of the Dam and transported upstream. Consequently freshwater mussel populations have declined dramatically in the 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.

E. The Reservoir, formed by the construction of the Project, replaced 14 miles of flowing, dynamic River habitat with an impoundment and fundamentally altered aquatic habitat. The Reservoir lacks suitable habitat for freshwater mussels, which has adverse consequences for water quality, as these organisms provide important ecosystem services of filtration and transformation of sediment and nutrient pollution. Reservoir-adapted fish such as gizzard shad have replaced and continue to threaten populations of riverine species that would typically be dominant. The Reservoir has elevated levels of chlorophyll-A during summer months with increased water temperatures, which impact drinking water supply uses of the water. Elevated PCB levels in fish tissue in fish in the Reservoir and below the Dam impact fish consumption-related uses, and have triggered the development of TMDLs to address these impairments.

F. Invasive fish species, which may be more likely to proliferate in a degraded system, passing the Dam have the potential to suppress native species, alter the food web, and reduce biodiversity. Invasive species including the blue catfish (*Ictalurus furcatus*) and northern snakehead (*Channa argus)* have spread throughout the Bay watershed. Based on information from Licensee, a snakehead or blue catfish has already passed volitionally through a fishlift at the Project in 2017. The blue catfish and snakehead are both top predators in areas where they have become established and would further threaten the ecological balance of the River.

G. Although the Dam has in the past trapped and stored sediment and nutrients and served as a barrier to downstream transport to the Bay, the Reservoir is now full, as no efforts have been undertaken over the life of the Project, such as routine dredging, to maintain any trapping function. As a result, sediments and nutrients move downstream, and during large storm events, significant amounts of trapped sediment and nutrients are scoured from the behind the Dam and discharged downstream. By releasing significant amounts of sediment and nutrients through scouring during storm events, the Dam has altered the nature, timing, and delivery method of these materials with adverse consequences for the Lower River and the Bay. Nutrients discharged as a result of the in-filled state of the Reservoir adversely impact DO levels and thus aquatic life in the DO Non-Attainment Area.

H. In-filling of the Reservoir with sediment increases the velocity of water in the Reservoir, and the altered hydrological dynamics result in unfavorable substrate conditions and a

generally sparse invertebrate community in the lower two-thirds of the Reservoir. Increased water velocity also increases bed shear and induces additional scour and movement downstream of sediment and associated nutrients.

I. The Project traps trash and debris behind the Dam, which accumulates over time, threatening recreational uses of the Reservoir and potentially concentrating pollutants, and if not removed regularly is vulnerable to sudden downstream transport during moderate to large storm events. Significant amounts of trash and debris moving downstream in single events creates hazards for recreational uses and blocks water supply intakes downstream.

J. Absent the Dam, there would be 24 miles of open river between the dam at Holtwood and the Bay, and there would be some natural transformation and attenuation of sediment and nutrients, as the River would be better connected to its floodplain and there would be coarse sediment regularly moving downstream. This would support larger SAV beds, and the area downstream of the head of tide (about 5 miles from the mouth of the River) would have a larger delta formed from deposition of sediment carried by the River as its flow enters the slower moving water in the Bay. More coarse sediment, floodplain connection, and SAV would make the River system more resilient, including its ability to attenuate nutrients and minimize damage associated with moderate to large rainfall events.

7. Requirements and Conditions

A. Compliance with WQS, Generally

The Project shall comply with all WQS and other applicable Laws and Authorizations.

B. Fish Passage

i. The Licensee shall implement and comply with all provisions of:

(a) the MDE-FPIP;

(b) the MDE-AEPIP; and

(c) the MDE-ISMP.

ii. The Licensee shall take such actions as may be necessary to permit at least 5,000,000 Shad and at least 12,000,000 Herring that approach the Project to pass the Dam each year during the Term on a schedule to be determined by MDE as the Licensee implements the MDE-FPIP.

iii. Notwithstanding any provision of the MDE-FPIP to the contrary, if the Shad population immediately upstream of York Haven Dam is determined to be less than 150,000 (using a counting methodology approved by MDE) as of December 31, 2039, MDE will reassess the trap and transport crediting aspects of the MDE-FPIP, and MDE will decide, in consultation with DNR and, as MDE deems appropriate, other fisheries experts, whether and

how to adjust such crediting. The Licensee shall be bound to apply whatever adjustments that MDE makes at that time to the crediting aspects of the MDE-FPIP from that point forward.

iv. Notwithstanding any provision of the MDE-FPIP to the contrary, if the Shad population immediately upstream of York Haven Dam is determined to be less than 400,000 (using a counting methodology approved by MDE) as of December 31, 2054, MDE will reassess the trap and transport crediting aspects of the MDE-FPIP, and MDE will decide, in consultation with DNR and, as MDE deems appropriate, other fisheries experts, whether and how to adjust such crediting. The Licensee shall be bound to apply whatever adjustments that MDE makes at that time to the crediting aspects of the MDE-FPIP from that point forward.

C. Aquatic Life and Seasonal Migratory Fish - Operational Flow Regime Impacts

i. The Licensee shall operate the Project in accordance with the Minimum Flow Regime beginning on September 1, 2018 and ending on December 31, 2028.

ii. The Licensee shall operate the Project in accordance with the Year 10 Flow Regime starting on January 1, 2029, *provided, however*, if MDE determines, based on Adaptive Management Flow Studies, that modifications to the Year 10 Flow Regime are likely to result in benefits to the aquatic system greater than or equal to the benefits MDE expects if the Year 10 Flow Regime is implemented without such modifications, the Secretary will notify the Licensee of such determination in writing prior to January 1, 2029, in which case the Licensee shall operate the Project in accordance with the Year 10 Flow Regime, modified in accordance with such notice from the Secretary (the "Modified Year 10 Flow Regime"), starting on January 1, 2029.

iii. For purposes of this Section 7.C, "benefits to the aquatic system" includes statistically significant improvement in (a) the percentage of Shad and Herring moving from the Tailrace and being captured in the fishlifts within three days of their entry 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 within the segment of the River between the Project and the head of tide.

iv. For purposes of this Section 7.C, "Adaptive Management Flow Studies" means scientifically sound studies voluntarily completed by or for the Licensee as described more fully below, subject to independent external scientific peer review and submitted by the Licensee to MDE. For each Adaptive Management Flow Study, the Licensee shall develop a study design, with the objective of testing one or more component parts of the Year 10 Flow Regime to determine whether such component part(s) provide benefits to the aquatic system. The Licensee shall subject the study designs to independent external scientific peer review by at least five qualified and independent scientists with specialties in the appropriate scientific disciplines, and incorporate any consensus recommendations into the study design as a result of that process. The Licensee shall provide to MDE for approval a copy of each final study design with the results of the independent external scientific peer review prior to initiating the Adaptive Management Flow Study. For each Adaptive Management Flow Study, a report containing the data collected and an analysis of results shall be subjected to independent external scientific peer

review by at least five qualified and independent scientists with specialties in the appropriate scientific disciplines. Once independent external scientific peer review of the Adaptive Management Flow Study results is completed, the Licensee shall incorporate and/or address any consensus-based comments and provide to MDE the study report and copies of all independent external scientific peer review comments. The study report and the results of independent external scientific peer review shall be submitted to MDE by January 1, 2027, so that MDE has adequate time to review and consider the need for potential changes to the Year 10 Flow Regime.

v. If compliance with the Minimum Flow Regime, the Year 10 Flow Regime, or the Modified Year 10 Flow Regime, as the case may be (each, "Applicable Flow Requirements"), would cause the Licensee, any of its affiliates, or any subsequent owner or operator of Peach Bottom or Muddy Run to violate or breach any Law, Authorization, or agreement with any governmental entity, including the Nuclear Regulatory Commission license for Peach Bottom and any agreement with the City of Baltimore, the Licensee may deviate from the Applicable Flow Requirements to the least degree necessary in order to avoid such violation or breach. In such circumstances, the Licensee shall provide to MDE, within one week of each such deviation, a written report identifying the Law, Authorization, or agreement that necessitated the deviation, describing the actual minimum flows provided during the deviation period, the duration of the actual minimum flows under these circumstances, and any observed adverse impacts to aquatic life (e.g., fish kills, additional observed delays in migratory fish reaching the fishlifts, etc.).

D. Dissolved Oxygen (DO) in the Chesapeake Bay

i. The Licensee shall ensure that Project operations and discharges do not adversely impact DO levels, and consequently aquatic life, in the Bay in any manner that would constitute a violation of WQS including designated and achieved uses.

ii. To ensure the Project's compliance with DO WQS including designated and achieved uses, beginning with calendar year 2025, the Licensee shall annually reduce the amount of nitrogen included in the Project's discharges by six million (6,000,000) pounds and the amount of phosphorus in the Project's discharges by two hundred sixty thousand (260,000) pounds (or such different amounts of phosphorus and nitrogen reductions as may be approved by MDE, provided that such different amounts of nitrogen and phosphorus reductions provide the equivalent protection of DO levels in the DO Non-Attainment Area that would be provided by six million (6,000,000) pounds of nitrogen reductions and two hundred sixty thousand (260,000) pounds of phosphorus reductions) (the "Required Nutrient Reductions").

iii. If, in a final watershed implementation plan intended to mitigate the water quality impacts of the Reservoir in-fill (the "Conowingo WIP"), one or more of Maryland, the District of Columbia, New York, Delaware, Virginia, West Virginia, and Pennsylvania (each, a "Bay Jurisdiction") has committed to actions that will result in some portion(s) of the Required Nutrient Reductions being achieved, the Licensee may credit against its Required Nutrient Reduction obligation the nitrogen and/or phosphorus reductions that are actually achieved by the Bay Jurisdictions. To obtain any such credit, the Licensee shall submit a written request therefor, with supporting documentation, to MDE.

iv. The Licensee shall provide to MDE for review and approval, no later than December 31, 2019, a nutrient corrective action plan (the "NCAP") for achieving the Required Nutrient Reductions and otherwise ensuring that DO levels in the DO Non-Attainment Area are not adversely impacted by Project operations and discharges. The NCAP may propose any combination of corrective action strategies, including:

(a) Payment of an in-lieu fee annually at $17.00 per pound of nitrogen and $270.00 per pound of phosphorus in accordance with payment instructions provided by MDE from time to time; *provided*, that the in-lieu fee amounts of $17.00 and $270.00 are deemed effective as of January 1, 2019 and shall be adjusted for inflation on January 1, 2020 and on January 1 of each year thereafter, based on the cumulative change in the CPI;

(b) Installation of best management practices and/or ecosystem restoration actions (e.g., restoration of buffers, land conservation, stream and wetland restorations, re-forestation, and/or freshwater mussel and oyster restoration); and/or

(c) Dredging the Reservoir, subject to Licensee obtaining all necessary Authorizations for such dredging.

v. Subject to the other provisions of this Section 7.D.v, the Licensee shall comply with the NCAP as approved by MDE in writing during the Term. If MDE determines during the Term that the Required Nutrient Reductions are, in whole or in part, either not necessary or not sufficient to meet DO criteria in the River and/or the Bay, MDE may re-open this Certification pursuant to Section 7.Q.xvii to reduce, eliminate, or increase the Required Nutrient Reductions. If MDE re-opens this Certification to increase or reduce the Required Nutrient Reductions, the Licensee shall submit a revised NCAP to MDE for approval within 60 days after MDE notifies the Licensee in writing that this Certification is being re-opened.

vi. The Licensee shall develop and submit for MDE review and approval no later than December 31, 2019, a Sediment & Nutrient Monitoring Plan, the purpose of which shall be to: (a) quantify changes in the extent and amount of sediment and nutrients being discharged from the Dam over the Term; (b) understand the impacts of changing sediment and nutrient conditions on living resources in the Bay; and (c) understand nutrient and sediment changes and impacts resulting from major storm events of greater than 400,000 cfs.

E. DO in the River Downstream of the Dam as Measured at Station 643

i. The Licensee shall ensure that Project operations and discharges do not adversely impact DO levels, and consequently aquatic life, in the River in any manner that would constitute a violation WQS including designated and achieved uses.

ii. No later than June 30, 2019, the Licensee shall submit to MDE for approval a plan for monitoring DO at Station 643 (the "643 Monitoring Plan"). The 643 Monitoring Plan shall provide for continuous monitoring of DO levels in the Tailrace at Station

643 beginning no later than December 31, 2019. The 643 Monitoring Plan shall include a description of data collection and analysis procedures, equipment maintenance and calibration procedures, and schedules for reporting results to MDE.

iii. If the monitoring conducted under the 643 Monitoring Plan identifies violations of the daily average or instantaneous standard, the Licensee shall, within 30 days, notify MDE of the exceedence in writing and submit a plan to MDE for approval proposing corrective actions to prevent similar exceedences in the future. The Licensee shall implement such corrective action plan after it is approved by MDE.

iv. No later than June 30, 2019, the Licensee shall submit to MDE for approval a plan for monitoring and reporting any fish kills exceeding 50 fish in the Reservoir and/or the Tailrace (the "Fish Kill Monitoring Plan"). The Fish Kill Monitoring Plan shall include data collection procedures, analysis methods, and reporting commitments.

F. Trash and Debris in Reservoir and Movement Downstream

i. The Licensee shall employ clamming (or any other equally or more effective measures of its choosing approved by MDE), to remove floating and water surface trash and debris that accumulates in the Reservoir behind the Dam at least weekly (unless storm conditions preclude removal in a particular week). During clamming/trash and debris removal events, the Licensee shall remove all visible trash and debris. Removal shall occur at least forty (40) times per year between January 1 and November 1, starting in January 2019. The Licensee shall monitor and record the duration of the clamming/trash and debris removal events (number of hours), and the amount of debris and trash removed and subsequently disposed of during each clamming/trash and debris removal event (in cubic yards). The Licensee shall submit these data to MDE each year by November 30 and, after 3 years of this effort, and, based on these data, the Licensee may request from MDE a reduction in the required frequency of clamming/trash and debris removal events, and MDE may reduce the required frequency of clamming/trash and debris removal events based on a review of the data.

ii. The Licensee shall, no later than December 31, 2019, employ on a daily basis the use of a self-propelled skimmer barge (unless storm conditions preclude its use during a particular timeframe). If the Licensee seeks to reduce the requirement to use this skimmer barge on a daily basis, the Licensee shall provide MDE with data collected over a 3 year period documenting the days and hours of operation and the amount of material collected and disposed of (in cubic yards) for each week of operation. Based on the data collected, the Licensee may request a from MDE a modification to this requirement for daily operation of the skimmer barge, and MDE may modify the requirement to use a self-propelled skimmer barge daily based on a review of the data.

iii. The Licensee shall respond to any complaint from a marina operator or public boat ramp "monitor" (e.g., DNR) about accumulated trash and debris interfering with recreational uses in the Reservoir by removing any accumulated trash and debris that is interfering with recreational uses within 48 hours of a complaint during the recreational season (between Memorial Day and Labor Day) and properly disposing of removed materials. The Licensee shall maintain for MDE review, records of complaints filed (name, date, time, location,

nature of the trash and/or debris issue and amount), and corrective actions taken (date, time, description of action, and, amount of trash and/or debris removed).

iv. The Licensee shall sponsor at least two annual community-based cleanups of the Reservoir, tributaries upstream of the Project that feed the Reservoir, and the River and tributaries downstream of the Project. The Licensee shall advertise each event, provide all needed supplies, and arrange and pay for the disposal of collected materials.

v. After any storm event which has resulted in trash and debris moving downstream and blocking downstream water supply intakes in the River, the Licensee shall ensure that trash and debris that is blocking downstream water supply intakes is removed as soon as it is safe to enter the water after the storm event.

vi. No later than December 31, 2019, the Licensee shall perform and submit to MDE a study regarding the feasibility of using one or more water wheel trash interceptors powered by solar panels or other renewable sources (a "Trash Wheel"), to remove floating and water surface trash and debris in the Reservoir. If Licensee determines that using one or more Trash Wheels to aid compliance with WQS would be reasonably practical, the Licensee shall submit to MDE for approval a plan for the installation thereof at the Project.

G. Chlorophyll-A Levels in the Reservoir

i. No later than June 30, 2019, the Licensee shall submit to MDE for approval a plan for monitoring chlorophyll-A levels in the Maryland portion of the Reservoir (the "Chlorophyll-A Monitoring Plan"). The Chlorophyll-A Monitoring Plan shall provide for collection of three (3) years of data on chlorophyll-A levels in the Maryland portion of the Reservoir between May 1 and September 30, in accordance with a monitoring protocol to be provided by MDE no later than March 31, 2019, and shall be designed to determine with a high level of statistical confidence whether chlorophyll-A WQS are exceeded in the Maryland portion of the Reservoir between May 1 and September 30 in any particular year.

ii. Pursuant to the Chlorophyll-A Monitoring Plan, the Licensee shall provide MDE with (a) annual reports of all measured chlorophyll-A levels and dates and locations of monitoring in the Maryland portion of the Reservoir by December 31 of the year in which the monitoring occurred; and (b) a final report that analyzes and presents the results of all chlorophyll-A monitoring completed by June 30 of the year after the final year of monitoring.

iii. If any of the reports required by Section 7.G.ii reflect that chlorophyll-A levels in the Maryland portion of the Reservoir exceed WQS, the Licensee shall, within six (6) months after the date on which such report was submitted to MDE, submit to MDE for approval a plan to reduce chlorophyll-A levels in the Maryland portion of the Reservoir between May 1 and September 30 to meet WQS for chlorophyll-A within five (5) years (the "Chlorophyll-A Reduction Plan").

iv. If MDE determines at any time that chlorophyll-A levels in the Maryland portion of the Reservoir exceed WQS, and the City of Baltimore withdrew water from the Reservoir and incurred necessary additional treatment costs associated with elevated chlorophyll-

A levels in that year, the Licensee shall promptly reimburse the City of Baltimore for such additional costs.

H. PCB Levels in Fish Tissue

i. The Licensee shall ensure that Project operations and discharges do not cause or contribute to PCB levels in fish tissue in violation of WQS including designated and achieved uses.

ii. MDE is reviewing available information on the potential sources of PCBs in the Reservoir and downstream of the Project to determine the need for additional data collection and/or corrective actions to address elevated PCB levels in fish tissue in the Reservoir and downstream. MDE may, in the future, require the Licensee to undertake data collection (e.g., sampling of sediment for PCBs) and/or actions to reduce PCB levels in the Reservoir and/or in the Project's discharges to the River.

iii. Should MDE determine that the Licensee needs to undertake data collection and/or reduce PCB levels in the Project's discharges to the River and/or in the Reservoir, MDE may re-open this Certification pursuant to Section 7.Q.xvii to require the Licensee to develop a plan for MDE review and approval for data collection and/or corrective actions to reduce PCB levels in the Reservoir and/or in the Project's discharges to the River. The Licensee shall prepare and submit for MDE approval any such plan requested by MDE within twelve (12) months of MDE's request.

I. Shoreline Management Plan (SMP)

i. The Licensee shall comply with the SMP, subject to the other provisions of this Section 7.I.

ii. Non-Project use of Project Land. If the Licensee intends to make any non-Project use of any Project land, or receives any request from a third party for non-Project use of any Project land, the Licensee shall (a) prepare, or require the third-party requestor to prepare, a written an assessment of the impacts on water quality of the proposed use; (b) provide this assessment to MDE for MDE's review and decision regarding whether the proposed use is consistent with WQS including designated and achieved uses; and (c) not engage in or allow such use until MDE notifies the Licensee in writing that MDE has no objections to such proposed use.

iii. Shoreline Vegetation Management. If the Licensee intends to make any modifications to the shoreline vegetation for viewshed maintenance and development and recreation access within the Project boundary, the Licensee shall (a) prepare a written assessment of the impacts on water quality of the proposed modifications; (b) provide this assessment to MDE for MDE's review and decision regarding whether the proposed modifications are consistent with WQS including designated and achieved uses; and (c) not undertake any such modifications until MDE notifies the Licensee in writing that it has no objections to such proposed use.

iv. Sensitive Natural Resources Protection Overlay and Policies. The Licensee shall consult with MDE regarding any proposed modification of an existing use of Project lands in cases where such use may affect any sensitive aquatic resource identified by the Licensee in the "sensitive resources overlays" included in the SMP.

v. SMP Updates. No later than January 1 of 2028, 2038, 2048, and 2058, the Licensee shall submit to MDE for approval proposed improvements to the SMP (each, an "SMP Update"). Each SMP Update shall include an assessment of the impacts of deleted, revised, or new measures on water quality.

J. Turtle Management Plans

i. Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit to MDE for approval, a plan for the protection and enhancement of the bog turtle population associated with Project lands (the "Bog Turtle Plan"). The Bog Turtle Plan shall include (a) the restriction of mowing in the wetlands within the Project boundaries that are documented to support bog turtles; (b) invasive plant and woody plant control, particularly red maples and reed canary grass, in the areas around the wetlands within the Project boundaries that are documented to support bog turtles; (c) limits on public access to the wetlands within the Project boundaries that are documented to support bog turtles without advertising the reason; and (d) an assessment of the impacts, if any, of the specific measures planned to be implemented on WQS including designated and achieved uses.

ii. Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit to MDE for approval, a plan for the protection and enhancement of the northern map turtle population associated with Project lands (the "Map Turtle Plan"). The Map Turtle Plan shall include (a) annual monitoring of the northern map turtle population at the Project for 10 years, followed by population monitoring every 5 years during the Term; (b) a study to determine the amount of artificial basking habitat needed over the normal range of generation flows to support current and future populations of northern map turtles within the Reservoir and all areas of the downstream River affected by generation flows; (c) a study to determine the proper locations for deployment of artificial basking platforms; (d) nest management and protection measures; (e) annual monitoring of the use and success of both the mitigation and protection measures; (f) an assessment of the northern map turtle's response to changes in operating practices at the Project that are required by this Certification or the New License; and (g) methods of altering or amending protection and mitigation measures as a result of the monitoring, in consultation with MDE.

K. Waterfowl Nesting Protection Plan

Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit for MDE approval a waterfowl nesting protection plan (the "Waterfowl Plan"). The Waterfowl Plan shall: (i) identify specific Project-related effects on nesting waterfowl, such as flooding during the nesting season; (ii) identify which species of nesting waterfowl (including the black-crowned night heron) are affected by the Project, if any; (c) if Project-related effects are identified, describe appropriate protection or mitigation

measures; and (d) provide an assessment of the impacts of such protection and mitigation measures on water quality.

L. Monitoring Stream Flows in the Tailrace

Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2019, submit to MDE for approval a plan for the re-design, installation, and maintenance of best available real-time flow telemetry at the stream gage in the Tailrace (USGS Station Gage #01578310) (the "Tailrace Gage Plan"). The Tailrace Gage Plan shall provide for Licensee to submit monitoring results from the Tailrace Gage to MDE no less than annually, by December 31 of each year, which results shall be included in the Minimum Stream Flow Operation Plan (MSFOP) annual report.

M. Sturgeon Protection

Notwithstanding anything to the contrary in the SMP, the Licensee shall, no later than September 1, 2020 (or sooner, if required by a federal governmental agency), submit to MDE for approval a plan for the protection and enhancement of the Sturgeon populations associated with the Project (the "Sturgeon Plan"). The Sturgeon Plan shall include: (i) provisions to monitor and report stranded Sturgeon within Project boundaries and in the River downstream from the Project; (ii) provisions to eliminate stranding of Sturgeon as a result of Project operations; (iii) procedures for trapping, handling, and safely returning Sturgeon lifted at any fish lift to the Tailrace; (iv) monitoring of water quality in any tanks used to hold Sturgeon; and (v) procedures for monitoring tagged Sturgeon and other tagged fish below the Dam and in the Bay including Environmental DNA.

N. Habitat Improvement Projects

i. No later than September 1, 2019, the Licensee shall submit to MDE for approval a plan for implementing Habitat Improvement Projects ("HIPs") in the River extending approximately 4.5 miles downstream of the Dam to the island complex that includes Robert and Spencer Islands (the "HIP Plan"). The HIPs shall target habitat improvements for Shad, Herring, freshwater mussels, native EAV and SAV, shortnose sturgeon, smallmouth bass, and macroinvertebrates at the following locations: (a) the mouth of Octoraro Creek; (b) the north end of Sterret Island; (c) McGibney Island; (d) the Robert, Wood, and Spencer Island complex; (e) the mouth of Deer Creek; (f) Snake Island; (g) downstream of Bird Island; (h) Rowland Island; and (i) the Fish Pot area along the western shore, located southwest of Bird Island. The objectives of the HIPs shall include creating, enhancing, or protecting (1) habitat for Shad and Sturgeon at the spawning and fry life stages; (2) natural vegetation (while minimizing the potentially negative impacts of working near invasive vegetative species); and (3) habitat for other aquatic species.

ii. The Licensee shall develop conceptual HIP designs based on a review of the latest Habitat Suitability Index maps, water surface elevations, depths, velocities, and substrate mapping. Hydraulic analysis shall be used to assist in determining the final location, length, height, and structural design of HIP structures to meet HIP objectives. The HIP Plan shall include for each HIP a description of the proposed HIP, the current habitat suitability, the

limiting factors for specific flow regimes, a preliminary assessment of feasibility, and any potential constraints.

O. Lower River Fisheries Survey

i. No later than September 1, 2019, the Licensee shall submit to MDE for approval a plan for monitoring and protection of fish in the Lower River, specifically targeting the federally-endangered Maryland Darter ("Darter") and the State-threatened Chesapeake Logperch ("Logperch") population(s) (the "Fish Protection Plan"). The Fish Protection Plan shall (a) include monitoring by Licensee of the River tributaries' fish populations and the lower riffle habitats of Deer Creek, Octoraro Creek, Broad Creek, and Conowingo Creek during spring, summer, and fall every five years; (b) provide for monitoring by electrofishing (conventional and trawl), snorkeling, and/or seine surveys, or otherwise as approved by DNR; and (c) require each sampling event in riverine habitat to include sampling technique(s) targeting Darter and Logperch.

ii. No later than September 1 of each year during the Term after 2019, the Licensee shall submit to MDE a comprehensive fisheries report including (a) analysis of fish population trends and correlations with abiotic data, if available, based on data obtained through implementation of the Fish Protection Plan; and (b) the Licensee's recommendations for continued protection and enhancement of the fish populations below the Dam and statistical methodologies used to estimate sample size and/or extinction probabilities.

iii. No later than September 1 of 2024, 2029, 2034, 2039, 2044, 2049, and 2054, the Licensee shall submit to MDE for approval proposed improvements to the Fish Protection Plan (each, an "FPP Update").

P. Spillway Modifications/Fish Stranding Minimization

No later than September 1, 2019, the Licensee shall submit to MDE for approval a plan for modifying the spillway Tailrace and/or modifying operational flow practices at the Project to reduce the numbers of rare, threatened, or endangered fish species stranded by Project operations (the "Stranding Minimization Plan"). If the Stranding Minimization Plan includes physical alterations in the spillway tailrace area, the Licensee shall include proposed methods to excavate new exit channels and/or the fill the designated isolated pools. If the Stranding Minimization Plan includes newly constructed exit channels, such new exit channels shall direct fish and other aquatic species towards the River's thalweg and shall be designed to prevent fish from avoiding the proposed channel exit to the Tailrace.

Q. General Requirements and Conditions

i. Other Authorizations. This Certification does not relieve the Licensee of the responsibility to obtain any other Authorizations related to the Project.

ii. Compliance with WQS / No Unauthorized Discharge or Other Work: The Licensee shall meet all applicable WQS including designated and achieved uses associated with the operations of and discharge from the Project. Except as specifically set forth herein (if at

all), this Certification does not authorize the discharge of any pollutants. The Licensee shall not discharge any waste or wastewater from the Project, unless specifically authorized by MDE. This Certification does not authorize any work to occur in waters of the State, including any dredging or the construction or placing of any physical structures, facilities, fill, or debris or the undertaking of related activities in any waters of the State.

iii. Civil and Criminal Liability: In issuing this Certification, MDE does not waive or surrender any right to proceed in administrative, civil, or criminal action for any violations of any Law occurring before issuance of this Certification. Nothing in this Certification shall be constructed to preclude the institution of any legal action for any reason or relieve the Licensee from any civil or criminal responsibilities, liabilities, or penalties for violation of any Law, including the Environmental Article and the Clean Water Act.

iv. Penalties for Noncompliance with Law and Violations of Certification: The Licensee shall comply at all times with the provisions, requirements, and conditions of this Certification, the Environment Article, the Clean Water Act, and all other applicable Laws and Authorizations. MDE may seek criminal, civil, and administrative penalties to the full extent provided by law for any violations of the provisions, requirements, and conditions set forth in this Certification, or for noncompliance with the Environment Article, the Clean Water Act, or other applicable Laws and Authorizations.

v. Record Keeping: All records and information resulting from the monitoring, sampling, record keeping, inspection, and reporting activities required by this Certification shall be retained during the Term, plus 5 years. This period shall be extended automatically during the course of litigation, or when requested by MDE. For any measurements or sampling taken to satisfy the requirements of this Certification, the Licensee shall record (a) the exact place, date, and time of sampling or measurement; (b) the person(s) who performed the sampling or measurement; (c) the dates and times the analyses were performed; (d) the person(s) who performed the analyses; (e) the analytical techniques or methods used; and (f) the results of all required analyses. The sampling and analytical methods used to shall conform to procedures for the analysis of pollutants as identified in 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants" unless otherwise specified by MDE in writing.

vi. Right of Entry: In addition to any other right of entry provided for by law, MDE, or its authorized representatives, shall have the right to enter at reasonable times the premises or property that is the subject of this Certification (including the Reservoir and all land within Project boundaries) or where any records are required to be kept under the provisions, requirements, and conditions of this Certification. This right of entry shall include the right to:

a. Access and copy, at reasonable times, any records that are required to be kept under the provisions, requirements, and conditions of this Certification;

b. Inspect, at reasonable times, any monitoring equipment or monitoring method required in this Certification;

c. Inspect, at reasonable times, any discharge facilities subject to this Certification;

d. Conduct sampling, at reasonable times, of any discharge or of the water column in the River or Reservoir;

e. Take soil or sediment borings or core samples, at reasonable times, in the bed of the River or the Reservoir; and

f. Take photographs.

vii. Duty to Provide Information: The Licensee shall submit to MDE, within the time frame stipulated by MDE, any information that MDE may require to determine compliance with this Certification. The Licensee shall also submit to MDE, upon request, copies of any records required to be kept by this Certification. When the Licensee is required to submit to any other federal or State resource agencies any reports that relate to the Project, the Licensee shall also submit a copy to MDE. Subject to the Maryland Public Information Act, all information submitted to MDE or collected as a condition of this Certification may be made publicly available.

viii. Property Rights: The issuance of this Certification does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of federal, State, or local Laws.

ix. Notice / Reporting of Noncompliance: Unless MDE provides different instructions in writing from time to time, any notice or other submission due to MDE under this Certification shall be provided in writing to:

Maryland Department of the Environment
Water and Science Administration
1800 Washington Boulevard
Baltimore, Maryland 21230

For any violations of the provisions, requirements, or conditions of this Certification, the Licensee shall promptly notify MDE by telephone within twenty four (24) hours of discovery of the violation, at 410-537-3510. In addition, within five (5) days, Licensee shall provide MDE with the following information in writing:

a. A description of the violation, including the date, time, location, and estimated discharge volume (if applicable), and impact on receiving water;

b. The cause of the violation, to the extent known;

c. The anticipated time the cause of the violation is expected to continue, or, if the condition has been corrected, the duration of the period of the violation;

d. Steps taken by the Licensee to eliminate or correct the violation;

e. Steps planned or implemented by the Licensee to prevent the recurrence of the violation; and

f. A description of the Licensee's accelerated or additional monitoring to determine the nature of any impact or harm caused by the violation.

Any notice or other submission due under this Certification to any governmental agency other than MDE shall be provided in writing to such agency in accordance such agency's written instructions from time to time.

x. Web Portal: The Licensee shall maintain at all times during the Term a web site or page specifically designed to provide the public with access to the information contemplated by Section 2.C.vii (the "Web Portal").

xi. Annual Reporting: The Licensee shall submit annual reports to MDE by September 1 of each calendar year following the issuance of this Certification and shall contemporaneously post such reports on the Web Portal. The annual reports shall summarize all work performed by the Licensee to comply with the provisions, requirements, and conditions of this Certification, and shall be in a format approved by MDE.

xii. No Waivers: MDE's failure to enforce any provision, requirement, or condition of this Certification shall not constitute a waiver of MDE's right to enforce any such provision, requirement, or condition, or otherwise relieve the Licensee from compliance with any obligations imposed by this Certification.

xiii. Additional Monitoring: The Licensee shall undertake additional monitoring, studies, or other measures relating to compliance with WQS including designated and achieved uses if MDE determines that there is a likelihood that any violations of WQS including designated and achieved uses have occurred or may occur.

xiv. Transfer: The Licensee shall notify MDE in writing upon transferring property ownership or responsibility for compliance with these conditions to another person. The new owner/operator shall request in writing transfer of this Certification to its name.

xv. Severability: The provisions of this Certification are severable. If any provision of this Certification is held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this Certification is held invalid, its application to other circumstances must not be affected. In the event any provision of this Certification is held invalid, and the Department determines that any applicable effluent limitation, other limitations, or water quality standards or requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State Law will not be met (including the failure to sustain a designated or achieved use) or that State or federal Law will be violated, or that further conditions are necessary to assure compliance, the Department may reevaluate and modify this Certification in accordance with Section 7.Q.xvii to include additional conditions necessary to assurance compliance with all such limitations, standards, or requirements.

xvi. No Third Party Beneficiaries: No provisions of this Certification are intended, nor will be interpreted, to provide or create any third party beneficiary rights. No third party shall have any legally enforceable rights, claims, or benefits under this Certification as to the Department, nor shall forbearance to enforce any term of this Certification by the Department be construed as creating any rights, claims, or benefits for any third party. No third party shall have any rights to enforce the terms of this Certification against the Licensee except as may be expressly be provided by federal law, including the citizen suit provisions of the Clean Water Act. This Certification does not affect and is not intended to influence any third party's rights to independently investigate, evaluate, respond to, and file claims regarding any impacts from groundwater or surface water pollution.

xvii. Adaptive Management: This Certification may be re-opened to be modified in order to comply with any applicable effluent limitation, other limitations, or water quality standards or requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State law if the limitation, standard, or requirement so issued or approved contains different conditions or is otherwise more stringent that any requirements of this Certification. If MDE determines that any applicable effluent limitation, other limitations, or water quality standards or requirements issued or approved under Sections 301, 302, 303, 306, and 307 of the Clean Water Act or applicable State law are not being met (including the failure to sustain a designated or achieved use) or that State or federal law are being violated, or that further conditions are necessary to assure compliance, MDE may reevaluate and modify this Certification to include requirements or conditions necessary to assure compliance with all such limitations, standards, or requirements. This includes:

a. Additional requirements or conditions are necessary to address adverse or potentially adverse Project effects on water quality or designated or achieved uses that did not exist or were not reasonably apparent when this Certification was issued;

b. There is a change in the Project or its operations that was not contemplated by this Certification that might adversely affect water quality or designated or achieved uses;

c. The re-licensing of Holtwood and/or Safe Harbor, as well as any changes associated with Muddy Run's FERC license or the Section 401 water quality certification for Muddy Run, requires alignment of flow, fish passage, sediment, nitrogen, and phosphorus-related conditions in this Certification;

d. Future TMDLs or modifications to existing TMDLs (not otherwise addressed in this Certification) identify impairments that justify additional conditions in order to ensure that WQS including designated and achieved uses are met over the Term;

e. Revised conditions related to trap and transport credits for fish passage are necessary based on review in subsequent years of the federal license of whether numeric targets for the number of Shad upstream of the York Haven Dam are being met;

f. MDE obtains any information providing a sound, science-based rationale for modifying any Plans or any requirements or conditions in this Certification, including information pertaining to climate change; or

g. Any typographical error is found in this Certification.

Any modified conditions of this Certification shall, so long as it is in effect, become a condition of any federal Authorization that is hereafter issued for the Project, and MDE may seek, in accordance with applicable Law, to have any modified Certification condition incorporated into any existing federal Authorization for the Project.

xviii. Reimbursement of Oversight Costs: The Licensee shall reimburse MDE and DNR for the reasonable and actual costs incurred by MDE, DNR and their contractors in connection with the direct administration and oversight of Licensee's compliance with this Certification, including any costs for conducting environment health monitoring or testing, collecting and analyzing soil samples, surface water samples, or groundwater samples, or reviewing any data, plans or information submitted by the Licensee. The maximum amount of costs for which Licensee shall be required to reimburse MDE pursuant to this Section 7.Q.xviii shall be Two Hundred Fifty Thousand ($250,000) per year, and the maximum amount of costs for which Licensee shall be required to reimburse DNR pursuant to this Section 7.Q.xviii shall be Two Hundred Fifty Thousand ($250,000) per year *provided*, that each of the foregoing amounts shall be adjusted for inflation after the date of this Certification on July 1, 2019 and on July 1 of each year thereafter, based on the cumulative change in the CPI.

xix. Final Decision; Appeal Rights: This is a final decision on the Application. Any person aggrieved by the Department's decision to issue this Certification may appeal such decision in accordance with COMAR 26.08.02.10F(4). A request for appeal shall be filed with the Department within 30 days of publication of the final decision, and specify in writing (a) the reason why the final decision should be reconsidered; and (b) a detailed description of the requestor's specific legal right, duty, privilege, or interest which may be adversely affected by the Department's final decision. A request for appeal shall be submitted to: Secretary of the Environment, Maryland Department of the Environment, 1800 Washington Boulevard, Baltimore, MD 21230. After issuance of notice of the Department's decision on the request for reconsideration, a contested case hearing shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq., Annotated Code of Maryland. Any request for an appeal does not stay the effectiveness of this Certification.

DATED this 27th day of April, 2018.

D. Lee Currey
Director
Water and Science Administration
Maryland Department of the Environment
State of Maryland

ATTACHMENT #1
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

MDE Fish Passage Improvement Plan ("MDE-FPIP")

This MDE-FPIP is based on the requirements of DOI's Modified Prescription for Fishways Pursuant to Section 18 of the Federal Power Act for the Project, dated June 8, 2016 (the "Prescription"), which shall be authoritative guidance for purposes of interpreting this MDE-FPIP and defining the Licensee's obligations hereunder. Notwithstanding the foregoing, in the event of any conflict between this MDE-FPIP and the Prescription, this MDE-FPIP shall govern and control.

Without limiting the generality of Section 2.C.ii of the Certification, in all cases where this MDE-FPIP requires the Licensee to consult with or make any submission to MDE, the Licensee shall also consult with, or make such submission to DNR, unless otherwise specified.

1. Initial Fishlift Capacity

The Licensee shall provide a fish lift capacity of at least 7 million pounds of fish per season immediately after issuance of the New License. Two 6,500-gallon hoppers sharing the same holding pool, with a cycle time of 15 minutes, provides capacity to move 7 million pounds of fish in a single season. Based on projected numbers of a successful Shad restoration using the population model, a fish lift capacity of 7 million pounds of fish should provide safe passage at the Project for approximately half of the Term (assuming that the gizzard shad population does not grow larger than 4.4 million fish). For details on calculating fish lift capacity, refer to Appendix A to this MDE-FPIP.

2. Final Potential Fishlift Capacity

The Licensee shall construct sufficient fishlift capacity during the Term to ensure that as populations of Shad and Herring grow in the system, that fishlift capacity is increased as necessary to ensure that upstream passage is not impeded by undersized fishlift capacity preventing the attainment of the restoration objectives. MDE recognizes the potential lack of capacity during the later years of Shad and Herring restoration, and will re-open this Certification to address this issue at a later date if fishway capacity appears to be a limiting factor to population restoration, as reflected in declining upstream fish passage efficiency due to lack of fishway capacity.

3. Design Flows for Fishways/Fishlifts

The Licensee shall design new fishlifts to ensure operation under River flows in the range of 6,330 cfs to 143,000 cfs. However, the Licensee shall not be required to operate the fishlifts at flows greater than 113,000 cfs unless data available at the time demonstrates that operation of fishlifts at flows greater than 113,000 cfs is necessary to achieve the target efficiency.

Furthermore, the fishlifts shall be designed with sufficient freeboard (or other protection) to minimize damage from River flows of up to the 50-year return interval.

4. Efficiency Criteria

The Licensee shall meet the SRAFRC (2010, 2013) and the USFWS (2015b) upstream and downstream passage efficiency criteria for the River basin that are the basis for the Department of the Interior (DOI) 2016 Modified Fishway Prescription (and the requirements of this Certification). MDE defines upstream fish passage efficiency as the proportion of the fish in the Tailwaters that successfully move through the fishlift and continue upstream migrations, calculated as a percentage. Downstream fish passage efficiency is the proportion of the fish that approach the upstream side of the Project and survive unharmed as they pass the Project and continue downstream migrations. Definitions for certain fish passage terms used in this MDE-FPIP are provided in Section 18 of this MDE-FPIP. Where no numeric efficiency criteria are set, MDE's goal is to minimize Project impacts to migratory fish populations, with a goal of 100 percent passage and the understanding that no project is likely to fully achieve that goal despite application of the best available technology. Where MDE, based on DNR analysis, has information or modeling indicating that restoration may be achieved with less than 100 percent passage, MDE has adopted numeric targets that will achieve restoration, and measures to reach those targets.

4.1 Criteria for Upstream Shad Passage Efficiency

The Licensee shall operate the Project to achieve the upstream passage efficiency criterion of passing 85 percent of all adult Shad that enter the Tailwaters ("Target Efficiency"). The Licensee can receive additional credit toward achieving the upstream passage efficiency criterion for adult Shad by trapping at the Project and transporting Shad to upstream of York Haven Dam and thus avoiding upstream passage impediments at the intervening hydroelectric projects on the River (see Section 13 of this MDE-FPIP).

4.2 Criteria for Downstream Shad Passage Efficiency

The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 80 percent of the adult Shad moving downstream past the Dam. The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 95 percent of the juvenile Shad moving downstream past the Dam.

4.3 Criteria for Upstream Herring Passage Efficiency

The Licensee shall operate the Project to provide safe, timely and effective upstream migration for adult Herring that approach the Tailwaters. MDE reserves the right to develop numerical criteria for upstream Herring passage efficiency in the future when additional information about Herring populations becomes available and re-open this Certification in the future to establish required numeric targets for upstream passage efficiency for Herring. Any needed change in fishlift requirements resulting from such new targets is not provided for in this Section 4 and would also be considered a basis for re-opening the Certification.

4.4 Criteria for Downstream Herring Passage Efficiency

The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 80 percent of the adult Herring moving downstream past the Dam. The Licensee shall operate the Project to achieve the downstream survival efficiency criterion of at least 95 percent of the juvenile Herring moving downstream past the Dam.

5. Seasonal Implementation of Fish Passage

5.1 The Licensee shall operate a fishlift for upstream passage of anadromous fish daily during the Shad and Herring upstream Migration Period, as set forth in Appendix D to this MDE-FPIP. The Licensee shall operate the fish lift(s) daily during the upstream Migration Period, and begin releasing attraction flows at least one hour prior to the start of daily lift operations. The fish lift(s) will operate at the following times during the Migration Period: (1) in March, from 7 a.m. to 7 p.m.; (2) in April, from 6:30 a.m. to 7.30 p.m.; and (3) in May and June from 6:00 a.m. to 8:00 p.m.

5.2 The Licensee shall ensure prior to the start of the Migration Periods that all mechanical elements of the fishlifts are working properly. The Licensee shall repair, maintain, and test fishlifts as necessary in advance of the migration period, in accordance with the Fishlift Operation and Maintenance Plan ("FOMP") so as to begin operations when required.

5.3 The Licensee shall maintain and operate fishlifts to maximize fish passage effectiveness throughout the upstream and downstream migration periods, as set forth in Appendix D to this MDE-FPIP.

6. Fishlift Operation and Maintenance Plan

6.1 The Licensee shall develop and submit a FOMP to MDE approval. The Licensee shall keep the FOMP updated on an annual basis, to reflect any changes in fishlift operation and maintenance planned for the year. If MDE requests a modification of the FOMP, the Licensee shall respond to the requested modification within 30 days of the request by filing a written response with MDE.[1] Any modifications to the FOMP by the Licensee shall require approval by MDE. The FOMP shall include:

(a) Schedules for routine maintenance, pre-season testing, and the procedures for routine fishlift operations, including seasonal and daily periods of operation, and associated Dam and powerhouse operational measures needed for proper fishlift operation;
(b) Details of how the Project shall be operated during the migration season to provide for adequate fish passage conditions, including:
    (i) Pre-season preparation and testing;
    (ii) sequence of turbine start-up and operation under various flow

[1] Requested modifications to the FOMP will not include changes to turbine operations. Any modifications to turbine operations shall be implemented only pursuant to Section 8.

regimes to enhance fishlift operation and effectiveness;

(iii) debris management at the fishway entrance, guidance channels, and the exit; and

(iv) plant operations to provide near- and far-field attraction flows required for the fishlift zone of passage in the tailrace;

(c) Trap and transport logistics plan and design plans for west and east fish lift modifications needed for trap and transport, including provisions for planning trap and transport logistics so as to avoid, to the extent possible, trapping a population unrepresentative of the migrating population as a whole.

(d) Procedures for removing invasives (see Attachment #3 for invasive species requirements) and sturgeon handling;

(e) Standard operating procedures for monitoring and enumerating fish passage by species;

(f) Standard operating procedures for collecting biological samples from target species to assess restoration efforts;

(g) Standard operating procedures for monitoring and reporting operations that affect fish passage;

(h) Standard operating procedures in case of emergencies and Project outages to first, avoid, and second, minimize, potential negative impacts on fishway operations and the effectiveness of upstream and downstream passage for target species; and

(i) Plans for post-season maintenance, protection, and winterizing the fish lifts and Eel passage facilities.

6.2 The Licensee shall provide written documentation to MDE that all fishlift operational personnel have reviewed and understand the FOMP and it shall be signed by the operations manager of the Project. Copies of the approved FOMP and any modifications shall be provided to MDE on an annual basis.

6.3 By December 31 of each year, the Licensee shall provide an annual report to MDE detailing: the implementation of the FOMP, including any deviations from the FOMP and a process to prevent those deviations in the future; any proposed modifications to the FOMP, or in the case of emergencies or Project outages, the steps taken by the Licensee to minimize adverse effects on fisheries including any proposed modifications to those steps to further enhance their effectiveness in the future; and operational data for both fishlifts and the Project to allow MDE and others identified by MDE to examine correlations between particular operational patterns and successful or unsuccessful fishlift operation; and to confirm, once an operational regime with known effectiveness is settled upon, that the Project continues to operate under that regime. MDE understands that details of operation constitute confidential business information, and agrees to protect them from disclosure as such to the extent it is able to do so by law. The annual report shall also include:

(a) Description of routine maintenance as well as repairs made to the fishways or Eel passage facilities during the previous fish passage season;

(b) Average daily flows at the Marietta Gage;

(c) Daily water temperature and DO readings in the fish lift and Tailwater areas;
(d) Hourly individual turbine unit operations and discharge, hourly total discharge from the powerhouse, hourly discharge over the spillway, and hourly passage counts of all fish species at each lifted hopper;
(e) Index for every lift of each hopper's "fullnesss" through visual observations and shall be developed in consultation with MDE; provided, that if technology becomes available to quantify the bucket "fullness", then after a written request from MDE, the Licensee shall incorporate this technology;
(f) Thirty-minute recordings of total flow discharging from behind the hopper, total flow discharging from the attraction water supply diffuser, water surface elevation immediately upstream from the entrance gates, water surface elevation at the Tailwaters, elevation to the crest of the entrance weir gates, and any irregularities such as the identification of a visible boil in the zone over the floor diffusers;
(g) Number of fish by species trapped and transported, including date, time, and location of release; and
(h) Daily collection of biological information from adult Shad, gizzard shad, Herring, or other species as designated by MDE to include sex ratio, condition, length, weight, and age.

6.4 In addition to the annual report, the data for daily flows, water quality, Project operations, fishlift operations and fish passage as described above shall be recorded in a database during the fish passage season and MDE and its designees shall be provided open access to that database. Data shall be entered into the database no later than one week after collection. These data shall be used to assess the impacts of River conditions and hydropower operations on successful fish passage through the lifts, with the goal of achieving a better diagnosis of potential fish passage issues at the Project.

6.5 By January 31 of each year, the Licensee shall consult with MDE to discuss the FOMP. This meeting shall occur no later than January 31 of each year unless the Licensee and MDE agree on a different date. At this annual meeting the participants shall discuss the fish passage results from the previous year, review regulatory requirements for fish lift operations, and discuss any modification or testing the Licensee shall conduct during the upcoming season.

7. Sequencing of Upstream Fish Passage Construction and Implementation

Timely construction, operation, and maintenance of fishlifts is necessary to ensure their effectiveness and to achieve restoration goals. Therefore, the Licensee shall: (1) notify, and (2) obtain approval from MDE for any extension of time to comply with conditions MDE has required.

7.1 Trap and Transport of Shad and Herring

The Licensee shall trap and transport Shad and Herring to areas upstream of York Haven Dam annually. The number of Shad and Herring trapped and transported annually will be

up to 80 percent of the number of each species captured in the fish lifts up to a maximum of 100,000 of each species annually. Trap and transport operations shall continue until the Licensee achieves a measured 85 percent upstream passage efficiency for Shad at the Project without reliance on the trap and truck credit as provided for in Section 13 of this MDE-FPIP.

7.2 Initial Construction

Unless otherwise stated, the Licensee shall implement the requirements of Section 10.1 of this MDE-FPIP by September 1, 2021. Construction shall be conducted in a way as to allow for trap and transport operations as well as volitional passage at the EFL to continue uninterrupted during this time period. A fish trap shall be constructed in the EFL no later than September 1, 2019. It shall be capable of trapping and holding target fish while continuing to pass fish. Safe and effective transfer of fish from the trap to the tailrace is required. The design must be approved by MDE prior to construction.

7.3 Operation in the First Passage Season after License Issuance

No later than September 1, 2019, trap and transport operations from the EFL and WFL shall begin. A total of 80 percent of the run, up to 100,000 Shad and 100,000 Herring per year shall be trapped and transported to the mainstem River upstream of York Haven.

8. Efficiency Testing and Triggering of Subsequent Modifications

8.1 No later than September 1, 2023, the Licensee shall begin the "Initial Efficiency Test" of fish passage at the Project. The Licensee shall conduct the Initial Efficiency Test as defined in Section12.2 of this MDE-FPIP in order to evaluate passage performance relative to upstream efficiency criteria for Shad and Herring as described in Section 4 of this MDE-FPIP. Gizzard shad or other designated species (to be designated by MDE with input from DNR) shall be included in all efficiency tests to understand how they affect efficiency for Shad and Herring. In the 5th year after the year in which the New License is issued, the Licensee shall also assess mortality of Shad during the trap and transport process.

8.2 If at the end of the Initial Efficiency Test, the combined results of the three-year study (the combination of measured efficiency of the Initial Efficiency Test and the "Trap and Transport Credit" (as described in Section 13 of this MDE-FPIP) resulting in an "Adjusted Efficiency") meet the Target Efficiency of 85 percent for upstream passage of Shad, the Licensee shall operate the Project using the FOMP implemented during the Initial Efficiency Test. The Licensee shall then conduct a two-year "Periodic Efficiency Test" as defined in Section 12.2 of this MDE-FPIP in every 5th year thereafter to ensure that the upstream-prescribed efficiency criterion continues to be met through the Term.[2]

8.3 If at the end of the Initial Efficiency Test or after any Periodic Efficiency Test thereafter during the Term, or after any subsequent "Post-Modification Efficiency Test" as defined

[2] At the Licensee's election, and with MDE concurrence, the Periodic Efficiency Test may be extended an additional one year. Only after the efficiency tests are completed will the Licensee be required to propose, as may be necessary, a course of action to achieve the Target Efficiency.

in Section 12.2 of this MDE-FPIP, the study results indicate that the Licensee is not meeting the required Adjusted Efficiency, the Licensee shall conduct an evaluation of the radio telemetry data and any other data available to MDE and/or the Licensee to determine why passage efficiency is inadequate. Concurrent with the submission of the final report from an efficiency study, the Licensee shall propose a course of action most likely to achieve the Target Efficiency. MDE has designated a tiered list of options and the types of passage or capacity problems which the tiers may address. If the reason for not achieving the Target Efficiency is insufficient fishlift attraction, then the Licensee shall follow the actions in Section 10.2 of this MDE-FPIP.

If the fish lift capacity is insufficient then the Licensee shall follow the actions in Section 11 of this MDE-FPIP. In the event that both fishlift attraction and fish lift capacity are limiting factors to achieving the Target Efficiency, the Licensee shall address items listed under both Sections 10.2 and 11 of this MDE-FPIP, but only to the extent both attraction and capacity measures are necessary to achieve the required Target Efficiency and alleviate over-capacity. The list of measures in Sections 10.2 and 11 of this MDE-FPIP is not exclusive and does not preclude MDE or the Licensee from identifying and proposing other measures commensurate with the required level of improvement and corresponding tier. MDE shall react to the Licensee's proposal for improving fish passage efficiency within 90 days of receipt. It may:

(a) Say nothing, in which case the Licensee shall proceed with its proposed course of action;
(b) Agree affirmatively with the Licensee's proposed course of action, in which case the Licensee shall proceed;
(c) Propose a different option, not on the tiered list of options, which the Licensee shall proceed with if it agrees;
(d) Require, instead, that the Licensee implement an option or options from the appropriate (or lower numbered) tier to address each problem. MDE will choose that option (s) it deems most likely to achieve the *Target Efficiency. MDE* may select an option from a higher-numbered tier only if all options from an appropriate or lower-numbered tier have been implemented. If two or more options appear equally likely to achieve the efficiency criterion, MDE will present the Licensee with the choice, and the Licensee may proceed with whichever it prefers. MDE shall explain, in writing, its reasons for finding that its choice(s) is more likely than the Licensee's to lead to the desired passage efficiency. The Licensee shall then proceed with the selected course of action.

9. General construction requirements.

All functional (i.e., 30 percent, 60 percent, and 90 percent) and final design plans, operation and maintenance plans, construction schedules, and hydraulic model studies for the new fishlifts or modifications to existing fishlifts described herein shall be submitted to MDE for approval. The planning and design process for structures shall generally include computational fluid dynamics (CFD) modeling prior to construction and post-construction shakedown and testing to confirm modeling.

MDE, DNR, and USFWS shall be consulted during the design and construction of the fishlifts and MDE must approve all plans in writing prior to construction initiation. Upon a decision to build or modify, the Licensee shall meet with MDE, DNR, and USFWS to develop detailed construction plans and schedules, which shall be submitted for MDE approval no later than March 1, 2019, and thereafter, by January 31 of each construction year for approval by MDE. The detailed construction schedules shall be designed to minimize interruption of the fishlift operations and, to the extent possible, fishlift operation interruptions shall be scheduled during the month of June.

10. Fish Passage Facilities

10.1 Initial Construction Items

(a) *East Fish Lift Modifications*. The Licensee shall modify the EFL facility to provide 900 cfs attraction flow to the EFL. If the attraction flow cannot be provided within the current EFL structure without exceeding USFWS design specifications, flow in addition to internal EFL flow will be provided to achieve a total of 900 cfs. Modifications to the EFL facility will include replacing spillway gates A & B, replacing the crowder system, addressing structural vibration issues, replacing diffuser gates A and B, replacing the control system, and upgrading the electrical system to allow for a 15 minute lift cycle.

(b) *Replace the current 3,300-gallon hopper with two 6,500-gallon hoppers at the EFL*. The Licensee shall remove the current hopper and install two 6,500-gallon hoppers within the existing superstructure of the EFL. One hopper will replace the current 3,300-gallon hopper and the second hopper will be located immediately upstream from the current location of the existing EFL hopper (see Figure 10 from the DOI Modified Fishway Prescription of June 2016 showing the conceptual drawing of proposed modifications to the EFL). Access to both hoppers will be provided by the current entrance gates (A, B, and C) and the hoppers will share the same holding pool.

(c) *Trap and Transport Facilities at the EFL*. The Licensee shall reduce cycle time at each hopper at the EFL to be able to lift fish four times per hour and complete modifications to the EFL structure to allow for trapping and sorting fish at the EFL facility and transporting them to the western side of the Dam to a truck for transport upstream. Modifications to the EFL shall include two new sorting tanks; a loading tank; and a by-rail truck and forklift, or functionally similar equipment, to facilitate movement of Shad from sorting tanks at the EFL to the west shore. These improvements shall be accomplished without losing a season of the passage provided by the EFL.

(d) *Trap and Transport Facilities at the WFL*. WFL modifications shall be made to facilitate trap and transport including: decreasing lift cycle time by replacing the crowder linkage system and raising the elevation of the sorting tank(s), and providing a mechanism to allow for direct sluicing of fish into tanks mounted on the transport vehicle. These initial improvements shall be accomplished without losing a season of the passage provided by the EFL or trap and transport from the WFL.

(e) *Provide a Zone of Passage (ZOP) to the Fish Passage Facilities*. The Licensee shall construct and maintain structures, to provide Shad and Herring a ZOP (i.e., route of passage) as described in this Section 10.1(e). In advance of any ZOP development and/or construction, MDE and the Licensee will review CFD modeling results from the tailrace. The Licensee shall run the model under a predetermined number of structures arrangements (e.g., different angles, different spacing between the weirs, different weir slopes). In consultation with MDE, the Licensee shall choose to construct the configuration of structures that provides the most conducive hydraulic conditions for fish passage of Herring. The area to be considered for potential ZOP improvements includes approximately 2,500 feet on the west bank and 3,500 feet on the east side of Rowland Island. Based on CFD modeling results that analyze discharge velocities and turbulence, the Licensee shall provide stone weirs, and/or other suitable alternatives or measures that provide a contiguous ZOP from the southern tip of Rowland Island to one or both of the lifts. The Licensee shall install up to ten stone weirs, with the option of considering other configurations for structures. Model results will guide the placement and formation of these structures to provide for the hydraulic conditions necessary for the weakest swimmers (Herring) to reach the lifts. Specifically, the ZOP must be designed to maintain instantaneous velocities below 3 feet per second, separated only by brief regions of higher velocity that Herring may traverse in seconds at burst speeds up to 6 feet per second, over the full range of operational flows for the EFL, and in all generation scenarios. After ZOP construction is completed, the Licensee shall assess the ZOP for upstream migrating Herring under the full range of the current fish passage design flows (i.e., up to 113,000 cfs of River flow). These structures shall also minimize or eliminate sheltering areas for predators. The ZOP shall be subject to approval by MDE.

10.2 Improving Attraction Efficiency

Presented below is a list of physical and operational modifications to the Project intended to address observed deficiencies in fishlift attraction efficiency. The tiered process for improving attraction efficiency is based on passage efficiency during the most recent efficiency test. The items included in the different tiers were developed to be commensurate with the degree of shortfall from the *Target Efficiency.* If, based on the *Adjusted Efficiency* of the current test, all appropriate options from the corresponding tier, including any option proposed by the Licensee and approved by MDE have been exhausted, the items from the next highest numbered tier may be required, regardless of the current Project passage efficiency. More than one item from a tier may be completed at one time depending on the degree of the *Adjusted Efficiency* shortfall.

(a) *Tier I (Adjusted Efficiency 70%-85%)*. In the year following any failure by the Licensee to reach the *Target Efficiency* due to inadequate fishway attraction, the Licensee shall implement one or more of the modifications to Project operations and facilities described in this Section 10.2(a).

(i) *Correct any Technical Operational Problems and/or Implement Internal Modifications*. The Licensee shall correct any technical operational problems that may have been detected during the fish passage season and/or implement internal modifications to the WFL and/or EFL (e.g., energy dissipation, hydraulic attraction).

(ii) *Implementation of preferential turbine operating schemes.* The Licensee shall develop a turbine operation scheme that can range from simply first on/last off to modification of specific Francis and Kaplan unit operation to ensure that fish are able to successfully locate and access the fish lift entrances.

(iii) *Increase attraction flow at the EFL.* The Licensee shall construct an alternative attraction water structure as part of the EFL which shall be constructed to allow more than 1,000 cfs during the fish and Eel migration season and be adaptable for fish and Eel attraction and maintain velocities at or below USFWS criteria. The alternative attraction water structure and velocities must use field verification for the target species.

(b) *Tier II (Adjusted Efficiency 55%-69%).* Within 2 years following any failure to meet the *Target Efficiency,* the Licensee may implement either one of the modifications to the Project facilities described in this Section 10.2(b) to reach upstream passage efficiency.[3]

(i) *Relocate EFL Entrances A & B.* If the CFD modeling results indicate modifications to Entrances A & B will improve guidance to and accessibility of the lift entrances, then the Licensee shall extend the entrance channel at entrance A with two 45-degree turns in the fish passage facility channel, so as to discharge into the area behind the catwalk piers and upstream from the Kaplan turbine discharge/boil. The attraction flow should be effective along the catwalk and through the space between the piers. The Licensee shall also modify the existing entrance B so that the centerline of the discharge plume will be at a 45-degree angle to the River flow.

(ii) *Construct new Entrances with a separate crowder and holding pool.* No later than December 31, 2033, the Licensee shall build new entrances with a separate crowder and holding pool (Figure 10). The hopper will be accessed from the new entrance and through a proposed collection gallery that will span the full length of the Kaplan turbine section of the powerhouse. The new entrances and the collection gallery are intended to provide access to the EFL from the Francis turbine section of the powerhouse. The new collection gallery will be located against and along the powerhouse wall.

(c) *Tier III (Adjusted Efficiency less than 55%).* Following any failure by the Licensee to reach upstream passage efficiency, the Licensee may implement one or more of the modifications to Project operations and facilities described in this Section 10.2(c).

(i) *Construct an Auxiliary Water Supply (AWS) at the EFL.* The Licensee shall construct a new AWS stilling basin and system so the energy from up to 4,300 cfs

[3] MDE may require relocation of Entrances A&B and, if the *Adjusted Efficiency* continues to be between 55%- 69%. Entrance D at a later point. But then, per Tier III (and consistent with the "not before" dates), may only require the AWS, not the WFL. Alternatively, MDE may require the relocation of Entrance A&B. and in subsequent cycles proceed to choose the WFL (again. consistent with the "not before" dates) if(a) the *Adjusted Efficiency* is below 55% and Entrance D has not been constructed or (b) the *Adjusted Efficiency* is between 55%- *69%* and MDE determines that Entrance D is not likely to achieve the efficiency criterion.

can be dissipated and incorporated into effective attraction flows emanating from the multiple fish lift entrances.

(ii) *WFL Construction.* No later than December 31, 2043, the Licensee shall construct a new WFL (as described below, in parts 1-5) in the west corner of the powerhouse tailrace. The Licensee shall operate the new WFL as a Tailwater to headpond fish lift with a collection facility for fish sampling that could be used as a fish trap and transport facility. If MDE requires construction of the WFL for reasons of passage efficiency, it agrees not to subsequently require the EFL AWS stilling basin and system before 10 years after the completion of the WFL.

(A) WFL Construction, Part 1. The Licensee shall construct a facility that provides the capability of enumerating fish passage by species, allows for two independent trapping and holding facilities for biological sampling while continuing to pass fish, and that can also be used for trapping and transporting Shad and Herring with the potential for captured fish to be transported upstream of the York Haven Dam.

(B) WFL Construction, Part 2. The Licensee shall install two 6,500-gallon hoppers, with separate crowders, in the new WFL, capable of operating simultaneously.

(C) WFL Construction, Part 3. The Licensee shall construct the WFL to have the ability to provide up to 5 percent of hydraulic capacity of the Project (or up to 4,300 cfs) for attraction flow to the fishway entrance(s). During the design phase and during preconstruction, the Licensee shall conduct CFD modeling and other supporting analysis to develop appropriate fish lift entrance attraction flows, velocities, and hydraulic conditions. The Licensee shall operate the WFL to provide attraction flow of at least 2,600 cfs (3 percent of hydraulic capacity of the Project) during the Upstream Migration Period for Shad and Herring. With the goal of improving fish passage efficiency at the WFL following initial start-up of the new WFL, MDE may require the lift operator to modify operation of the fish lift, the allocation of flows through its AWS, and/or the total amount of flow being supplied to the WFL (up to a maximum of 4,300 cfs or 5 percent of the Project hydraulic capacity).

(D) WFL Construction, Part 4. The Licensee shall design and construct an AWS that meets science-based criteria for energy dissipation of the attraction flow while maintaining water quality standards.

(E) WFL Construction, Part 5. The Licensee shall conduct an assessment of the ZOP downstream of the WFL to ensure that it continues to be passable over the range of flows in which the WFL is operational.

11. Improving Fish Lift Capacity

Presented below are physical and operational modifications to the Project intended to address deficiencies in fish lift capacity. Implementation of modifications in the capacity tiers is independent of the implementation of similar items used to improve passage efficiency. Both

attraction and capacity improvements can be required simultaneously if deemed appropriate from the most recent study results and capacity calculations.

Capacity shall be deemed exceeded if daily capacity is exceeded more than 5 days in a passage season. If an index of fullness indicates that one hopper is consistently fuller than the other, capacity shall be prorated based on that index. Over the Term, depending on the length of the migratory run (as defined by the cumulative five percent to ninety-five percent) the number of days designated to define overcapacity may be changed by MDE in consultation with the Licensee.

11.1 Tier I (Adjusted Efficiency 70% — 85%)

Within 2 years following the Project having been deemed by MDE to have exceeded capacity, the Licensee shall submit to MDE for approval a plan to implement new additional entrances with a separate crowder and holding pool. The new hopper will be accessed from the new entrance and through a proposed collection gallery that will span the full length of the Kaplan turbine section of the powerhouse. The new entrances and the collection gallery are intended to provide access to the EFL from across the Kaplan section and the Francis turbine section of the powerhouse. The new collection gallery will be located against and along the powerhouse and shall be adaptive for fish including Eels. The new collection gallery shall be located against and along the powerhouse wall.

11.2 Tier II (Adjusted Efficiency less than 70%)

Within 3 years following any failure by the Licensee to reach upstream passage efficiency due to inadequate fishlift capacity, the Licensee shall submit to MDE for approval a plan to implement a new WFL (as described in Section 10.2(c)(ii) of this MDE-FPIP) in the west corner of the powerhouse tailrace. The Licensee will operate the new WFL as a Tailwater to headpond fish lift with a collection facility for fish sampling that could be used as a fish trap and transport facility. The WFL shall have a trap system with two independent holding facilities allowing passage while both traps are being operated.

12. Fish Passage Effectiveness Monitoring

Efficiency testing of both upstream and downstream fish passage, and determining mortality rates of Shad when using trap and transport are critical to evaluating the success of fish passage structures and operations, diagnosing problems, and determining both when modifications are needed and what modifications are likely to be effective. These measures are essential to ensuring the effectiveness of fishlifts over the Term, particularly in cases where the increasing size of fish populations as a result of improved upstream passage may also lower upstream fish passage efficiencies due to migrating fish crowding and exceeding daily or annual lift capacity, thus keeping some fish from successfully passing the Dam and limiting net effectiveness.

12.1 Fishway Effectiveness Monitoring Plan

The Licensee shall submit to MDE for approval a Fishway Effectiveness Monitoring Plan ("FEMP") no later than March 1, 2019. The FEMP will contain the plans for the studies described in Sections 12.2 through 16 of this MDE-FPIP. If MDE requests a modification of the FEMP, the Licensee shall file a written response with MDE within 30 days. Any modifications to the FEMP by the Licensee will require approval by MDE prior to implementation.

The Licensee shall submit yearly interim study reports to MDE following the conclusion of each study year. The interim and final reports for upstream passage studies will be submitted to MDE by December 31st of each study year. The interim and final reports for downstream passage studies will be submitted to MDE by August 1 following each study year. The final study report will include results for each life stage and type of study conducted with a determination of the Licensee's success or failure in achieving the passage efficiency criteria established in this Plan. In conjunction with submitting the final study report(s), the Licensee shall also provide electronic copies of all data collected from studies to MDE.

The Licensee shall consult with MDE to discuss the FEMP. This meeting will occur no later than January 31 each year unless the Licensee and MDE agree on a different date. At this annual meeting the participants shall discuss with the fish passage results from the previous year, review regulatory requirements for fish lift and Eel passage operations, and discuss any upcoming modification or testing the Licensee proposes for the upcoming fish passage season.

12.2 Initial Efficiency Test, Post-Modification Efficiency Tests, and Periodic Efficiency Tests for Upstream Passage of Shad and Herring

The *Initial Efficiency Test* and any *Post-Modification Efficiency Tests* will consist of a three-year fish tagging and monitoring study of Shad and Herring using radio telemetry, or other best tracking technology. If after two years the criteria cannot mathematically be obtained by a third year of study, the initial efficiency test will be concluded. The *Periodic Efficiency Tests* will consist of a two-year Shad-tagging study using the same techniques unless the Licensee elects, with MDE concurrence, to conduct an additional one year of study. The *Initial Efficiency Test* will begin in the 5th passage season after New License issuance. The *Post-Modification Efficiency Test* will begin in the first fish passage season immediately following any required modification implemented from the tiers. The *Periodic Efficiency Test* will be conducted on every 5th year after a previous study determines that the *Adjusted Efficiency* of the Project is achieving 85 percent passage efficiency for Shad. Early Periodic Efficiency Tests may be delayed by up to two years to coincide with the schedule for tests at Muddy Run agreed upon in the 2015 Settlement Agreement between USFWS and the Licensee.

These studies will use sufficient numbers of test fish to account for drop-back and other fish loss. These fish will be collected from a downstream location, and be representative of the migrating population as a whole. Specific details of the telemetry studies such as sample sizes, collection of and release location of tagged Shad and Herring, arrangement of telemetry receivers,

and appropriate statistical analyses shall be developed by the Licensee in conjunction with MDE and other resource agencies. The Licensee shall submit final study plans to MDE for approval prior to initiating any study.

13. Trap and Transport Credit for Shad

The Licensee shall receive additional credit toward the upstream passage efficiency criterion for adult Shad that are trapped and transported upstream of York Haven Dam. MDE will recognize the benefits to the species by giving credit towards the calculation of whether the efficiency criterion for upstream Shad passage is met, due to the value to restoration of avoiding the passage of impediments at the upstream hydroelectric projects. Details of the credit toward the efficiency criterion are provided in Appendix A to this MDE-FPIP. Part of the calculation of the credit toward efficiency criterion requires an estimate of the mortality associated with trap and transport operations. Beginning January 1, 2023, the Licensee shall work with MDE and other resource agencies to develop a one-year study to estimate the mortality of fish which are trapped and transported to areas upstream of York Haven Dam. Such a study will include assessment of immediate mortality (mortality occurring during transport) as well as delayed mortality (mortality occurring during some time period after release). The results of the study will be used to modify, as necessary, the mortality input utilized in the trap and truck credit. MDE adopts the Service's proposed methodology for this study as described in Appendix C to this MDE-FPIP; however the Licensee and MDE must reach agreement on the final methodology and final study design post-licensing.

14. Downstream Adult and Juvenile Shad and Herring Effectiveness Testing

The Licensee shall conduct downstream passage effectiveness studies of Shad and Herring in 2027 in coordination with MDE. As part of the FEMP for downstream passage, the Licensee shall evaluate both juvenile and adult life stages using a study protocol developed cooperatively with MDE to include a Reservoir route of passage study and an evaluation of passage survival. A route of passage study will be conducted to determine the routes chosen by downstream migrating fish through the Project under various generation conditions to determine if there are preferred routes of passage at the Dam and variations on survival through each of the routes. The route of passage study will be conducted for 2 years to account for inter-annual variation in flow conditions. The Licensee has the option to extend the route of passage study for an additional year.

If the above study is insufficient to determine survival, a one year separate and discrete passage study for both adult and juvenile Shad and Herring shall be conducted to estimate survival through the Kaplan and Francis turbines under best gate efficiency. This study will commence in the year following the completion of the above study. The effects of trauma due to changes in barometric pressure, such as the expansion and rupture of a fish's swim bladder, ,during turbine passage will be included as part of the turbine survival studies for all life stages when possible. Results of the studies will be used to determine through-Project survival (i.e. via spill, Francis turbines, Kaplan turbines, etc.), and immediate and latent mortality for each route to achieve the passage criteria. If Licensee is unable to achieve the efficiency criteria for

survival based on the results of the downstream studies, MDE may re-open the Certification to address this issue.

15. Fishway Inspections

The Licensee shall provide MDE personnel, DNR personnel, and other MDE-designated representatives, timely access to the fish passage facilities at the Project and to pertinent Project operational records for the purpose of inspecting the fishlifts to determine compliance with the MDE-FPIP.

16. Pre-License Actions Agreed to by the Licensee

16.1 The Licensee agreed to develop and finalize a detailed logistics plan and operating protocol for trap and transport of Shad and Herring from both the EFL and WFL. The Logistics plan was required to address near-term operations, as well as logistics necessary to support the collection and transport of up to 80 percent of the Shad and Herring passing the Project with a maximum transport of 100,000 Shad and 100,000 Herring annually. This plan was to be completed by December 31, 2017. The Licensee shall provide MDE with a status report on the logistics plan and operating protocol for trap and transport of Shad and Herring no later than September 1, 2018. If these items have not yet been completed, Licensee shall complete these items and submit them to MDE by no later than January 1, 2019.

16.2 The Licensee also agreed develop detailed Computational Fluid Dynamics (CFD) models of the zones of passage, in consultation with the Service, to the EFL and WFL to assess the ability of fish to reach the lifts. The Licensee shall provide MDE with a status report on these models no later than September 1, 2018. If these items have not yet been completed, Licensee shall complete these items and submit them to MDE no later than January 1, 2019.

16.3 The Licensee also agreed to develop its initial FOMP (as described earlier) by September 30, 2017. The Licensee shall provide MDE with a status report on the initial FOMP no later than September 1, 2018. If the initial FOMP has not yet been completed, the Licensee shall complete the initial FOMP and submit to MDE no later than September 30, 2018.

17. Items to be completed in 2017 – 2018

The Licensee shall finalize design plans for initial fishlift improvement and improvements to facilitate the trap and transport program by no later than December 31, 2018.

18. Definitions of Certain Terms

In addition to terms defined elsewhere in the Certification and this MDE-FPIP, the following terms have the following meaning when used herein:

Adjusted Efficiency - The calculated fish passage efficiency that accounts for the biological benefit of fish trapped and transported from the Project to areas upstream of other

mainstem dams. This calculated efficiency gives credit towards efficiency targets for the number of fish that are trapped and transported.

Anadromous - migratory fish that spawn in freshwater rivers but spend most of their life in the ocean.

Attraction Efficiency - The proportion of the migrating population that successfully passes a designated downstream point at the Project (i.e. the downstream end of Rowland Island), and successfully enters the fish lift.

Fish Ladder - an engineered ramp-like structure, typically constructed of concrete and/or metal, used to provide upstream fish passage.

Fish Lift - an elevator-like structure with a hopper used to convey fish from the Tailwaters to the headpond of high dams.

Fish Passage Facility - the physical structure of the fishway used to convey fish upstream; with the term being synonymous with "fish lift" at this Project.

Hopper - the structural part of the fish lift used to hold fish as they are transported from the Tailwaters to the head pond.

Safe Passage - the movement of fish through the zone of passage that does not result in any unacceptable stress, incremental injury, or death of the fish.

SRAFRC - Susquehanna River Anadromous Fish Restoration Cooperative.

Trap and Transport or T&T - fish that are collected at a downstream project and loaded in a tank truck and transported and released into some location upstream of that project.

Upstream Fish Passage Efficiency - the percentage of the fish present in the Tailwaters that successfully move through the fish lift and continue upstream migrations; e.g. the proportion of fish that start at point B (downstream end of Rowland Island in the case of the Dam) and passes point E in the diagram set forth in Appendix E to this MDE-FPIP.

Volitional Passage - a fish passage facility that allows fish to swim unimpeded from the Tailwaters to the headpond; fish lifts are not considered volitional passage because the fish rely on the operation of the lifts in order to pass upstream into the headpond.

Zone of Passage (ZOP) - The contiguous area of sufficient lateral, longitudinal, and vertical extent in which adequate hydraulic and environmental conditions are maintained to provide a route of passage through a stream reach influenced by a dam (or stream barrier); e.g. the area between point A and point E in the diagram set forth in Appendix E to this MDE-FPIP.

Appendix A to Attachment #1
Calculation of Fishway Capacity for a 6,500-Gallon Hopper

Biological Parameters:

$\lambda_m = 0.052$ (season/day)	Season-to-season run compression coefficient empirically determined design parameter
$\beta = 0.15$ (day/hr)	Hour-to-hour run compression coefficient empirically determined design parameter
T = 15 min	Lift cycle time (recommended)

Hopper Size:

$Vol_H = 868.9$ ft.^{3}	Estimate of proposed hopper volume (6,500 gallons)
$Vol_{fH} = 0.1$ (ft^3 / lbf)	Volume required per fish-pound, USFWS criterion; for lift times greater than 15 minutes, a 30 percent increase in Vol_{fH} is recommended

Allowable peak biological loadings:

$Flb_h = (Vol_H/v_{fH}*T)$	$Flb_h = 34,756$ lbf/hr	Allowable loading of fish in pounds per peak hour
$Flb_d = Flb_h / \beta$	$Flb_d = 231,706$ lbf/day	Allowable loading of fish in pounds during the peak day
$Flb_s = Flb_d / \lambda_m$	$Flb^s = 4,455,897$ lbf/season	Allowable loading of fish in pounds during an entire season

Appendix B to Attachment #1
Calculating Trap and Transport Credit

Credit Towards an Overall Efficiency Criterion (85 percent of fish entering the Tailrace)

For a given number of Shad trapped and transported we can estimate the number that would need to pass the Dam via the fish lift to result in the same number of spawners upstream of York Haven Dam. This number is termed "lift equivalents" (L_e) and is calculated as:

$$[1] \qquad L_e=(\sum_{i=1}^{n} TTi) \bullet (1-TT_m)/D$$

Where TT_i refers to the number trapped and transported each year during a single or multi-year study to measure passage efficiency, and TT_m is the mortality associated with trapping and transporting Shad. Harris and I lightower (2011) estimated mortality of trapped and transported Shad in the Roanoke River to be 15 percent. However, SRAFRC (1997) gave estimates of mortality for holding Shad prior to trap and transport, mortality during the transport, and delayed mortality following release. When all these factors are considered, the overall mortality associated with trap and transport operations was 6 percent, which was used in this model. The denominator ***(D)*** in equation [1] will be calculated using the maximum efficiency of each of the two upstream dams with the highest passage efficiency over the three year study and the average of these efficiencies. For example, if the highest efficiencies of Holtwood, Safe Harbor, and York Haven Dams over the three year study were 0.60, 0.78, and 0.50, respectively, then the denominator would be calculated as $D = 0.60 \bullet 0.78\ (0.60+0.78)/2 = 0.3229$. It was assumed that other than the mortality associated with trap and transport operations, no other negative impacts on their fitness occurred compared to Shad that would migrate via multiple fish passage facilities to areas upstream of York Haven Dam.

The L_e can be added to the observed number that were lifted past the Dam during the study period to arrive at an adjusted total number that are passed via the fish lift (L_a).

$$[2] \qquad L_a = Le + \sum_{i=1}^{n} TTi)\ Li$$

where L_i is the observed number lifted in each year.
During a radio telemetry study at the Dam, an estimate of passage efficiency will be made and given the total number of Shad actually passed (lifted and released into the Reservoir + trapped and transported upstream), an estimate of the total number of Shad downstream of the Dam during all years of the study can be made.

$$[3] \qquad N = (\sum_{i=1}^{n} Pi)/Eo$$

where P_i is the total number passed each year and E_a is the estimated passage efficiency during the study. Equation [3] also assumes that no mortality is suffered while attempting to pass the Dam.

The variance of N can be estimated by the delta method using the estimated variance of E_a.

[4] $Var(N) = [Var(E_a) / E^4_a E^4] \bullet (\sum_{i=1}^{n} Pi)^2$

The adjusted passage efficiency is then the adjusted number that are lifted during the study divided by the total number of Shad downstream of the Dam during all years of the study.

[5] $E_a = L_a/N$

The associated variance from the delta method is:

[6] $Var(E_a) = [Var(N)/N^4] \bullet L^2_a$

The 95 percent confidence interval for $E_a$can be approximated as:

[7] 95% *C.I. is approximately equal to* 1.96 • square root of $Var(E_a)$

If the upper 95% confidence limit is greater than or equal to the efficiency criterion, then the criterion is considered to be met.

Appendix C to Attachment #1
Trap and Transport Mortality Study

To assess the mortality associated with trap and transport of Shad collected at the Dam and transported to areas upstream of York Haven Dam, a study design similar to that of Millard et al. (2005) will be employed. This study will have both a treatment group (Shad trapped and transported) and a control group (Shad not trapped and transported). The purpose of having both a treatment and a control group is to evaluate both the immediate and delayed mortality associated with T&T operations while controlling for mortality associated with handling stress while carrying out the study.

Control groups will consist of Shad that are caught in the lifts at the Dam, sorted from non-target species, and rather than being loaded into a truck and transported upstream, they will be released to a large holding tank located at the Dam (size to be determined) and monitored for 72 hours post-release.

Treatment groups will consist of Shad that are caught in the lifts at the Dam, sorted from non-target species, loaded into a truck, and driven around in the truck for a length of time equivalent to the trip duration to areas upstream of York Haven Dam. After simulating transport, the Shad will be placed into a holding tank located at the Dam and monitored for 72 hours post-release.

Experimental tanks for both treatment and control groups will be located at the Dam in order to eliminate any confounding effects of differences in water temperature/chemistry between treatment and control groups and to isolate the effects of transport. Experimental tanks will be set up with flow through conditions using water pumped from the Tailrace.

Each week throughout the fish passage season, a truck load's worth of fish (exact number yet to be determined) will be used in both treatment and control groups. Thus, the experiment will be temporally replicated for 4 to 8 weeks depending on the duration of the spawning run in a given year. This will allow assessment of mortality over the range of water temperatures experienced by Shad throughout the season.

During the 72 hour monitoring period, dead Shad will be removed from the tank as soon as they are noticed. Mortality will be quantified as the number of dead Shad divided by the number of Shad that entered either the treatment or control group. Mortality in the treatment group will include all Shad that died during the entire process from loading them into the truck to those found dead at the end of the 72 hour monitoring period.

Statistical Analysis

It will be assumed that total mortality of the treatment group consists of two components: 1) mortality associated with transport and release of the Shad; and 2) mortality associated with experimental handling of the Shad. Thus, total mortality of the treatment group = T&T mortality + handling mortality. The control group would only experience mortality associated with experimental handling. The instantaneous handling mortality rate (m_h) will be estimated from the control group as

$$Mh = -ln(S_c)$$

where S_c is the survival of the control group over all replicates throughout the season. The instantaneous total mortality in the treatment group will be estimated as

$$M_t = -ln(S_t)$$

where S_t is the survival of the treatment group over all replicates throughout the season. The conditional mortality associated with trap and transport (conditioned on handling mortality) is

$$u_{TT}) = A - [(A \bullet M_h) / ln(1 - A)].$$

where A is the fraction of fish that die from all causes ($1-S_1$). This equation is based on the traditional fisheries expression $u = A \bullet F/Z$ where u = the expectation of death from fishing, A = total mortality rate from all causes, F = the instantaneous fishing mortality rate, and Z = the total instantaneous mortality rate. Estimation of the conditional mortality associated with trap and transport (u_{TT}) according the above equation is preferred because it accounts for the probability that the two sources of mortality, trap and transport stress and handling stress, occur simultaneously over the monitoring period (Millard et al. 2005).

Literature cited:

Millard, M.J., J.W. Mohler, A. Kahnle, and A. Cosman. 2005. Mortality associated with catch-and-release angling of striped bass in the Hudson River. North American Journal of Fisheries Management. 25:1533-1541

Appendix D to Attachment #1
Upstream and Downstream Migration Periods for Certain Species

Species	*Upstream Migration Period* [1,2,3]	*Downstream Migration Period* [1,2,3]
Shad	Starting when River temperature reaches 50 ° F, until River temperatures rise above 72 ° F for four consecutive days, but ending no earlier than June 1, and no later than June 15[2]	July 1 through November 15 (juv.) May 1 through July 1, as long as river temperature is above 65 ° F[2] (adult)
Herring	Starting when River temperature reaches 50 ° F, until River temperatures rise above 72 ° F for four consecutive days, but ending no earlier than June 1, and no later than June [2,3,4]	June 15 through October 14 (juv.) April 15 1 through July 1 (adult)

Notes:

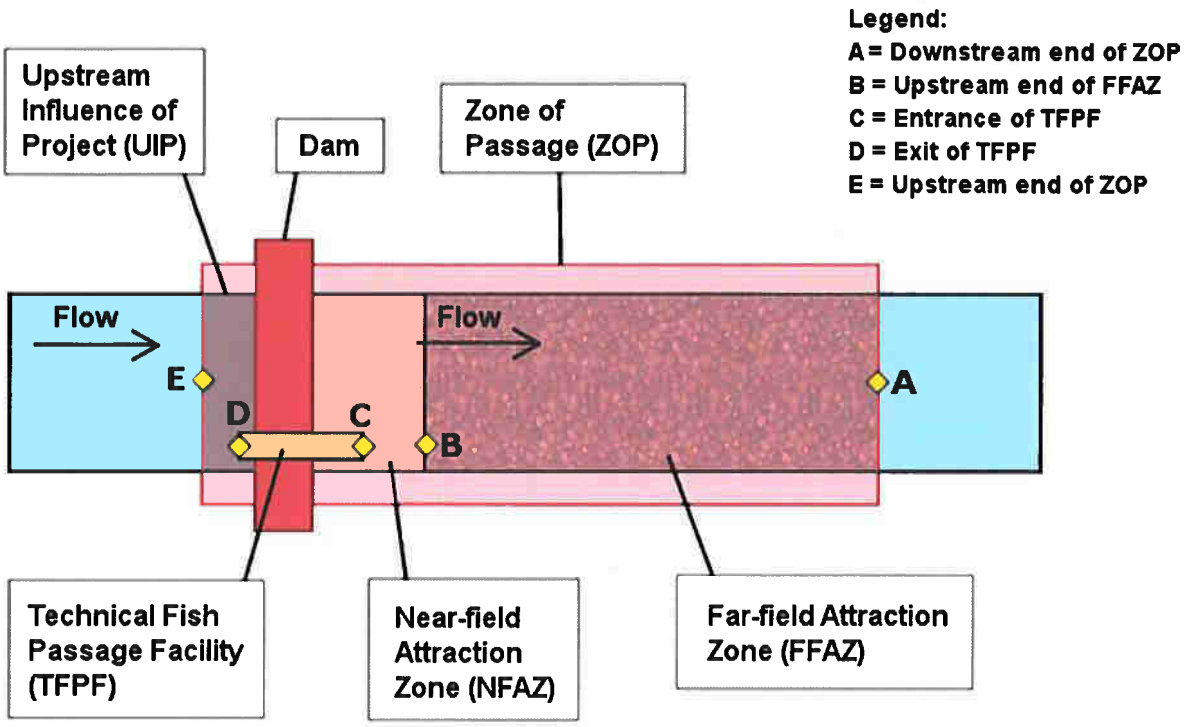
1. Any of these migration periods may be changed during the Term by MDE, based on new information. At any time during the Term, Licensee may submit new information to MDE in support of a request to change the migration periods. In the event MDE seeks to require downstream passage by means other than through the units, the downstream migration periods automatically will be reviewed jointly by MDE, other fishery agencies, and the Licensee.

2. Water temperatures shall be monitored once daily at 11 a.m. at Station 643 or some other location agreed upon by the Licensee and MDE.

3. MDE recognizes that, because of factors outside of the Licensee's control, safety considerations may preclude the personnel from performing duties necessary to commence fish passage measures at the Project by the commencement date. When such conditions arise, the Licensee shall notify MDE, and MDE and the Licensee shall consult regarding the anticipated schedule for commencing such measures.

4. This migration period is based on alewife migration timing from other tributaries to the Bay (Sutherland 2000, p. 9; Eyler et al. 2002, p. 59; Slacum et al. 2003, p. 13).

Appendix E to Attachment #1
Diagram of Fish Passage Definitions



ATTACHMENT #2
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

MDE American Eel Passage Improvement Plan (MDE-AEPIP)

The Licensee shall construct, operate, and maintain Eel fishways at the Dam to pass upstream migrating Eels that arrive at the Project in a safe, timely, and efficient manner. The Project shall also be operated to provide safe, timely, and effective downstream passage of Eels.

Without limiting the generality of Section 2.C.ii of the Certification, in all cases where this MDE-AEPIP requires the Licensee to consult with or make any submission to MDE, the Licensee shall also consult with, or make such submission to DNR, unless otherwise specified.

A. General Provisions

1. For purposes of this MDE-AEPIP, "Upstream Eel Migration Season" is defined as May 1 through November 1 or when fall mean daily River temperature below the Dam is 10 degrees Celsius or less for three consecutive days, whichever is later.

2. For purposes of this MDE-AEPIP, "Downstream Eel Migration Season" is defined as September 15 through February 15 (or whenever River temperature is above 37 degrees Fahrenheit for four consecutive days).

3. Water temperatures shall be monitored hourly at Station 643 or some other location agreed upon by the Licensee and MDE. This initial operational period is based on preliminary data on Eel migration timing from other tributaries to the Bay.

4. MDE, in consultation with DNR, will use the results from the downstream Eel effectiveness monitoring studies conducted pursuant to Section B.18 of this MDE-AEPIP to further refine the Downstream Eel Migration Period throughout the Term.

B. Eel Passage Requirements and Conditions

1. During the Eel passage season starting May 1, 2019, the Licensee shall document congregations of juvenile Eels visually via bi-weekly nighttime surveys during the migration period, unless another method is approved in writing by MDE. The locations surveyed shall focus on the EFL area including inside the EFL and stilling pool(s) and the Dam spillway adjacent to the EFL. Based on the results of the site-determination studies and engineering analysis, the Licensee shall submit an Eel siting report by February 1, 2020 and then shall design, install, operate and maintain temporary mobile traps to inform the potential location of one or more additional permanent Eel trapping facility(s).

2. No later than March 15, 2020, the Licensee shall submit to MDE for approval a plan to construct and operate temporary, exploratory traps at various locations below the Dam, based on the visual assessments, during multiple years, to assess the ability to collect Eels at

locations where they congregate (the "Eel Collection Plan"). Collection facilities for the temporary site determination study shall be similar to those used in the 2011 study conducted by the Licensee. The Eel Collection Plan shall include (a) locations of Eel fishways, (b) description of substrates, (c) attraction flow at the ramps, (d) attraction flow from the spill gates, (e) description of holding tanks, and (f) frequency of trap checks with contingency for likely high collection periods.

3. No later than March 15, 2022, the Licensee shall submit to MDE for approval an "Eel Passage and Restoration Plan", which shall include (a) detailed plans for the design and construction of new permanent East Eel Fishway(s) ("EEF") located in one or more areas that have high potential to capture Eels migrating up the east side of the mainstem River in the Tailrace; (b) details regarding the annual operation and maintenance of all current and proposed Eel Fishways; and (c) proposed attraction flow speed and volume, slopes of the ramps, matting, and methods to reduce predation.

4. The Licensee shall design and install the EEFs within 12 months of MDE approval of the Eel Passage and Restoration Plan, using paired ramps with different substrates, tanks, etc. to provide sufficient capacity for captured Eels. The number of EEFs and their locations, dependent on survey results, will be determined by MDE. If the number of Eels attempting to migrate within an EEF exceeds the maximum capacity of Eels per unit of ramp area, the Licensee shall redesign and construct the EEF to reduce crowding. In addition, the Licensee shall ensure the holding tank has continuous temperature, DO and water flow exchange monitoring devices with alarms that sound in a permanently staffed location if levels of any parameter are outside established limits. Upon observation, the Licensee shall remove, enumerate and report dead Eels. The holding tank shall be designed and operated to hold Eels at densities not exceeding 10 elvers per liter unless otherwise approved by MDE. If deemed necessary by MDE, the Licensee will provide aeration to the holding tanks. Licensee shall provide daily reports to MDE, DNR, and other resource agencies designated by MDE.

5. Upon completion of the EEFs and thereafter as necessary, the Licensee shall consult at least yearly by February 1, with MDE concerning modifications and adjustments to the passage facilities to improve their operation and efficiency and previous year's data.

6. The Licensee shall not make any modifications to any EEF, undertake any construction associated with any EEF, or make any changes to the operation of any EEF without MDE's written approval in advance..

7. Upon modification to any fish lifts, the Licensee shall investigate Eel congregation locations and follow the procedures outlined in Section B.1 of this MDE-AEPIP to assess the need for additional facilities or modification to the existing Eel collection facilities.

8. The Licensee shall include within the Eel Passage and Restoration Plan detailed plans for the conversion of the EEF(s) and the existing West Eel Fishway ("WEF") to volitional passage, which shall be operational by the Upstream Eel Migration Season in 2031 unless MDE states otherwise in writing. Based on the status of Eel passage at the Holtwood, Safe Harbor and York Haven dams and the results of Eel stocking studies, MDE may delay or eliminate the

requirement to convert to volitional passage if the continuation of the trap and transport program is a preferred option for Eel restoration.

9. The Licensee shall operate the existing WEF annually during each Upstream Shad Migration Season in accordance with the approved Eel Passage and Restoration Plan.

10. The Licensee shall operate the WEF and EEF (interchangeably and collectively, the "Eel Fishways") continuously (24 hours per day, 7 days per week) during each Upstream Eel Migration Season during the Term, regardless of whether the Eel Fishways are operated as a trap or a volitional fishway. If the Eel Fishway(s) is located within the EFL during the Shad passage season, the Eel Fishway(s) will be operated at night when the EFL is not lifting unless MDE modifies this requirement in writing.

11. Unless MDE determines that no effective technology is available to enable such testing, the Licensee shall submit to MDE upstream Eel Fishway efficiency studies (each, an "Efficiency Study") for approval, in accordance with this Section B.11. Each Efficiency Study shall be conducted with juvenile Eels in the vicinity and within the Eel Fishways in 2019, or once technology is available, and once every ten years thereafter. Each Efficiency Study shall determine the Eel upstream passage efficiency of all Eel Fishways during the Upstream Eel Migration Season and any issues that impact Eel survival and efficiency through the Eel Fishways. Each Efficiency Study will consist of two components: determining attraction efficiency to the facility and passage efficiency within the facility once an Eel enters the Eel Fishway. If not already tested at the WEF prior to issuance of the Certification, internal Eel Fishway efficiency at the WEF shall be tested in 2019, regardless of testing for attraction and overall passage efficiency. At all other Eel Fishways, internal Eel Fishway efficiency shall be tested in the year immediately after the year in which the Eel Fishway is completed, regardless of testing for attraction and overall passage efficiency. Efficiency Studies will be repeated following all modifications to Eel Fishway operations, physical structures or the fish lifts which impact River flows or the shoreline to evaluate the success of the modifications. If MDE determines that any Efficiency Study cannot be conducted due to the lack of technology, the Licensee shall conduct visual surveys every five years after the Eel Fishway(s) are constructed to locate Eels below the Dam. The Licensee shall provide an annual report on the efficiency or visual study to MDE DNR by December 31 of the study year.

12. Within twelve months after completion of the Eel Fishways on the east side of the Project (at or near the EFL and the east bank of the River), the Licensee will submit to MDE for approval a multi-year study plan to evaluate those facilities, which plan shall include (a) substrate types, (b) attraction flow at each ramp, (c) attraction flow from the EFL attraction flow spill gates, and (d) potential adjustments to the locations of the Eel Fishways.

13. The Licensee shall yearly, or at such other interval as may be approved in writing by MDE, visually assess the numbers and density of Eels using the Eel Fishways during periods when use is anticipated to be high (e.g. increases in discharge or turbidity) to determine if capacity is exceeded.

14. No later than September 1, 2020, the Licensee shall submit to MDE for approval a plan to conduct in-River, post-stocking surveys including one year of baseline (pre-stocking) data to assess the impact of Eel reintroduction into streams (the "Eel Reintroduction Plan"). These post-stocking surveys shall be for three consecutive years and then once every five years thereafter or until MDE agrees in writing to not continue the annual surveys. Provisions in the Eel Reintroduction Plan shall include the following:

(a) Representative stream segments of the tributaries; provided that the Licensee will propose locations and methods for this survey at least one year in advance to MDE for review and approval;
(b) The number, length, and location of transects sampled shall be subject to approval by MDE;
(c) Eels shall be captured by electrofishing or other methods as approved by MDE;
(d) Block netting shall be required on tributary streams; and
(e) Sampling shall include bivalves and crayfish.

During sampling, Licensee shall document the number of Eels captured and collect data from a representative subsample of Eels. Sampled Eels shall be scanned for passive integrated transponder ("PIT") tags and data from recaptured Eels shall be recorded. Captured Eels larger than 200mm will be tagged with PIT tags and released. Should DNR determine that the number of Eels larger than 200mm is excessive, the Licensee shall consult with MDE and DNR to determine if a subsample of Eels may be PIT tagged. Data collected shall include a variety of life history characteristics e.g., length, weight, condition factor and a description of maturity (e.g. elver, yellow phase, silver phase). that can be assessed to determine how well stocked Eels are utilizing the River and tributaries. A portion of the subsample will be sacrificed and examined for age (otolith analysis), gender, and level of *Anguillicoloides crassus* infection.

15. No later than February 1 of each year, beginning in the year after the Eel Reintroduction Plan is implemented, Licensee shall provide MDE an annual report based on the results of the stream surveys performed in the previous year pursuant to the Eel Reintroduction Plan. The report shall include a.description of (a) stream segments surveyed, (b) dispersal of the stocked Eels, (c) estimate the density of stocked Eels, (d) an evaluation of the growth, condition, age, gender, (e) level of infestation with *Anguillicoloides crassus* of Eels, (f) mussel and crayfish survey results.

16. The Licensee shall submit to MDE for approval a plan showing proposed stocking locations for collected Eels to MDE for review 90 days prior to each Upstream Eel Migration Season.

17. Transport of juvenile Eels upstream shall occur as necessary based on the capacity of holding tanks at the Eel Fishways. The holding tanks shall have an automatically engaging back up pump and an alarm that sounds in a daily staffed location if the primary pump malfunctions. The holding tank shall have continuous temperature, DO and gallon/minute water exchange monitoring devices with alarms that sound in a daily staffed location if levels of any parameter are outside of established limits. All Eels shall be moved within one week of capture.

Eels from the holding tank(s) shall be transferred to a transport vehicle equipped with an insulated transport container(s) that shall be covered and aerated. The transport vehicle(s) shall have an automatically engaging back up pump and an alarm that sounds in the cab of the vehicle(s). The transport vehicle shall have continuous temperature and DO monitoring devices with alarms that sound in the vehicle cab if levels of any parameter are outside of established limits. The transport vehicle(s) shall be designed and operated to hold Eels at densities not exceeding 10 juvenile Eels per liter unless otherwise permitted by MDE in writing. Eels shall be trucked to appropriate release locations on the same day of removal from holding. Upon observation, dead Eels shall be removed, enumerated, and reported.

18. The trigger date for initiation of downstream Eel passage studies shall be the date on which MDE, determines that available data indicates that Eels are maturing upstream of the Project in sufficient numbers to require downstream Eel passage studies at the Dam ("Downstream Study Trigger Date"). Within six months after receiving written notice from MDE that the Downstream Study Trigger Date has occurred, the Licensee shall submit to MDE for approval a plan to conduct a silver Eel downstream survival study (the "Downstream Survival Plan"). The Downstream Survival Plan shall (a) be designed to demonstrate continued compliance with the 85% downstream silver Eel survival target; and (b) include ballon tagging study(ies). The Licensee shall provide a report of the study results from implementation of the Downstream Survival Plan within 180 days after the date of study completion. If such results indicate that the Licensee can operate the Project so that it achieves at least 85% downstream passage of Eel through the Project, the Licensee shall incorporate into the Eel Passage and Restoration Plan all operational measures needed to meet this survival rate. If such results do not indicate that the Project can be operated to achieve at least 85% downstream passage survival of Eel, the Licensee shall propose a plan and schedule for mitigation to achieve the maximum possible downstream Eel passage.

19. No later than September 1, 2021, the Licensee shall submit to MDE for approval a plan for implementing radio telemetry monitoring of Eel at the Project year-round for at least three consecutive years (the "Telemetry Plan"). The Telemetry Plan must include route of passage, delay estimates, and project related mortality. If there are an insufficient number of Eels after three years of implementing the approved Telemetry Plan to determine route of passage, delay estimates, and project related mortality, the Licensee shall continue the Telemetry Plan until such determinations can be made.

ATTACHMENT #3
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

MDE Invasive Species Mitigation Plan (MDE-ISMP)

In order to minimize the introduction and spread of aquatic invasive species ("AIS") into the River through the fish lifts at the Dam, the Licensee shall, beginning in September of 2018:

1. The Licensee shall notify DNR and USFWS in accordance with Section 7 of this MD-ISMP if an AIS is (a) collected in the WFL, (b) collected in the EFL, or (c) passed in the EFL into the Reservoir.

2. During EFL Operations, the Licensee shall:

   (a) View the hopper dumping into the fish exit trough. If an AIS is viewed in the hopper or chute, close the gate at the viewing window immediately, and institute a draw-down to remove the AIS from the trough before releasing the remaining fish into the Reservoir.

   (b) Remove any AIS that are observed while conducting tagging operations in the EFL trough.

3. During WFL Operations, the Licensee shall remove any invasive species that are collected in the WFL.

4. The Licensee shall also:

   (a) Retrofit/redesign the EFL no later than March 1, 2019 to remove AIS and allow tagging fish when required.

   (b) Design fishlifts to remove all AIS prior to upstream migration or Tailrace reintroduction while not significantly impacting fish passage.

   (c) Ensure the proper disposal of all AIS captured in the fish lifts.

5. MDE may require the Licensee to implement the following protocol beginning in the 2019 migratory fish passage season that starts when River temperatures reach 48 degrees for three consecutive days and ends when River temperatures rise above 72 degrees for four consecutive days:

   (a) For all AIS collected at the Dam, Licensee shall kill or dispatch the AIS and place it in the freezer used for Shad heads during the tank spawning studies, for DNR and/or USFWS to dispose of such AIS.

(b) If freezer space for storage of AIS becomes limited the Licensee shall notify MDE and DNR.

(c) If freezer space for storage of AIS is not limited, at the end of the season, Licensee shall send the frozen AIS with the Shad heads to the Van Dyke Hatchery and notify MDE and DNR as to the number and type of frozen AIS sent to the Van Dyke Hatchery.

6. MDE reserves the right to adaptably modify conditions for invasive species control, based on a sound science and after consultation with DNR, USFWS and the Licensee. Licensee shall implement any modifications to these conditions as required by MDE on a schedule established by MDE.

7. Agency Notification Protocol: If an AIS is captured and removed or passed in a fish lift, the Licensee shall notify DNR and USFWS within 24 hours. Notification shall include: (a) species name and number observed/collected; (b) disposition of the AIS observed/collected; (c) approximate size of AIS observed/collected; (d) date and time of passage; and (e) estimated flow through the Dam at time of passage.

ATTACHMENT #4
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

Minimum Flow Regime

Time Period	Minimum Flow
January	4,000 cfs
February	4,000 cfs
March	4,000 cfs
April	18,200 cfs
May	18,200 cfs
June	7,500 cfs
July	5,500 cfs
August	4,500 cfs
September 1-14	3, 500 cfs
September 15-30	3,500 cfs
October	4,000 cfs
November	4,000 cfs
December	4,000 cfs

ATTACHMENT #5
To Clean Water Act Section 401 Certification For the Conowingo Hydroelectric Project
FERC Project No. P-405 / MDE WSA Application No. 17-WQC-02

Year 10 Flow Regime

For purposes of the following table, "below normal" at the Marietta Gage means flow less than monthly Q50, and "above normal" means flow greater than or equal to monthly Q50.

Month(s)	Min Flow	Down Ramping Rate	Upramping Rate	Maximum Flow
December-January	11,000 cfs	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
February	12,500 cfs	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
March	24,000 cfs when upstream inflow at the Marietta Gage is below normal; 30,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
April	29,000 cfs when upstream inflow at the Marietta Gage is below normal; 35,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
May	17,500 cfs when upstream inflow at the Marietta Gage is below normal; 25,500 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
June	10,000 cfs when upstream inflow at the Marietta Gage is below normal; 14,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
July	5,500 cfs when upstream inflow at the Marietta Gage is below normal; 8,500 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 10,000 cfs/hour if instream flow is less than 30,000 cfs; Up to 20,000 cfs/hour if upstream flow is between 30,000 and 86,000 cfs	Up to 40,000 cfs/hour	65,000 cfs
August	4,500 cfs when upstream inflow at the Marietta Gage is below normal; 6,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
September	3,500 when upstream inflow at the Marietta Gage is below normal; 5,500 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	65,000 cfs
October	4,500 cfs when upstream inflow at the Marietta Gage is below normal; 6,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None
November	6,000 cfs when upstream inflow at the Marietta Gage is below normal.; OR 11,000 cfs when upstream inflow at the Marietta Gage is above normal.	Up to 20,000 cfs/hour	Up to 40,000 cfs/hour	None

IN THE CIRCUIT COURT FOR BALTIMORE CITY, MARYLAND

EXELON GENERATION COMPANY, LLC 300 Exelon Way Kennett Square, PA 19348 Plaintiff, v. MARYLAND DEPARTMENT OF THE ENVIRONMENT 1800 Washington Boulevard Baltimore, MD 21230 **Serve On:** Benjamin H. Grumbles Secretary Maryland Department of the Environment 1800 Washington Boulevard Baltimore, MD 21230 Defendant.	)	Civil Action No. _____
PETITION OF EXELON GENERATION COMPANY, LLC 300 Exelon Way Kennett Square, PA 19348 Petitioner, FOR JUDICIAL REVIEW OF THE DECISION OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT 1800 Washington Boulevard Baltimore, MD 21230 IN THE CASE OF CLEAN WATER ACT SECTION 401 CERTIFICATION FOR THE CONOWINGO HYDROELECTRIC PROJECT FERC PROJECT NO. P-405 I MDE WSA APPLICATION NO.17-WQC-02	)	

COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF, AND IN THE ALTERNATIVE, PETITION FOR JUDICIAL REVIEW AND COMPLAINT FOR MANDAMUS

Plaintiff Exelon Generation Company, LLC ("Exelon"), by and through its undersigned attorneys, hereby files this consolidated Complaint for Declaratory Relief, Petition for Judicial Review, and Complaint for Mandamus against the Maryland Department of the Environment ("MDE") seeking declaratory and injunctive relief concerning, or in the alternative, judicial review of, MDE's *Clean Water Act Section 401 Certification for the Conowingo Hydroelectric Project, FERC Project No. P-405 I, MDE WSA Application No. 17-WQC-02.*

Introduction

1. Exelon is the longstanding owner and operator of the Conowingo Hydroelectric Project ("Conowingo Project"), a dam and electric generating facility on the lower Susquehanna River that generates more renewable electricity than any other facility in Maryland. Because the Project is required to renew its operating license from the Federal Energy Regulatory Commission ("FERC"), Exelon is required by the federal Clean Water Act ("CWA") to obtain a certification from Maryland that the Project's discharge will comply with applicable provisions of the CWA and state law. *See* 33 U.S.C. § 1341. On April 27, 2018, the Maryland Department of the Environment ("MDE") issued a "Clean Water Act Section 401 Certification for the Conowingo Hydroelectric Project" (the "Certification"), in response to Exelon's application (MDE WSA Application No. 17-WQC-02). It then submitted that Certification to FERC so that its conditions would become conditions on Exelon's federal license.

2. The Certification is unlawful in many ways. The Certification imposes on Exelon the sole responsibility to remove from the Susquehanna River pollutants that Exelon did not introduce into the river and that flow to the Conowingo Project from upstream pollution sources, or to pay Maryland a fee in lieu of that removal that would exceed $172 million annually, or more than $7 billion over the term of the Project's FERC license. Obligating Exelon to remove

pollution discharged by others into the Susquehanna River is unprecedented, and it exceeds MDE's authority under federal and state law, is unconstitutional, and lacks reasonable support.

3. MDE also acted unlawfully by issuing the Certification as "the Department's Final Decision" and filing it with FERC as such. Under Maryland law, the Certification could not lawfully be issued as a final decision because the contested case hearing that Exelon is entitled to receive — under the governing statutes and regulations, the Federal Constitution, and the Maryland Declaration of Rights — has not yet occurred. But because MDE nonetheless designated the Certification as "final" and filed it as such with FERC, FERC could, at any time, incorporate the Certification's unlawful conditions into Exelon's federal operating license, threatening immediate and irreparable harm to the Conowingo Project and to Exelon.

4. In this action, Exelon seeks declaratory and injunctive relief. In particular, the Court should declare that MDE could not lawfully issue the Certification as a "final decision." Additionally, it should declare that the Certification is void, invalid, and without effect, and issue an injunction forbidding MDE from relying upon the Certification for any purpose and requiring MDE to notify FERC that it is withdrawing the Certification as non-final. MDE's actions were unlawful without regard to the merits of the Certification, and if the Court grants this relief, it need not address the Certification's merits.

5. In the alternative, if the Court determines that the Certification ***was*** lawfully issued as a "final decision," or is otherwise subject to judicial review on the merits, Exelon asks the Court — in accordance with these consolidated pleadings — to find and declare that the Certification is immediately reviewable and proceed to review, and invalidate, the Certification on its merits. While Exelon is simultaneously seeking reconsideration before MDE, reconsideration is not a prerequisite to judicial review. Moreover, because MDE has filed the

Certification with FERC, which may incorporate the Certification's unlawful conditions into Exelon's operating license at any time, the Certification inflicts immediate and irreparable harm on Exelon, and postponing judicial review would result in irreparable harm. The Court has inherent judicial authority "to review and correct actions by an administrative agency which are arbitrary, illegal, capricious or unreasonable." *Harvey v. Marshall*, 389 Md. 243, 275 (2005) (citations omitted). In particular, and without limitation, the Court may review "orders that impose on a party an immediate impact similar in nature to that of an injunction," as does the Certification. *Holiday Spas v. Montgomery Cty. Human Relations Comm'n*, 315 Md. 390, 397 (1989).

6. The Court should not, and cannot, allow MDE to claim that the Certification is final under Maryland law (and thus could lawfully be filed at FERC), yet still subject to an administrative contested case hearing and not yet ripe for judicial review. The Certification imposes immediate obligations, and immediate irreparable harm, on Exelon. MDE cannot simultaneously impose those obligations and that harm while denying Exelon access to a judicial forum. Instead, MDE must either admit that the Certification was not genuinely a final decision or defend the Certification as a final decision before this Court.

COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF

Parties

7. Plaintiff Exelon Generation Company, LLC is a Pennsylvania limited liability company with its headquarters at 300 Exelon Way, Kennett Square, PA 19348. Exelon is a fully owned subsidiary of Exelon Corporation, a Pennsylvania public corporation with its headquarters in Chicago, Illinois.

8. Defendant Maryland Department of the Environment is an administrative agency of the State of Maryland. It is the Maryland agency that has responsibility for carrying out and enforcing the provisions of Maryland's Environment Code and the rules and regulations adopted under it, including Code of Maryland Regulations ("COMAR") 26.08.02.10, which governs Maryland's process for issuing certifications under CWA Section 401, 33 U.S.C. § 1341.

Jurisdiction

9. This Court has jurisdiction over this action pursuant to Sections 1-501 and 3-403 of the Courts and Judicial Proceedings Article of the Annotated Code of Maryland. This Court has jurisdiction pursuant to Md. Code Ann., Cts. & Jud. Proc. §1-501 under the Court's full common-law and equity powers and all the additional powers and jurisdiction conferred by the Constitution and by law. Pursuant to Md. Code Ann., Cts. & Jud. Proc. §3-403, it is within this Court's jurisdiction to provide declaratory relief. Further, this Court has jurisdiction under its inherent judicial authority "to review and correct actions by an administrative agency which are arbitrary, illegal, capricious or unreasonable." *Harvey v. Marshall*, 389 Md. 243, 275 (2005) (citations omitted).

10. While Exelon is also seeking reconsideration of the Certification pursuant to COMAR 26.08.02.10(F)(4), the Certification states that this request "does not stay the effectiveness of the Certification." Exelon's request for administrative reconsideration does not deprive the Court of the authority to provide the relief sought herein because:

a. A request for reconsideration is not a prerequisite for judicial review (*see, e.g.*, COMAR 26.01.02.38).

b. Exelon has no administrative remedies to exhaust for the unlawful conduct sought to be redressed in this action — namely, MDE's unlawfully deeming

the Certification a "final decision" before a contested case proceeding has occurred, and MDE's filing the Certification as such with FERC.

c. Even where an administrative process is not complete, the Court may review "orders that impose on a party an immediate impact similar in nature to that of an injunction." *Holiday Spas v. Montgomery Cty. Human Relations Comm'n*, 315 Md. 390, 397 (1989). Here, the Certification's issuance as a "final decision" has a direct and immediate impact on Exelon, including because FERC may incorporate the Certification's unlawful conditions into Exelon's operating license at any time.

Venue

11. Venue is proper in the Circuit Court for Baltimore City pursuant to Section 6-201 of the Courts and Judicial Proceedings Article of the Annotated Code of Maryland because Defendant carries on regular business and maintains its principal office in Baltimore City.

Factual Background

The Conowingo Project

12. Exelon owns and operates the Conowingo Project, a 573-megawatt hydroelectric power plant located on the lower Susquehanna River in Maryland.

13. The Susquehanna River flows for about 450 miles through New York and Pennsylvania and then through Maryland for about 15 miles before emptying into the Chesapeake Bay, North America's largest estuary. The watershed for the Susquehanna River drains a land area of more than 27,000 square miles and includes over 40,000 miles of waterways in New York, Pennsylvania, and Maryland upstream of the Conowingo Project.

14. The Conowingo Project is located about ten miles upstream of where the Susquehanna River flows into the Chesapeake Bay.

15. Since its construction in 1928, the Conowingo Project has provided multiple benefits to the Chesapeake Bay, surrounding communities, and the State of Maryland.

16. Though never required by law to perform a pollution-reduction function, the Conowingo Project historically has protected the water quality of the lower Susquehanna River and the Chesapeake Bay by trapping some of the nutrient pollution introduced into the River by upstream sources in Pennsylvania and New York, reducing its potential to reach the Bay.

17. The pollutants at issue are generated upstream of the Project.

18. The Conowingo Project also provides benefits to wildlife. It provides breeding, nesting, and foraging grounds for the American Bald Eagle and helps migratory and native fish travel over the dam for spawning in the Susquehanna River, using multimillion-dollar fish lifts.

19. For nearby residents as well as visitors, the Conowingo Project provides opportunities for educational programs and for recreation, including boating, hiking, fishing, and birdwatching. It provides 15 recreational facilities and public-access areas, including boat launches, marinas, and scenic overlooks.

20. The Conowingo Project generates approximately $273 million in annual economic benefits to Maryland and its local communities by supporting full-time jobs, driving tourism in Cecil and Harford Counties, and contributing to local and state tax revenues.

FERC Relicensing of the Conowingo Project and State Certification Under Section 401 of the Clean Water Act

21. Exelon is seeking renewal by FERC of its operating license for the Conowingo Project for a term of 50 years.

22. As part of the relicensing process for federal hydroelectric facilities, applicants are required to seek a state certification under CWA Section 401. That statute provides States the opportunity to review requests by applicants for federal licenses and to certify whether the discharge associated with the activity being licensed will comply with specific CWA provisions. 33 U.S.C. § 1341(a)(1).

23. A State may grant a certification under this Section ("a 401 certification"), either with or without conditions, deny a certification, or waive its power to grant or deny. 33 U.S.C. § 1341(a)(1).

24. In providing a conditional 401 certification, a State may "set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure" that the applicant "will comply" with various limitations under designated CWA provisions, where applicable, "and with any other appropriate requirements of State law." 33 U.S.C. § 1341(d).

25. Limitations or requirements set forth in a conditional 401 certification "shall become a condition on [the applicant's] Federal license." *Id.* FERC believes that it lacks the authority to review the legality of State-imposed conditions and is required to incorporate them in the federal hydroelectric license, even if they are inconsistent with federal law.

26. MDE has promulgated procedural regulations for considering requests for 401 certifications at COMAR 26.08.02.10.

27. MDE first provided a 401 certification to the Conowingo Project in 1975.

28. The 1975 Certification contained a single condition pursuant to Section 401(d). It required the Conowingo Project to "be operated at all times in such a manner as to conform to the requirements contained in State Permit No. 75-DP-0491 attached hereto."

29. The 1975 Certification has never been withdrawn and remains valid today.

30. The State has continuously renewed State Permit No. 75-DP-0491, with the most recent renewal occurring in 2014 and numbered State Permit No. 10-DP-0491.

31. State Permit No. 10-DP-0491 remains valid and does not expire until September 30, 2019.

Exelon's Application to MDE for 401 Certification

32. On January 31, 2014, Exelon submitted a request to MDE for a 401 certification in connection with the FERC relicensing of the Conowingo Project.

33. In response to the application, MDE asked Exelon to conduct an additional study to understand the impacts of sediment transport on water quality in the Susquehanna River and the Chesapeake Bay ("Sediment Study").

34. While Exelon believed its application was complete and that no additional study was required for MDE to issue a 401 certification for the Conowingo Project, in December 2014 Exelon entered into an agreement with MDE to work with Maryland agencies, the U.S. Army Corps of Engineers, the U.S. Geological Survey, the University of Maryland Center for Environmental Science, and the U.S. Environmental Protection Agency ("EPA") to design and conduct a multi-year Sediment Study to provide additional information to MDE.

35. States must act on applications for 401 certifications within one year, but the Sediment Study would not be completed within that time. On December 4, 2014, cognizant of MDE's desire for additional study, Exelon provided MDE with more time by withdrawing its application for a 401 certification and then timely refiling.

36. Exelon refiled its application for a 401 certification on March 3, 2015, and withdrew that application on February 5, 2016, pending conclusion of the Sediment Study.

37. Exelon again refiled its application on April 25, 2016, and withdrew that application on February 17, 2017.

38. Each time Exelon withdrew and refiled its application, it did so to cooperate with MDE's stated desire for more time to study the 401 certification request.

39. On March 13, 2017, MDE indicated that it expected to receive Exelon's resubmission no later than May 18, 2017, and would, upon receiving the resubmission, initiate its review of the water-quality impacts associated with the Conowingo Project.

40. On May 17, 2017, Exelon submitted another request to MDE for a 401 certification in connection with the relicensing of the Conowingo Project.

41. MDE held a public hearing on Exelon's application on December 5, 2017.

42. The studies that Exelon submitted to MDE as part of its request and the information in the record before MDE demonstrate that the Conowingo Project is not the source of pollution entering the Susquehanna River. They also demonstrate that the Project is meeting all applicable state water-quality standards in waters immediately downstream.

MDE's Issuance of the Present 401 Certification

43. On April 27, 2018, MDE issued the Certification to Exelon. A copy of the Certification is attached as **Exhibit A**.

44. The Certification asserts that "[t]his is a final decision on the Application."

45. The Certification states that Exelon may file a "request for reconsideration," and that after MDE's "decision on the request for reconsideration, a contested case hearing shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et

seq." Yet it also states that any such "request ... does not stay the effectiveness of this Certification."

46. MDE published the Certification in the *Maryland Register* on May 11, 2018. In a departure from the State's previous 401 certifications and previous recognition by the State and others of the Conowingo Project's benefits to the Bay, the Certification asserts that "the Project adversely impacts water quality in the State of Maryland."

FERC's Imminent Incorporation of the Certification into Exelon's Operating License

47. Under Section 401(d), the conditions of a 401 certification "shall become a condition on any Federal license or permit" to which the 401 certification pertains. As soon as certification conditions are incorporated by FERC into a license or permit, they become binding and enforceable.

48. Because MDE has labeled the Certification as a "final decision," submitted the Certification to FERC, and stated that it will not stay the "effectiveness" during any further administrative consideration, FERC could incorporate the Certification's conditions into the Conowingo Project's license at any time pursuant to Section 401(d).

49. The incorporation of the Certification into the FERC license will cause immediate harm to Exelon. Exelon will be subject to obligations that are unlawful, arbitrary and capricious, not supported by substantial evidence, an abuse of discretion, and in violation of the U.S. and Maryland Constitutions.

50. Exelon is challenging the Certification before this Court as well as through the reconsideration process set forth by MDE and before the United States District Court for the District of Columbia, so that the unlawful conditions cannot be imposed on Exelon.

The Unlawfulness of the Certification's Conditions

51. To grant Exelon the relief it principally requests, the Court need not consider the merits of the Certification's conditions or address whether the Certification's conditions are substantively unlawful.

52. To the extent the Court deems it necessary or helpful for Exelon to identify the legal errors in the Certification, Exelon's Protective Petition for Reconsideration and Administrative Appeal is attached as **Exhibit B** and incorporated here by reference.[1] Exelon further alleges as follows:

53. The Certification makes Exelon, as the Conowingo Project's owner, responsible for cleaning up pollution that it did not create and has no reasonable way to remove.

54. The Certification purports to impose a requirement that the Project "shall annually reduce" by millions of pounds the amount of nitrogen and phosphorus discharged into the Susquehanna River by upstream sources (the "Required Nutrient Reductions"). MDE is demanding that the Conowingo Project remove from the Susquehanna River nutrients that were not added to the river by the Conowingo Project, but already are present in the Susquehanna River before the river water reaches the Project.

55. MDE has not identified effective or reasonable means for achieving the Required Nutrient Reductions at the Conowingo Project. Rather than suggest a plausible path forward, MDE seeks payment from Exelon in lieu of the Required Nutrient Reductions in excess of $172 million annually — more than $7 billion over the term of the Project's FERC license — while continuing to fail to address pollution at its source. This fee for pollution that Exelon did not create amounts

[1] Exelon has not attached the exhibits to the Protective Petition for Reconsideration and Administrative Appeal.

to nearly a half-million dollars per day, each day, for more than 40 years. This amount exceeds, by orders of magnitude, the economic value of the Conowingo Project as an operating asset.

56. Additionally, the Certification requires the Project to remove "all" visible trash and debris from the Susquehanna River, regardless of where that trash entered the river along its 464-mile course, or who deposited it.

57. The Certification also requires the Project to take onerous measures to stop invasive species of fish from moving upstream, even though the dam does not contribute to the upstream migration of invasive fish species, but instead helps block such migration.

58. This unprecedented shifting of responsibility away from the pollution sources and onto Exelon exceeds MDE's authority under state and federal law.

59. MDE has unilaterally imposed this obligation on Exelon rather than working collaboratively through EPA's Chesapeake Bay Program, which requires that sources of pollution be held accountable and that responsibility for improving the Bay's water quality be equitably allocated across the Bay's entire watershed. MDE faced the risk that EPA would allocate much of the responsibility for reducing pollution in the watershed to the State of Maryland, which in turn would have been required to regulate in-state polluters more stringently.

Claims for Relief

COUNT I:

DECLARATORY JUDGMENT THAT MDE DID NOT LAWFULLY ISSUE A "FINAL DECISION"

60. Exelon repeats and incorporates by reference every allegation in the preceding paragraphs.

61. On May 17, 2017, Exelon submitted a request to MDE for a 401 certification in connection with the relicensing of the Conowingo Project.

62. On April 27, 2018, MDE issued the Certification as a "final decision."

63. The Certification states that "[t]his is a final decision on [Exelon's] Application" and that "[a]ny request for an appeal does not stay the effectiveness of this Certification."

64. On May 8, 2018, MDE submitted the Certification to FERC by filing it in the docket for the Conowingo Project's license renewal.

65. Under Section 401(d) of the Clean Water Act, the conditions of a 401 certification "shall become a condition on any Federal license" to which the certification pertains. 33 U.S.C. § 1341(d).

66. The Certification, however, could not lawfully be issued as a "final decision."

67. MDE's issuance of the Certification as a "final decision" violated Exelon's statutory rights by issuing a "final decision" before the contested case hearing that MDE recognizes "shall be available in accordance with the applicable provisions of State Government Article, § 10-201, et seq., Annotated Code of Maryland."

68. Under State Government Article, § 10-202(d)(2), contested case procedures apply, and a "final decision" cannot lawfully issue until the contested case hearing is complete, when an agency "regulation expressly, or by clear implication, requires the hearing to be held in accordance with this subtitle." Here, COMAR 26.08.02.10(F)(4)(b) does so by recognizing Exelon's entitlement to review "in accordance with the applicable provisions of State Government Article, § 10-201 et seq., Annotated Code of Maryland" — *i.e.*, the contested case procedures.

69. Under State Government Article, § 10-201, *et seq.*, an agency's "final decision" is the decision that comes ***after*** the contested case hearing, not the nonfinal decision that precedes this hearing.

70. In addition, under State Government Article, § 10-202(d), contested case procedures apply, and a "final decision" cannot lawfully issue until the contested case hearing is complete, to proceedings involving "the grant, denial, renewal, revocation, suspension, or amendment of a license," or "a right, duty, statutory entitlement, or privilege of a person," that "is required by statute ***or constitution*** to be determined ***only after*** an opportunity for an agency hearing" (emphasis added).

71. Here, due process entitles Exelon to a hearing prior to issuance of a final decision, because the Certification effects a deprivation of liberty or property:

a. Exelon has a protected property interest as the Conowingo Project's owner and in the Conowingo Project's economically beneficial use as a generation facility;

b. Exelon has a protected property interest in continuing to operate the Conowingo Project under State Permit No. 10-DP-0491;

c. Exelon has a protected property interest in the renewal of the Conowingo Project's 401 certification, as is required for the renewal of the Conowingo Project's operating license. "If [MDE] determines the proposed activities will not cause a violation of applicable State water quality standards, the Department ***shall issue*** the water quality certification." COMAR 26.08.02.10(E)(1) (emphasis added). Exelon thus has a legitimate claim of entitlement to a lawful 401 certification.

d. Due process generally "requires a ***predeprivation*** hearing before the State interferes with any liberty or property interest enjoyed by its citizens." *Parratt v. Taylor*, 451 U.S. 527, 537 (1981) (emphasis added), *overruled in part on other grounds by Daniels v. Williams*, 474 U.S. 327 (1986).

72. Accordingly, the Certification cannot lawfully constitute a "final decision" under State Government Article, § 10-202(d), and so cannot be lawfully transmitted to FERC for incorporation into Exelon's operating license.

73. Separately, the issuance of the Certification as a "final decision" also violated the CWA and its implementing regulations because several of the Certification's provisions, including Sections 2 and 7, contain conditions that provide for planning, additional studies, reopening, and modification by MDE and would allow MDE to impose as-yet-unknown additional requirements on the Conowingo Project.

74. Because MDE has labeled the Certification a "final decision," has submitted the Certification to FERC, and has stated that it will not stay the Certification's effectiveness during any appeals, FERC could incorporate the Certification's conditions into the Conowingo Project's license at any time under Section 401(d).

75. The incorporation of the Certification into the FERC license will cause immediate harm to Exelon, as Exelon will be subject to obligations that are unlawful, arbitrary and capricious, not supported by substantial evidence, an abuse of discretion, and in violation of the U.S. and Maryland Constitutions.

76. Exelon is entitled to a declaratory judgment that, despite MDE's issuance of the Certification as a "final decision," the Certification was not lawfully issued as a final decision and that the Certification is void, invalid, and without effect.

77. Exelon is also entitled to an injunction enjoining MDE from relying upon the Certification for any purpose and requiring MDE to withdraw the Certification from FERC.

Prayer for Relief

78. WHEREFORE, Exelon respectfully requests that the Court enter a judgment in its favor and against Defendant, and provide to Plaintiff the following relief:

a. A declaratory judgment and decree that that MDE could not lawfully issue the Certification as a "final decision."

b. A declaratory judgment and decree that the Certification is void, invalid, and without effect.

c. An injunction forbidding MDE from relying upon the Certification for any purpose and requiring MDE to notify FERC that it is withdrawing the Certification.

d. A stay of the Certification while this action is pending.

e. An award of attorneys' fees and costs pursuant to 42 U.S.C. § 1988.

f. Such other legal or equitable relief as this Court deems just and proper.

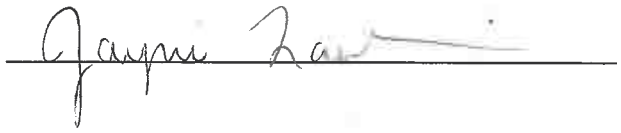
PETITION FOR JUDICIAL REVIEW AND COMPLAINT FOR MANDAMUS

To the extent that the Certification was properly issued as a "final decision," or is otherwise subject to judicial review, Petitioner Exelon, by its undersigned counsel and pursuant to Maryland Rules 7-202 and 7-402, COMAR 26.08.02.10, and State Government Article, § 10-201 *et seq.*, hereby requests judicial review of the Maryland Department of Environment's *Clean Water Act Section 401 Certification for the Conowingo Hydroelectric Project, FERC Project No. P-405 I, MDE WSA Application No. 17-WQC-02* (the "Certification"). Exelon seeks such review via a Petition for Judicial Review to the extent that judicial review is authorized by statute, and via mandamus to the extent that judicial review is not expressly authorized by law. Exelon was a party to the administrative proceeding for which judicial review is requested. Moreover, Exelon is adversely affected by the Certification, which will impose billions of dollars in burdens on Exelon when it is incorporated into the operating license for the Conowingo Hydroelectric Project by the Federal Energy Regulatory Commission.

WHEREFORE, Exelon respectfully requests that this Honorable Court review the Certification and declare it invalid.

Respectfully submitted,

Dated: May 25, 2018



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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

EXELON GENERATION COMPANY, LLC, 300 Exelon Way, Kennett Square, PA 19348,	)	
Plaintiff,	)	
v.	)	Civil Action No. _____
BENJAMIN H. GRUMBLES, Secretary of the Environment, State of Maryland, Montgomery Park Business Center, 1800 Washington Boulevard, Baltimore, MD 21230, *in his official capacity*,	)	
and	)	
D. LEE CURREY, Director, Water and Science Administration, Maryland Department of the Environment, State of Maryland, Montgomery Park Business Center, 1800 Washington Boulevard, Baltimore, MD 21230, *in his official capacity*,	)	
Defendants.	)	

COMPLAINT

Plaintiff Exelon Generation Company, LLC ("Exelon" or "Plaintiff") hereby files this Complaint for declaratory and injunctive relief against Defendants Benjamin H. Grumbles and D. Lee Currey.

INTRODUCTION

1. The Chesapeake Bay is the largest estuary in the United States and a critical natural resource for the people of Maryland. Exelon, through its subsidiaries, delivers electricity to the

overwhelming majority of Maryland homes and businesses, and Exelon strives to support the environmental goals of all its customers and the States in which the Company operates. Exelon also is the owner and operator of the Conowingo Hydroelectric Project ("Conowingo Project"), a dam and hydroelectric facility on the lower Susquehanna River that generates more renewable electricity than all other facilities in the State of Maryland combined. Exelon has been, and remains, committed to operating the Project in a manner that is environmentally responsible in all respects.

2. The Project is required to renew its operating license from the Federal Energy Regulatory Commission ("FERC"). As part of that process, Exelon is required by the federal Clean Water Act ("CWA") to obtain a certification from Maryland that the Project's discharge will comply with applicable provisions of the CWA and state law.

3. This Complaint arises from several steps the Maryland Department of the Environment ("MDE") has taken with respect to the CWA Certification (the "Certification") for the Conowingo Project, including (1) MDE's April 27, 2018 issuance of the Certification to Exelon; (2) MDE's May 8, 2018 submission of the Certification to FERC; and (3) MDE's May 11, 2018 publication of the Certification in the *Maryland Register*.

4. For the first time in the nearly century-long operation of the Conowingo Project, the Certification makes the Project's owner responsible for cleaning up pollution that it did not create and has no reasonable way to remove. The Certification purports to impose a requirement that the Project "shall annually reduce" by millions of pounds the amount of nitrogen and phosphorus discharged into the Susquehanna River by upstream sources (the "Required Nutrient Reductions"). MDE is demanding that the Conowingo Project remove from the Susquehanna River nutrients that were not added to the river by the Conowingo Project, but already are present

in the Susquehanna River before the river water reaches the Project. Indeed, since its construction in the 1920s, the Project's dam has protected the Chesapeake Bay (the "Bay") by trapping pollutants that flowed downstream from New York and Pennsylvania, preventing them from reaching the Bay. The source for much of the nitrogen and phosphorus in the Susquehanna River is runoff from agricultural operations in Pennsylvania and New York, hundreds of miles upstream from the Conowingo Project.

5. MDE has not identified effective or reasonable means for achieving the Required Nutrient Reductions at the Conowingo Project. Rather than suggest a plausible path forward, MDE seeks payment from Exelon in lieu of the Required Nutrient Reductions in excess of $172 million annually — more than $7 billion over the term of the Project's FERC license — while continuing to fail to address pollution at its source. This fee for pollution that Exelon did not create amounts to nearly a half-million dollars per day, each day, for more than 40 years. This amount exceeds, by orders of magnitude, the economic value of the Conowingo Project as an operating asset.

6. Additionally, the Certification requires the Project to remove "all" visible trash and debris from the Susquehanna River, regardless of where that trash entered the river along its 464-mile course, or who deposited it. The Certification also requires the Project to take onerous measures to stop invasive species of fish from moving upstream, even though the dam does not contribute to the upstream migration of invasive fish species, but instead helps block such migration.

7. In sum, simply because Exelon's federal license was subject to renewal, the Certification imposes on Exelon the costs of cleaning up a watershed that Exelon did not pollute. This unprecedented decision to impose on Exelon the obligation to remove from the Susquehanna River pollution discharged into the river by others exceeds MDE's authority under federal law.

8. MDE has unilaterally placed this obligation on Exelon rather than working collaboratively through the U.S. Environmental Protection Agency's ("EPA") Chesapeake Bay Program, which requires that sources of pollution be held accountable and that responsibility for improving the Bay's water quality be equitably allocated across the Bay's entire watershed. MDE faced the risk that EPA would allocate much of the responsibility for reducing pollution in the watershed to the State of Maryland, which in turn would have been required to regulate in-state polluters more stringently.

9. Exelon shares Marylanders' concerns that pollution is jeopardizing the health of the Chesapeake Bay, and Exelon will continue to partner with state and local governments to protect this essential ecosystem. But it is unreasonable for the State of Maryland to expect Exelon to shoulder the entire burden of removing excess nutrients and all trash at the end of a 464-mile river.

10. Exelon asks this Court to declare that the Certification's requirements exceed Maryland's authority under the Clean Water Act and violate the United States Constitution, and to order Defendants to withdraw the Certification and then promptly notify FERC of the withdrawal.

JURISDICTION AND VENUE

11. This is an action for declaratory and injunctive relief for violations of the Clean Water Act ("CWA"), 33 U.S.C. §§ 1251–1387, and the United States Constitution.

12. This Court has jurisdiction over Plaintiff's claims pursuant to 28 U.S.C. § 1331. This action and the remedies it seeks are further authorized by 28 U.S.C. §§ 1651, 2201, and 2202, and by Federal Rule of Civil Procedure 57.

13. Venue is proper under 28 U.S.C. § 1391(b)(2) because a state water-quality certification was formally requested on April 29, 2013, by FERC, located in the District of Columbia; the Certification was formally submitted on May 8, 2018, to FERC's Secretary, whose

office is located in the District of Columbia; and the Certification contains requirements that, absent judicial intervention, will become conditions on a federal license that FERC will issue in the District of Columbia.

PARTIES

A. Plaintiff

14. Plaintiff Exelon Generation Company, LLC ("Exelon") is a Pennsylvania limited liability company that generates and markets electricity in Maryland, the District of Columbia, and elsewhere.

15. Exelon is a fully owned subsidiary of Exelon Corporation, a Pennsylvania corporation with its headquarters in Chicago, Illinois.

B. Defendants

16. Defendant Benjamin H. Grumbles is Maryland's Secretary of the Environment and thus the head of MDE. Defendant Grumbles has responsibility for carrying out and enforcing the provisions of Maryland's Environment Code and the rules and regulations adopted under it, including Code of Maryland Regulations § 26.08.02.10, which governs the process for issuing certifications under CWA Section 401, 33 U.S.C. § 1341. Defendant Grumbles transmitted the Certification to FERC for incorporation in the Conowingo Project's federal license. Defendant Grumbles is being sued in his official capacity.

17. Defendant D. Lee Currey is the Director of MDE's Water and Science Administration. Defendant Currey exercises enforcement authority delegated to him by Maryland's Secretary of the Environment. He signed and issued the Certification. Defendant Currey is being sued in his official capacity.

FACTUAL BACKGROUND

A. The Conowingo Hydroelectric Project

18. Plaintiff Exelon owns and operates the Conowingo Project, a 573-megawatt hydroelectric power plant located on the lower Susquehanna River in Maryland.

19. The Susquehanna River flows for nearly 450 miles through New York and Pennsylvania and then through Maryland for about 15 miles before emptying into the Chesapeake Bay, North America's largest estuary. The Conowingo Project is located about ten miles upstream of where the Susquehanna River flows into the Chesapeake Bay.

20. The watershed for the Susquehanna River drains a land area of more than 27,000 square miles and includes over 40,000 miles of waterways in New York, Pennsylvania, and Maryland upstream of the Conowingo Project.

21. Since its construction in 1928, the Conowingo Project has provided multiple benefits to the Chesapeake Bay, surrounding communities, and the State of Maryland.

22. Though never required by law to perform a pollution-reduction function, the Conowingo Project historically has protected the water quality of the lower Susquehanna River and the Chesapeake Bay by trapping some of the nutrient pollution introduced into the River by upstream sources in Pennsylvania and New York, reducing its potential to reach the Bay. Without the Conowingo Project, these pollutants would have entered the Bay years ago.

23. EPA's Chesapeake Bay Program has recognized that "[t]rapping of pollutants by the Conowingo reservoir over the past 80+ years has benefited the water quality of the Bay" and has "benefited states by lessening [pollutant] load reduction responsibilities."

24. The pollutants at issue are generated upstream of the Project. The Project does not generate any nutrients (such as nitrogen or phosphorus).

25. As with any dam, however, the Project's trapping capacity has been declining for many decades, as sediment flowing downstream was deposited in the Conowingo Reservoir, reducing its depth.

26. The Conowingo Project also provides benefits to wildlife. It provides breeding, nesting, and foraging grounds for the American Bald Eagle and helps migratory and native fish travel over the dam for spawning in the Susquehanna River, using multimillion-dollar fish lifts.

27. For nearby residents as well as visitors, the Conowingo Project provides opportunities for educational programs and for recreation, including boating, hiking, fishing, and birdwatching. It provides 15 recreational facilities and public-access areas, including boat launches, marinas, and scenic overlooks.

28. The Conowingo Project generates approximately $273 million in annual economic benefits to Maryland and its local communities by supporting full-time jobs, driving tourism in northeastern Maryland, and contributing to local and state tax revenues.

29. The Conowingo Project is Maryland's largest source of renewable energy, producing more than 55% of Maryland's renewable energy. Compared to a coal facility of similar size, the Conowingo Project avoids the release of 6.5 million tons of greenhouse-gas emissions annually.

B. FERC Relicensing of the Conowingo Project

30. Exelon is seeking renewal by FERC of its operating license for the Conowingo Project for a term of 50 years.

31. Exelon is pursuing the relicensing using FERC's integrated licensing process, which involves consultation with regulatory agencies and stakeholders on various issues, including fish passage, water quality, shoreline management, and recreational conditions.

32. In support of the integrated licensing process, Exelon developed a study plan during the pre-application stage, in or about 2009.

33. Under that plan, Exelon performed more than 45 separate studies regarding various environmental issues, including fish passage, stream flow, the movement (transport) of sediment, and water temperature. Exelon also supported or cooperated with additional studies or evaluations by the United States Army Corps of Engineers (the "Army Corps") and EPA that extended beyond the Conowingo Project and more broadly concerned the Chesapeake Bay.

34. Exelon completed these studies in 2012.

35. On August 31, 2012, Exelon filed an application with FERC to renew its operating license for the Conowingo Project.

36. In 2015, FERC issued an Environmental Impact Statement ("EIS") for three hydroelectric projects on the lower Susquehanna River, including the Conowingo Project. FERC's EIS concluded that for dissolved oxygen, existing project operation generally does not exceed state water-quality standards. The EIS noted that the Susquehanna River is the largest source of freshwater to the Chesapeake Bay, contributing about 70% of the total nitrogen and 55% of the total phosphorus, and that the presence of these pollutants is a watershed-wide issue. The EIS stated that, if the reservoirs' capacity to store sediment and other pollutants was reduced, then "governmental jurisdictions in the watershed might need to increase their … nutrient-reduction efforts."

37. The EIS also considered whether dredging might be a reasonable way to increase the Conowingo Reservoir's trapping capacity. Citing the Lower Susquehanna River Watershed Assessment ("LSRWA"), a joint effort of the Army Corps and MDE, FERC's EIS reported "that

operational changes at Conowingo would not address the sediment transport issue, and that dredging of Conowingo [Reservoir] would be cost prohibitive and ineffective."

38. As part of the relicensing process, Exelon engaged in detailed negotiations with the United States Department of the Interior and entered into a settlement. Exelon committed to enhancing fish passage by trapping and transporting fish to reduce the time it takes them to reach spawning locations. As part of the settlement, Exelon will haul the fish not just to the Conowingo Reservoir, but further upstream past three additional dams to ensure that a high percentage of fish successfully complete their journey.

C. Section 401 of the Clean Water Act

39. As part of the relicensing process for federal hydroelectric facilities, applicants are required to seek a state certification under CWA Section 401. That statute provides States the opportunity to review requests by applicants for federal licenses and to certify whether the discharge associated with the activity being licensed will comply with specific CWA provisions. 33 U.S.C. § 1341(a)(1).

40. A State may grant a certification under this Section ("a 401 certification"), either with or without conditions, deny a certification, or waive its power to grant or deny. 33 U.S.C. § 1341(a)(1).

41. In providing a conditional 401 certification, a State may "set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure" that the applicant "will comply" with various limitations under designated CWA provisions, where applicable, "and with any other appropriate requirements of State law." 33 U.S.C. § 1341(d).

42. Limitations or requirements set forth in a conditional 401 certification "shall become a condition on [the applicant's] Federal license." 33 U.S.C. § 1341(d). FERC believes

that it lacks the authority to review the legality of State-imposed conditions and is required to incorporate them in the federal hydroelectric license, even if they are inconsistent with federal law.

D. Exelon's Application to MDE for 401 Certification

43. On January 31, 2014, Exelon submitted a request to MDE for a 401 certification in connection with the FERC relicensing of the Conowingo Project.

44. That application included copies of studies that had been completed as part of the FERC relicensing process.

45. In response to the application, MDE asked Exelon to conduct an additional study to understand the impacts of sediment transport on water quality in the Susquehanna River and the Chesapeake Bay (the "Sediment Study").

46. While Exelon believed its application was complete and that no additional study was required for MDE to issue a 401 certification for the Conowingo Project, in December 2014 Exelon entered into an agreement with MDE to work with Maryland agencies, the Army Corps, the U.S. Geological Survey, the University of Maryland Center for Environmental Science, and EPA to design and conduct a multi-year Sediment Study, to provide additional information to MDE.

47. Exelon paid $3.5 million to fund the Sediment Study.

48. States must act on applications for 401 certifications within one year, but the Sediment Study would not be completed within that time. On December 4, 2014, cognizant of MDE's desire for additional study, Exelon provided MDE with more time by withdrawing its application for a 401 certification and then timely refiling.

49. Exelon refiled its application for a 401 certification on March 3, 2015, and withdrew that application on February 5, 2016, pending conclusion of the Sediment Study.

50. Exelon again refiled its application on April 25, 2016, and withdrew that application on February 17, 2017.

51. Each time Exelon withdrew and refiled its application, it did so to cooperate with MDE's stated desire for more time to study the 401 certification request.

52. On March 13, 2017, MDE indicated that it expected to receive Exelon's resubmission no later than May 18, 2017, and would, upon receiving the resubmission, initiate its review of the water-quality impacts associated with the Conowingo Project.

53. On May 17, 2017, Exelon submitted another request to MDE for a 401 certification in connection with the relicensing of the Conowingo Project.

54. The studies that Exelon submitted to MDE as part of its request and the information in the record before MDE demonstrate that the Conowingo Project is not the source of pollution entering the Susquehanna River. They also demonstrate that the Project is meeting all applicable state water-quality standards in waters immediately downstream.

55. The Sediment Study confirmed that Conowingo Project operations introduce negligible amounts of sediment into the water, solely from natural causes, and do not cause downstream water-quality violations that may result from sediment transport.

56. Similarly, the Water Quality Study shows that the average dissolved-oxygen ("DO") conditions within all of the turbine boils are always at or above standards, that DO standards in the tailrace (where water from the turbines is discharged) are met, that DO standards are being met immediately downstream of the Project, that minimum and maximum turbidity values recorded downstream are within state water-quality standards, and that operation of the Conowingo Project has no measurable effect on the temperature of the water being released downstream.

57. Likewise, the aquatic-resources studies show that the Conowingo Project is not adversely impacting fish propagation and instead supports a diverse assemblage of fish and a healthy multi-species sport fishery supported by natural reproduction.

E. MDE's Issuance of the 401 Certification

58. On April 27, 2018, MDE issued the Certification to Exelon pursuant to CWA Section 401; Title 9, Subtitle 3 of the Maryland Code, Environment Article; and Section 26.08.02 of the Code of Maryland Regulations.

59. The Certification states that it is a final decision.

60. Defendants published the Certification in the *Maryland Register* on May 11, 2018.

61. In a departure from the State's previous 401 certifications and previous recognition by the State and others of the Conowingo Project's benefits to the Bay, the Certification asserts that "the Project adversely impacts water quality in the State of Maryland."

62. The Certification imposes conditions that require Exelon to address impacts on the Susquehanna River that are caused by upstream polluters and are unrelated to the activities of the Conowingo Project.

63. The Certification contains conditions regarding dissolved oxygen that, among other things, require Exelon to undertake Required Nutrient Reductions that would annually reduce the amount of nitrogen and phosphorus in the Project's discharges by 6,000,000 pounds and 260,000 pounds, respectively. (High levels of nutrients such as nitrogen and phosphorus can cause low levels of dissolved oxygen.)

64. The Certification provides no authority for requiring Exelon to remove nutrients from the Susquehanna River rather than imposing future nutrient reductions on the sources of those nutrients.

65. Nor does the Certification identify any effective or reasonable means to achieve this massive nutrient removal at the Conowingo Project, which is downstream from the sources of these pollutants.

66. Instead, MDE seeks payment from Exelon in excess of $172 million annually, the installation of best management practices and/or ecosystem restoration activities, and/or dredging of the Conowingo Reservoir. None of these purported nutrient-reduction methods actually addresses the sources of the pollution.

67. Section 7.D.iv of the Certification provides that Exelon "shall provide to MDE for review and approval, no later than December 31, 2019, a nutrient corrective action plan (the 'NCAP') for achieving the Required Nutrient Reductions and otherwise ensuring that DO [dissolved oxygen] levels in the DO Non-Attainment Area [two segments in the central Chesapeake Bay] are not adversely impacted by Project operations and discharges."

68. Section 7.D.iv further provides that Exelon's "NCAP may propose any combination of corrective action strategies," including: (1) "[d]redging the Reservoir," *id.* § 7.D.iv.c; (2) "[i]nstallation of best management practices and/or ecosystem restoration actions," *id.* § 7.D.iv.b; or (3) "[p]ayment of an in-lieu fee" prescribed by MDE, *id.* § 7.D.iv.a.

69. None of these conditions is related to Exelon's own activities. Instead, the conditions all relate to the abatement of pollution introduced into the Susquehanna River by others.

70. Moreover, neither dredging nor the installation of "best management practices" or "ecosystem restoration actions" is a workable method for attaining the Bay's dissolved-oxygen standards. Thus, the in-lieu fee is the Certification's dominant condition.

71. The Section 7.D.iv conditions present only an illusion of genuine "options" for Exelon. On information and belief, the conditions were designed to leave Exelon with no choice but to pay Maryland a massive annual fee.

1. Dredging the Conowingo Reservoir

72. As Maryland itself has conceded (in a report that MDE co-authored with the Army Corps), dredging is an impractical solution whose high costs cannot be justified by water-quality benefits that would likely be both minimal and short-lived. Dredging and disposing of this much sediment is not feasible, and would itself cause environmental harm. For numerous reasons, dredging the reservoir is not a realistic option.

73. It is impossible at this time to precisely project the full costs of dredging the Conowingo Reservoir. But the MDE/Army Corps LSRWA study estimated that the cost of a limited dredging program could total as much as $2.8 billion. And based on the projected costs of a pilot dredging program proposed by Maryland (which has yet to obtain regulatory approval or commence), it appears that dredging to merely maintain the Reservoir's current depth could cost more than $900 million per year.

74. As MDE and the Army Corps noted, those costs are likely to increase over time as convenient sites for disposing of the dredged sediment become scarcer.

75. Dredging would also significantly diminish the community's enjoyment of the fisheries and other recreational activities at Conowingo Reservoir.

76. Any ecosystem benefits from dredging would be short-lived. With the Susquehanna River's 27,000-square-mile watershed, significant and continuous sediment deposition is unavoidable. According to MDE and the Army Corps, a dredging program would be

hard-pressed even to "keep[] up" with new deposition, much less to return the Reservoir to twentieth-century conditions.

77. According to the MDE/Army Corps report, dredging would have little beneficial effect on the environment because it would result in only "minor" improvements in ecosystem conditions and would have little effect on water-quality conditions in the Chesapeake Bay.

78. In its EIS, FERC credited the MDE/Army Corps report's findings that "dredging of Conowingo [Reservoir] would be cost prohibitive and ineffective" and concluded that there was "no justification at this time for requiring Exelon to implement measures such as dredging to help control sediment and nutrient loading in the Bay, which would occur in the long term whether or not Conowingo Dam was in place."

79. State-imposed dredging would require Exelon to remove pollutants introduced into the Susquehanna River not by Exelon, but by polluters in New York and Pennsylvania.

2. Best Management Practices and/or Ecosystem-Restoration Actions

80. Generally, Exelon embraces best management practices for the Project lands that Exelon owns. But the Project lands cover a miniscule portion of the Susquehanna River basin, so these practices are insignificant compared with the Certification's massive Required Nutrient Reductions.

81. The Certification does not identify "best management practices" or "ecosystem restoration actions" that could potentially achieve the targeted level of nutrient reductions.

3. In-Lieu Fees

82. Under Section 7.D.iv.a of the Certification, Exelon's NCAP may propose "payment of an in-lieu fee annually at $17.00 per pound of nitrogen and $270.00 per pound of phosphorus in accordance with payment instructions provided by MDE from time to time" and subject to adjustments for inflation.

83. This condition would result in annual payments from Exelon to MDE of more than $172 million, totaling more than $7 billion over the term of the license — or roughly a half-million dollars ***per day*** for 40-plus years.

84. In-lieu fees under the Certification will automatically escalate with inflation and may be further increased under the Certification's reopener provisions, which purport to allow MDE to amend the Certification conditions at any time.

85. The Certification does not identify or constrain how Maryland will spend this money.

86. On information and belief, even aggressive pollution-control and pollution-reduction efforts focused solely on the Conowingo Project and other parts of the Susquehanna River watershed that fall within the confines of Maryland would be insufficient to cure the identified dissolved-oxygen problem in the Bay.

87. The Certification's conditions are unprecedented. On information and belief, Maryland's Certification for the Conowingo Project is the first Section 401 water-quality certification for a FERC-licensed hydroelectric project, anywhere in the Nation, that has been conditioned on the licensee's removal of pollution not caused by the project's operations. On information and belief, the Certification also is the first Section 401 water-quality certification for

a FERC-licensed hydroelectric project, anywhere in the Nation, that has been conditioned on the licensee's payment to a State of an annual multimillion-dollar "fee" in lieu of such removal.

88. Ordinarily, Section 401 certifications for hydroelectric projects set threshold quantities for compliance (for example, for dissolved-oxygen levels in the dam's tailrace), require the licensee to monitor for quantities inconsistent with that threshold and, if monitoring reveals such quantities, require the licensee to undertake measures to bring the quantities back in line with that threshold.

89. Maryland's Certification for the Conowingo Project departs dramatically from this approach by functionally requiring Exelon to pay the State tens or hundreds of millions of dollars every year for 40-plus years for an unspecified purpose.

4. Other Conditions

90. Section 7.F of the Certification contains conditions requiring the Conowingo Project to remove, at least 40 times per year, "all" trash and debris that flows down the River into the Project.

91. Section 7.B of the Certification contains fish-passage conditions that exceed the requirements established in Exelon's settlement with the Department of the Interior, without citing any evidence that the additional measures are needed. And some of the Certification's conditions will actually make it easier for invasive species to migrate upstream through the Conowingo Project.

92. Sections 2.C and 7 of the Certification also contain other conditions that provide for planning, additional studies, reopening, and modification by MDE and would allow MDE to impose as-yet-unknown additional requirements on the Conowingo Project.

F. FERC's Imminent Incorporation of the Certification's Conditions into Exelon's Operating License

93. The Certification states that "[t]his is a final decision on [Exelon's] Application" and that "[a]ny request for an appeal does not stay the effectiveness of this Certification."

94. On May 8, 2018, MDE submitted the Certification to FERC by filing it in the docket for the Conowingo Project's license renewal.

95. Under CWA Section 401(d), the conditions of a 401 certification "shall become a condition on any Federal license" to which the certification pertains. 33 U.S.C. § 1341(d).

96. Because MDE has labeled the Certification a "final decision," has submitted the Certification to FERC, and has stated that it will not stay the Certification's effectiveness during any appeals, FERC could incorporate the Certification's conditions into the Conowingo Project's license at any time under CWA Section 401(d).

97. MDE's issuance of the Certification and its submittal to FERC cause immediate harm to Exelon. Exelon will be subject to obligations that exceed Maryland's authority under the Clean Water Act and violate the United States Constitution.

98. Exelon is directly regulated by Defendants' actions and risks penalties if it fails to comply.

G. The Chesapeake Bay TMDL

99. Maryland has unilaterally placed these obligations on Exelon despite the existence of a comprehensive federal regulatory scheme for water quality in the Chesapeake Bay and its tidal tributaries.

100. The CWA establishes distinct roles for the federal and state governments in addressing water quality in waters of the United States. For the Bay, these federal and state roles have been implemented through EPA's Chesapeake Bay Program, pursuant to CWA Section 117.

33 U.S.C. § 1267. The Chesapeake Bay Program was established as a regional partnership in 1983 to protect and restore the Bay's ecosystem by, among other things, identifying impaired waters, identifying sources of pollutants that cause the impairments, and developing specific plans for reducing pollutants.

101. To achieve these goals, in CWA Section 117(g)(1), Congress directed the Administrator of the United States Environmental Protection Agency (the "Administrator" or "EPA") to "ensure" that States in the Chesapeake Bay watershed develop management plans and begin implementation "to achieve and maintain … (A) … nutrient goals … for the quantity of nitrogen and phosphorus entering the Chesapeake Bay and its watershed" and "(B) the water quality requirements necessary to restore living resources in the Chesapeake Bay ecosystem." 33 U.S.C. § 1267(g)(1)(A)-(B).

102. The Chesapeake Bay watershed spans seven jurisdictions: Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia (the "Bay Jurisdictions" or "the States").

103. The States recognized that water pollution in the Bay is a "tragedy of the commons." Because the Bay is affected by so many sources of pollution throughout its watershed, no single State has sufficient incentive to reduce pollutant loads from its own sources unless it believes that other States will do likewise.

104. For each waterway in each State, CWA Section 303 requires the State to develop and periodically update "water quality standards." 33 U.S.C. § 1313(c)(2)(A). But the standards can take effect only if EPA approves them. *Id.* § 1313(c)(2)(A), 1313(c)(3)-(4).

105. For any waters that do not meet applicable water-quality standards, the State may establish a "total maximum daily load" ("TMDL") for each relevant pollutant, at a level necessary

to satisfy the applicable water-quality standards. 33 U.S.C. § 1313(d)(1)(C). A TMDL is essentially a "pollution diet" designed to identify necessary reductions of pollutant loads so that a waterway can meet the applicable water-quality standards.

106. However, these State-established "loads" cannot take effect unless they are approved by EPA. 33 U.S.C. § 1313(d)(2). If new facts come to light or new scientific methods are developed that indicate that a previously calculated "load" for a particular pollutant in a particular waterway will no longer result in attainment of applicable water-quality standards, the "load" must be amended as necessary to satisfy the water-quality standards. As with the initial load allocation, a load reallocation must be approved by EPA. *Id.* § 1313(d)(2).

107. EPA exercised its authority under CWA Section 303(d)(2) to establish a comprehensive federal TMDL for the entire Bay watershed that, unique among TMDLs, imposed pollutant reductions on the Bay jurisdictions, including the State of Maryland. Each State in turn had to find ways to secure reductions at the sources of pollution within that State.

108. Following formal public notice and comment, EPA established the Bay TMDL for the Chesapeake Bay on December 29, 2010 (the "Bay TMDL"). In the Bay TMDL, EPA established a comprehensive "pollution diet" to restore the health of the Bay and the waterways that feed it.

H. The Chesapeake Bay TMDL's Pollution Allocations

109. To calculate pollutant loads, EPA used then-available data and complex computer models that described hydrologic and water-quality processes, estimated the load of each pollutant to each water body, and predicted how the load would change as various remediation methods are implemented. EPA acknowledged in the 2010 Bay TMDL that its "models produce estimates, not perfect forecasts"; that improving data and modeling methods could necessitate "[c]hanging

modeling numbers"; that EPA's models would "be updated continuously according [to] the state of the art of modeling technology"; and that EPA therefore would, over the years, "modify the TMDL" and "adjust[] … the allocations" if necessary based on updates to the models.

110. In 2010, EPA calculated that, to reach its goals for the Bay's water quality by 2025, significant nutrient reductions of discharges of nitrogen and phosphorus would be required. EPA allocated those total amounts with some specificity. For each of the 92 segments of the Chesapeake Bay watershed, EPA calculated the reductions in nitrogen, phosphorus, and sediment loads, or "allocations," that specific point sources of pollution (such as a factory) and nonpoint-source sectors (such as agriculture) would have to undertake, so that the Bay would satisfy all applicable water-quality standards by 2025. Each segment is located in one and only one of the seven Bay jurisdictions and in one and only one of the eight major river basins (Susquehanna, Potomac, James, Rappahannock, York, Patuxent, Eastern Shore, or Western Shore).

111. The Bay TMDL does not hold any discharger singularly responsible for restoring the Bay, but instead distributes the obligations to prevent pollution among the seven Bay jurisdictions.

112. In turn, the States became obligated to implement the Bay TMDL through a series of phased-in Watershed Implementation Plans ("WIPs"). WIPs are mandatory, detailed planning documents that each Bay jurisdiction must develop, subject to EPA approval, under CWA Section 303(e). 33 U.S.C. § 1313(e). WIPs identify specific programs to require or encourage polluters to control pollution at its source, ranging from tax incentives to grants to new state regulations and local land-use ordinances.

113. The Bay TMDL spans 15 years, from 2010 to 2025, when each segment of the Bay is to attain its goals under the States' EPA-approved water-quality standards. There are numerous

checkpoints over that period. First, the Bay TMDL requires that States create three WIPs over the life of the project. States submitted Phase I WIPs to EPA in 2010 and updated, more-detailed Phase II WIPs to EPA in 2012. These WIPs described actions and controls to be implemented by 2017 and 2025. States will submit Phase III WIPs to EPA to provide updated, more-detailed information on actions the States will take through 2025. Second, States are required to follow biennial milestones, which began in 2012, to track progress and evaluate the effectiveness of the WIPs. EPA reviews the milestones and assesses whether they have been met and whether they are sufficient to achieve pollution reduction. Third, EPA set a goal of achieving at least 60% of all pollutant reductions for the 15-year timeframe by 2017, roughly the midpoint between 2010 and 2025.

114. EPA made clear that revisions to the TMDL's allocations could be proposed by a State, but could be approved only by EPA: "[I]t might be appropriate for EPA to revise the Bay TMDL (or portions of it). EPA would consider a request by the jurisdictions to propose such a revision to the TMDL following appropriate notice and comment. Alternatively, a jurisdiction could propose to revise a portion(s) of the Bay TMDL that applies within its boundaries (including, but not limited to specific [allocations]) and submit those revisions to EPA for approval."

I. The Conowingo Project and the Chesapeake Bay TMDL

115. The 2010 Bay TMDL recognized that the Conowingo Project had long kept some pollutants from flowing into the Chesapeake Bay but would eventually fill in under a natural deposition process and thereafter would have diminished ability to serve this protective role.

116. For purposes of the 2010 Bay TMDL, EPA assumed that the Conowingo Project would maintain trapping capacity through 2025. But EPA provided a contingency plan: "If future monitoring shows the trapping capacity of the dam is reduced, then EPA would consider adjusting

the Pennsylvania, Maryland, and New York 2-year milestone loads." These potential adjustments, EPA explained, would "ensure that each jurisdiction is meeting its obligations."

117. In the years immediately following adoption of the 2010 Bay TMDL, the Chesapeake Bay Program came to believe that the Conowingo Project had already reached "dynamic equilibrium," which means that, over a long period (such as a decade), the amount of pollutants flowing toward the dam from the north and the amount flowing away from the dam to the south would be roughly equal. As a consequence, the dam had effectively lost its long-term trapping capacity, although it continues to provide environmental benefits related to sediment and nutrients.

118. When preparing for the Bay TMDL's 2017 Midpoint Assessment, EPA learned that upgraded computer models and better data (relating to both the Conowingo Project and many other issues, such as the impacts of economic growth and climate change) showed that the 2010 projections had been overly optimistic. The nutrient reductions that EPA had established in 2010 would need to be increased by at least two or three percent. If the 2010 Bay TMDL allocations for nitrogen and phosphorus were not amended, dissolved-oxygen levels in parts of the Bay would not satisfy applicable water-quality standards by 2025.

119. Using the upgraded computer models and better data, potential allocations were recalculated. Two of the options considered were (1) concentrating the burden of reallocation (for both nitrogen and phosphorus) solely in the Susquehanna River watershed and (2) spreading that burden across the entire Chesapeake Bay watershed.

120. Under the first option, new calculations showed that the shortfall could be compensated for by reducing nutrient loads in the Susquehanna River by about 6,000,000 pounds of nitrogen and about 260,000 pounds of phosphorus per year — ***precisely the reduction allocated***

to Exelon in MDE's 401 Certification. Because only a small fraction of the Susquehanna River's length and only a small fraction of the sources that pollute the River are located in Maryland, this approach would require Maryland sources of pollution to reduce their loads by only about 120,000 pounds of nitrogen and about 5,000 pounds of phosphorus per year. The rest of the reductions would come from pollution sources in Pennsylvania and New York.

121. By contrast, under the second option, if the shortfall were compensated for by reducing nutrient loads across the entire Chesapeake Bay watershed, rather than just in the Susquehanna River watershed, Maryland would be forced to go on a much stricter "pollution diet." That is because Maryland represents a much smaller fraction of the Susquehanna River watershed than of the total Chesapeake Bay watershed.

122. Spreading the burden across the entire Bay watershed, rather than concentrating it in the Susquehanna River watershed, would increase the burden on Maryland more than 14-fold for nitrogen and about 18-fold for phosphorus.

123. As the Chesapeake Bay TMDL is a federal TMDL, all revisions to the Bay TMDL loads must be approved by EPA. MDE has no authority to make decisions regarding allocations among States or among watersheds.

124. Neither Maryland nor any of the other Bay jurisdictions formally asked EPA to modify the 2010 Bay TMDL's allocations to adjust for the shortfall. And to date, EPA has not approved any revisions to the 2010 Bay TMDL's allocations based on the new calculation of needed reductions in the amounts of nitrogen and phosphorus.

125. Instead of asking EPA to reallocate nutrient reductions and run the risk of taking on additional burdensome obligations, MDE has now essentially "self-reallocated" the additional 6,000,000 pounds of nitrogen and 260,000 pounds of phosphorus to the tiny portion of the

Susquehanna River basin located in Maryland, where the Conowingo Project is located, and then placed the burden on Exelon to remove those pollutants.

126. On information and belief, the Certification presented a convenient opportunity to shift the burden of pollution reduction from the States onto a private entity. The Conowingo Project, located in Maryland, was up for relicensing by FERC, so the Project's owner and operator, Exelon, needed to obtain a Section 401 certification from Maryland as a prerequisite to federal relicensing. The Certification uses this opportunity to impose billions of dollars of fees on Exelon.

127. Instead of awaiting EPA's determination on amended allocations for nitrogen and phosphorus and running the risk that Maryland would have to shoulder its fair share of the obligation for protecting the Bay, Maryland is now attempting to saddle Exelon with responsibility for the entire annual shortfall of 6-plus million pounds of pollutants, by making those reductions an express condition of Maryland's Section 401 certification.

CLAIMS FOR RELIEF

COUNT ONE:
VIOLATION OF SECTIONS 117, 303, AND 401 OF THE CLEAN WATER ACT

128. Plaintiff repeats and incorporates by reference every allegation in the preceding paragraphs.

129. Section 401 of the CWA provides that a State may grant a water-quality certification with limitations or requirements, which will become conditions on the federal license. 33 U.S.C. § 1341(d). The CWA authorizes States to impose only those conditions that are "necessary" to assure that the applicant for a federal license will comply with certain CWA requirements and with any other appropriate requirement of state law. *Id.* § 1341(d). Among the

CWA provisions that States consider when deciding whether to grant a 401 certification (or to grant it with conditions) is CWA Section 303, which governs TMDLs.

130. Under Sections 117 and 303 of the CWA, 33 U.S.C. §§ 1267, 1313, EPA in 2010 established the Chesapeake Bay TMDL, which set express limits for the amount of nitrogen and phosphorus flowing into the Bay, with the goal of restoring the Bay's water quality by 2025. EPA allocated these limits by type of pollution source within each jurisdiction and major river basin.

131. Having been set by EPA, the 2010 Bay TMDL allocations could lawfully be changed, and any new reductions allocated, only by EPA. EPA has not made any such changes. MDE's conducting a reallocation outside the federal TMDL process is both unnecessary and unlawful.

132. MDE's Certification claims (or assumes) that the nitrogen- and phosphorus-related conditions imposed on Exelon are ***necessary*** to assure that Exelon will comply with Maryland water-quality standards that mandate certain dissolved-oxygen levels in the Chesapeake Bay. That is incorrect.

133. Attainment of the dissolved-oxygen standards in the Bay does not require that Exelon reduce nitrogen and phosphorus loads in the Susquehanna River at the Conowingo Project. Rather, reductions sufficient to attain those standards can be lawfully achieved only by EPA revising the 2010 Bay TMDL's allocations for nitrogen and phosphorus and by requiring the actual sources of the pollution to limit their discharges.

134. Formal public notice and comment is required for such revisions.

135. Under the CWA, it is the role of EPA — not of any one State — to determine which Bay jurisdictions, which major river basins, and which types of pollution sources should bear the burden of reducing nitrogen and phosphorus loads.

136. By unilaterally reallocating the nitrogen and phosphorus loads established in the 2010 Bay TMDL, Defendants have usurped the authority that Congress delegated to the Administrator of the United States Environmental Protection Agency and have violated Sections 117, 303, and 401 of the Clean Water Act.

COUNT TWO:
VIOLATION OF SECTION 401 OF THE CLEAN WATER ACT

137. Plaintiff repeats and incorporates by reference every allegation in the preceding paragraphs.

138. MDE's authority to issue a 401 certification and to impose conditions through that certification is derived from the Clean Water Act.

139. The Certification violates Section 401 in several distinct respects.

140. First, the Clean Water Act limits the introduction of pollutants into the navigable waters. It does not demand the removal of pollutants from the navigable waters. The Clean Water Act is a pollution-control statute, not a pollution-cleanup statute. In enacting other environmental statutes, Congress has exercised its authority to require regulated parties to remove pollutants (or pay for the removal of pollutants) from navigable waters in circumstances not pertinent here — but it has not done so under Section 401 of the Clean Water Act.

141. The Clean Water Act does not hold dam operators liable for cleaning up or removing pollutants that were added by upstream sources. And CWA Section 401 does not authorize the State of Maryland to require Exelon to remove pollutants from the Susquehanna River.

142. Second, CWA Section 401 addresses activities involving a point source that may result in a discharge to navigable waters. Section 401 does not govern nonpoint-source pollution. Yet Maryland has purported to impose obligations on Exelon under Section 401 to clean up

pollution deposited in the Susquehanna River by nonpoint sources upstream of the Conowingo Project.

143. Third, the "discharge" into navigable waters that States may regulate under Section 401 is defined to include "discharge of a pollutant" or pollutants, 33 U.S.C. § 1362(16), which is itself defined to mean "any ***addition*** of any pollutant to navigable waters," *id.* § 1362(12) (emphasis added). Thus, while a State may impose conditions under Section 401 relating to attributes of a licensee's discharge that do not relate to pollutants (such as water flow), a State's authority to regulate a pollutant under Section 401 arises only if the pollutant is contained in a "discharge of a pollutant," as defined by the statute. Here, the passage of nitrogen and phosphorus through the dam is not a "discharge of a pollutant" because Exelon is not adding any pollutant to the Susquehanna River. So MDE cannot impose conditions under Section 401 that purport to regulate Exelon's discharge of such pollutants.

144. Fourth, under Section 401(d), the only conditions that a State may impose through a 401 certification are those "necessary" to assure that the applicant will comply with "effluent limitations and other limitations, and monitoring requirements necessary to assure" that the applicant "will comply with any [1] applicable effluent limitations and other limitations, under [CWA Section 301 or 302], [2] standard or performance under [CWA Section 306], or [3] prohibition, effluent standard, or pretreatment standard under [CWA Section 307], and with any [4] other appropriate requirement of State law." 33 U.S.C. § 1341(d).

145. The Certification's conditions are not necessary to assure that Exelon's operation of the Conowingo Project will comply with the provisions of the CWA that are designated in Section 401(d).

a. There are no effluent limitations or other limitations under CWA Section 301 that apply to the Conowingo Project.

b. There are no effluent limitations or other limitations under CWA Section 302 that apply to the Conowingo Project.

c. There are no standards of performance under CWA Section 306 that apply to the Conowingo Project.

d. There are no prohibitions, effluent standards, or pretreatment standards under CWA Section 307 that apply to the Conowingo Project.

146. Fifth, in determining whether a condition is necessary to assure that an applicant for a federal license will comply with an "appropriate requirement of State law," 33 U.S.C. § 1341(d), the State's authority is bounded by the scope and nature of the "activity" for which the applicant is seeking the federal license, *id.* § 1341(a)(1). There must be an adequate nexus between the condition and the applicant's activity.

147. The nutrients and trash that move downstream to the Project and the presence of invasive species are not the result of Exelon's activity.

148. The Certification's Section 7.D conditions violate Section 401 by making Exelon responsible for pollution that is generated by the activities of other parties in Pennsylvania and New York and not by Exelon's activity.

149. The Certification's Section 7.D conditions violate Section 401 by providing for ongoing review and approval at the whim of MDE.

150. Accordingly, the Certification's conditions exceed the scope of Maryland's authority under Section 401 of the Clean Water Act.

COUNT THREE:
VIOLATION OF THE SUPREMACY CLAUSE
OF THE UNITED STATES CONSTITUTION
(CONFLICT PREEMPTION)

151. Plaintiff repeats and incorporates by reference every allegation in the preceding paragraphs.

152. Under the Supremacy Clause of the United States Constitution, a state action is preempted when it stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress. U.S. Const. art. VI, cl. 2.

153. The CWA authorized EPA to establish a watershed-wide federal Chesapeake Bay TMDL that sets overall limits on the amount of nitrogen and phosphorus in the Chesapeake Bay watershed, to meet applicable water-quality standards. 33 U.S.C. §§ 1257, 1313. EPA has exclusive authority to allocate among the seven jurisdictions in the Chesapeake Bay watershed and among the watershed's eight major river basins the amount of nitrogen and phosphorus that each jurisdiction and basin may contribute to the Bay.

154. Maryland's issuance of the Certification was a state action.

155. Section 7.d.ii of Maryland's Certification stands as an obstacle to EPA's exclusive authority to allocate the amount of nitrogen and phosphorus that may flow into the Chesapeake Bay from each of the seven jurisdictions and eight major river basins.

156. Through Section 7.d.ii of the Certification, the State of Maryland allocates to Exelon responsibility for all additional reductions of nitrogen and phosphorus flowing into the Chesapeake Bay.

157. Maryland's Certification is preempted by the Supremacy Clause because it invades EPA's exclusive authority to allocate pollutant loads among the seven jurisdictions and eight major river basins in the Chesapeake Bay watershed, and interferes with EPA's exercise of that authority.

COUNT FOUR:
VIOLATION OF THE FIFTH AND FOURTEENTH AMENDMENTS TO THE UNITED STATES CONSTITUTION
(REGULATORY TAKINGS)

158. Plaintiff repeats and incorporates by reference every allegation in the preceding paragraphs.

159. The Takings Clause of the Fifth Amendment to the United States Constitution, incorporated to the States under the Fourteenth Amendment, provides that private property shall not be taken for public use without just compensation. U.S. Const. amends. V, XIV.

160. As its owner, Exelon has a vested property interest in the Conowingo Project.

161. In issuing the Certification, MDE has acted under color of state law to condition Exelon's operation of the Conowingo Project.

162. The Certification's conditions have deprived Exelon of all economically viable use of the Conowingo Project by imposing on Exelon alone a minimum fee of more than $172 million annually, or more than $7 billion over the license term, to remediate pollution in the Susquehanna River that originates from sources spread across much of Pennsylvania and New York.

163. For the first time in the Conowingo Project's 90 years of operation, the Certification's conditions have interfered with its owner's distinct investment-backed expectations by making Exelon retroactively liable for pollution in the Susquehanna River long-known by MDE to be caused by upstream polluters.

164. The Certification's conditions single out Exelon to bear the substantial economic burden of removing upstream pollutants unrelated to the Conowingo Project's activities and are thus a *sui generis* regulation of a hydroelectric project by a State.

165. Through the Certification's conditions, Maryland has taken the Conowingo Project from Exelon to serve Maryland's public interest in reducing upstream pollution caused by out-of-state polluters in a public waterway.

166. Maryland has not compensated Exelon for appropriating the Conowingo Project for this public use. Nor can Exelon obtain compensation from the State of Maryland for the economic effects that the Certification's conditions are having and will continue to have on the Conowingo Project.

167. As a consequence, MDE's issuance of the Certification has effected a regulatory taking of the Conowingo Project, Exelon's private property, for public use without just compensation, in violation of the Fifth and Fourteenth Amendments to the United States Constitution.

COUNT FIVE:
VIOLATION OF THE FOURTEENTH AMENDMENT
TO THE UNITED STATES CONSTITUTION
(SUBSTANTIVE DUE PROCESS)

168. Plaintiff repeats and incorporates by reference every allegation in the preceding paragraphs.

169. The Due Process Clause of the Fourteenth Amendment provides protection from economically burdensome regulations that are arbitrary and irrational. U.S. Const. amend. XIV.

170. In issuing the Certification's conditions, MDE has acted under color of state law.

171. The Certification's conditions serve no legitimate governmental objective because although their purported aim is to reduce pollution in the Chesapeake Bay, none of the methods they propose for doing so regulate upstream polluters, the true sources of the pollution.

172. The Certification's conditions also serve no legitimate governmental objective because none of the methods they propose is sufficiently tethered to nutrient reduction to meaningfully improve the dissolved-oxygen levels in the Bay.

173. The Certification's conditions propose that Exelon pay Maryland an annual multi-million-dollar "in-lieu" fee, but the fee is for no stated purpose — nutrient reduction or otherwise.

174. The Certification's conditions propose that Exelon dredge the Conowingo Reservoir even though MDE itself, along with the Army Corps, has concluded that dredging would be cost prohibitive and ineffective in controlling nutrient loading in the Chesapeake Bay.

175. The Certification's conditions propose that Exelon adopt "best management practices and/or ecosystem restoration actions" to address pollution in the Susquehanna River that is caused by countless upstream polluters that are neither known to nor under the control of Exelon.

176. Accordingly, by requiring Exelon to undertake costly actions that are unrelated to Exelon's own activities and that cannot serve MDE's stated governmental objectives, MDE has acted so arbitrarily and irrationally as to deprive Exelon of substantive due process in violation of the Fourteenth Amendment to the United States Constitution.

COUNT SIX:
VIOLATION OF THE SUPREMACY CLAUSE
OF THE UNITED STATES CONSTITUTION
(DISCRIMINATION AGAINST FEDERALLY LICENSED DAMS)

177. Plaintiff repeats and incorporates by reference every allegation in the preceding paragraphs.

178. Under the Supremacy Clause of the United States Constitution, States are not permitted to discriminate against the Federal Government or private entities with whom the Federal Government deals. U.S. Const. art. VI, cl. 2.

179. As the owner and operator of the Conowingo Project, Exelon is a licensee of the Federal Government.

180. Maryland discriminated against Exelon because it imposed stricter conditions related to water-quality standards on Exelon at the Conowingo Dam than it imposes on State-licensed dams. Maryland therefore treats these dams preferentially to the federal licensee.

181. Maryland has never required a State-licensed dam to remove an amount of nitrogen from the dam's discharges.

182. Maryland has never required a State-licensed dam to remove an amount of phosphorus from the dam's discharges.

183. Maryland has never required a State-licensed dam to pay a fee to the State in lieu of removing pollutants such as nitrogen or phosphorus from the dam's discharges.

184. Maryland has never required a State-licensed dam to remediate the impacts of nitrogen or phosphorus that was introduced into a waterway by upstream polluters before the licensee's discharges originated.

185. Maryland discriminated against Exelon because it did not follow the CWA Section 303 TMDL process to allocate pollutants in the Certification for the Conowingo Project but routinely follows the CWA Section 303 TMDL process to allocate pollutants for State-licensed dams.

186. CWA Section 401 does not authorize Maryland to discriminate against federal licensees in enforcing state water-quality standards.

187. Therefore, the Certification's conditions violate the Supremacy Clause of the United States Constitution.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully asks that this Court:

a. Declare that Defendants' Certification of Plaintiff's Conowingo Hydroelectric Project includes requirements that exceed the State of Maryland's authority under the Clean Water Act and violate the United States Constitution;

b. Order Defendants to withdraw their Certification of Plaintiff's Conowingo Hydroelectric Project;

c. Order Defendants promptly to notify the Federal Energy Regulatory Commission of this withdrawal;

d. Award attorneys' fees and costs pursuant to 42 U.S.C. § 1988; and

e. Grant such other and further relief as may be just and proper.

May 25, 2018

Respectfully submitted,

By: /s/ David W. DeBruin

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HERBERT M. SACHS
DIRECTOR

STATE OF MARYLAND
DEPARTMENT OF NATURAL RESOURCES
WATER RESOURCES ADMINISTRATION
TAWES STATE OFFICE BUILDING
ANNAPOLIS, MARYLAND 21401

February 7, 1975

Mr. J. L. Allen
Assistant Chief Mechanical Engineer
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Allen:

On July 19, 1974, you requested a certification, pursuant to Section 401(a)1 of the Federal Water Pollution Control Act of 1972, 33 U.S.C. Sections 1151 et. seq., for the Conowingo Hydroelectric Power Plant, located at Conowingo, Maryland.

The State of Maryland hereby certifies that:

1. The Administrator of the Environmental Protection Agency has not defined best practical control technology currently available for discharges from hydroelectric power generating stations, pursuant to Section 301, and has not established effluent limitations applicable to the Conowingo Hydroelectric plant pursuant to Section 302.

2. The Administrator of the Environmental Protection Agency has not published standards of performance applicable to hydroelectric power-plants pursuant to Section 306.

3. The Administrator of the Environmental Protection Agency has not promulgated a list of toxic and pre-treatment effluent standards applicable to hydroelectric powerplants pursuant to Section 307 of the Act.

4. The State of Maryland, pursuant to Section 402 of the Act, was delegated the operation of the NPDES permit system for discharges to the waters of the State by the Administrator of the Environmental Protection Agency on September 5, 1974, and on December 11, 1974, the State issued

State Discharge Permit No. 75-DP-0491, NPDES Permit No. MD-0002518, which permitted discharges from the Conowingo Hydroelectric Power Plant under certain terms and conditions.

Pursuant to the provisions of Section 401(d), the above certification is issued subject to the following condition to insure that the operation of the facility will comply with appropriate requirements of State law:

1. The facility shall be operated at all times in such a manner as to conform to the requirements contained in State Permit No. 75-DP-0491 attached hereto.

Sincerely,

Herbert M. Sachs
Director

HMS:sdm
Attachment

MDE
MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101 • www.mde.maryland.gov

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Robert M. Summers, Ph.D.
Secretary

STATE DISCHARGE PERMIT NUMBER	10-DP-0491	NPDES PERMIT NUMBER	MD0002518
EFFECTIVE DATE	October 1, 2014	EXPIRATION DATE	September 30, 2019
MODIFICATION DATE:	Draft	REAPPLICATION DATE	September 30, 2018

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder, and the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq. and implementing regulations 40 CFR Parts 122, 123, 124, and 125, the Department of the Environment, hereinafter referred to as the "Department," hereby authorizes

Exelon Generation Company, LLC
2569 Shures Landing Road
Darlington, Maryland 21034

TO DISCHARGE FROM

Conowingo Hydroelectric Station, a hydroelectric power generating facility

LOCATED AT

2569 Shures Landing Road, Darlington, Harford County, Maryland 21034

VIA OUTFALL(S)

001 and 003 as identified and described herein

TO

Susquehanna River which is protected for (Use I-P) public water supply, water contact recreation, fishing, aquatic life, and wildlife in accordance with the following special and general conditions and map(s) made a part hereof.

I. SPECIAL CONDITIONS

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the effective period of this permit, the permittee is authorized to discharge sanitary wastewater via Outfall 001 (Maryland Coordinates 1544.6 E and 725.4 N). Outfall 001 is located at the sewage treatment plant.

As specified below, such discharge shall be limited and monitored by the permittee at the UV light discharge weir located in the ultraviolet room of the small building adjacent to the sewage treatment plant.

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				FREQUENCY OF ANALYSIS	SAMPLE TYPE	NOTES
	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS			
Flow	Report	Report	MGD					Continuous	Measured	
Biochemical Oxygen Demand (BOD_5)					30	45	mg/l	1/Week	8-Hour Composite	
Total Suspended Solids					30	45	mg/l	1/Week	8-Hour Composite	
Dissolved Oxygen				5.0			mg/l	1/Week	Grab	
E. Coli					126		MPN/ 100	1/Week	Grab	(1)
pH				6.5		8.5		1/Week	Grab	
Total Residual Chlorine						0.019	mg/l	1/Month	Grab	(2)

There shall be no discharge of polychlorinated biphenyl compounds (PCBs) from station equipment, such as those commonly used for transformer fluid.

The effluent limitations and monitoring requirements are based on an annual average flow of 14,350 gallons per day (gpd). In accordance with General Condition B.1, the Department must be notified at least 180 days before the annual average flow is expected to exceed this level. This requirement is not a flow limit.

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS – Continued from previous page

(1) The permittee shall use any 40CFR Part 136 approved method. The value is reported as a geometric mean.

(2) The minimum level (quantification level) for total residual chlorine is 0.10 mg/l. The permittee may report all results below this minimum level as "0 mg/l". All results reported below the minimum level shall be considered in compliance.

I. SPECIAL CONDITIONS

A.2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the effective period of this permit, the permittee is authorized to discharge combined river water from plant service units, main generating units, regulation gates, and the East Fish Lift via points of discharge collectively designated Outfall 003 (Maryland Coordinates 1546.1 E and 724.0 N).

As specified below, such discharge shall be limited and monitored by the permittee at locations specified below.

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				FREQUENCY OF ANALYSIS	SAMPLE TYPE	NOTES
	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS			
Dissolved Oxygen				5.0			mg/l	4/Hour	Continuous	(1) (2)

There shall be no discharge of polychlorinated biphenyl compounds (PCBs) from station equipment, such as those commonly used for transformer fluid.

The effluent limitations and monitoring requirements are based on an annual average flow of 80,400,000 gallons per day (gpd). In accordance with General Condition B.1, the Department must be notified at least 180 days before the annual average flow is expected to exceed this level. This requirement is not a flow limit.

(1) Continuous sampling required during the months of May through October of each year. The hourly minimum value shall be the arithmetic average of four instantaneous measurements taken 15 minutes apart. During periods when the continuous DO measurement system is not in use, the hourly minimum DO value shall be based on one measurement per hour collected by grab sample.

(2) Sampling Procedures:

DO shall be monitored at Station 643 located approximately 0.6 miles downstream of the power station. Samples shall be measured inside the shed, which receives river water pumped from the intake structure located approximately midway between Rowland Island and the shoreline. An assist pump can be used to supply flow to Station 643 during periods of low river flow.

DO shall be monitored in the Francis/Kaplan discharge boils and/or spill area (s) during periods when, in order to maintain permit compliance with the DO limitation, a Francis/Kaplan turbine is in operation at reduced gate or spillage is being provided via a regulation gate or the East Fish Lift in combination with vented Francis/Kaplan turbines. During these periods, the arithmetic average of the DO measurements, weighted for flow, in discharge boils of all operating turbines and/or spill areas, shall be used to determine compliance.

During periods when the river water collection system at Station 643 is out of service due to routine or emergency maintenance, loss of power or high river flows, and/or hydrological or weather conditions prevent safe access to the sample intake structure, the permittee shall obtain samples for DO measurement twice per day at the shoreline adjacent to the sample shed.

I. SPECIAL CONDITIONS

A.3. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the effective period of this permit, the permittee is authorized to discharge sump wastewater to Outfall 003 via the oil water separator, Monitoring Point 103 (Maryland Coordinates 1544.6 E and 725.6N). MP103 includes(collective points of discharge - combined river water from plant seepage sumps. Outfall 003 (MP103, station service units, main generating units, regulation gates, and the East Fish Lift) discharges to the Susquehanna River.

As specified below, such discharge shall be limited and monitored by the permittee at Monitoring Point 103, a 1 inch sample tap installed on the 14-inch discharge pipe of the oil water separator.

PARAMETER	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				FREQUENCY OF ANALYSIS	SAMPLE TYPE	NOTES
	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS			
Oil and Grease						15	mg/l	1/Quarter	Grab	

There shall be no discharge of polychlorinated biphenyl compounds (PCBs) from station equipment, such as those commonly used for transformer fluid.

The effluent limitations and monitoring requirements are based on an annual average flow of 1,152,000 gallons per day (gpd). In accordance with General Condition B.1, the Department must be notified at least 180 days before the annual average flow is expected to exceed this level. This requirement is not a flow limit.

I. SPECIAL CONDITIONS

B. DEFINITIONS

1. "BOD_5 (Biochemical Oxygen Demand)" means the amount of oxygen consumed in a standard BOD_5 test without the use of a nitrification inhibitor at 20 degree centigrade on an unfiltered sample.

2. "Bypass" means the intentional diversion of wastes from any portion of a treatment facility.

3. "Clean Water Act: means the Federal Water Pollution Control Act, as amended, 33 U.S.C. Section 1251 et seq.

4. "CFR" means the Code of Federal Regulations.

5. "COMAR" means the Code of Maryland Regulations.

6. "Composite sample" means a combination of individual samples obtained at least at hourly intervals over a time period. Either the volume of each individual sample is proportional to discharge flow rates or the sampling interval (for constant volume samples) is proportional to the flow rates over the time period used to produce the composite.

7. "Daily determination of concentration" means one analysis performed on any given sample representing flow during a calendar day, with one number in mg/l or other appropriate units as an outcome.

8. "Daily determination of discharge of constituents by mass loading" means a value which is calculated by multiplying the daily determination of concentration times flow in millions of gallons per day times 8.34. This results in a mass loading expressed in pounds per day.

9. The "daily maximum" effluent concentration means the highest reading of any daily determination of concentration.

10. "Department" means the Maryland Department of the Environment (MDE).

11. "Estimated" flow means a calculated volume or discharge rate which is based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters, and batch discharge volumes.

12. "Grab sample" means an individual sample collected over a period of time not exceeding 15 minutes. Grab samples collected for pH and total residual chlorine shall be analyzed within 15 minutes of time of sample collection.

13. "Geometric Mean" (G.M.) shall be calculated as follows: G.M. = $[(X_1) (X_2) (X_3) \ldots (X_n)]$ raised to the power of (1/n), where "X" is the concentration, in each sample, of the parameter being measured and n is the number of samples taken each month.

14. ""Measured" flow means any method of liquid volume measurement the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

15. The "minimum" value means the lowest value measured during a 24-hour period.

16. The "monthly, quarterly, semi-annual, or annual average" effluent concentration means the value calculated by computing the arithmetic mean of all the daily determinations of concentration made during any calendar-month, 3-month, 6-month, or 12-month period respectively.

17. ""NPDES" (National Pollutant Discharge Elimination System)" means the national system for issuing permits as designated by the Clean Water Act.

18. "Nitrogen, Total" means the sum of organic nitrogen, ammonia nitrogen, nitrate, and nitrite. All values shall be reported as nitrogen (as N).

19. "Oil and Grease" refers to the use of and results yielded from EPA Method 1664 (or any EPA approved revisions of this analytical test method approved for use with Clean Water Act monitoring programs.

20. "Outfall" means the location where the effluent is discharged into the receiving waters.

21. "Permittee" means an individual or organization holding the discharge permit issued by the Department.

22. "POTW" means a publicly owned treatment works.

23. "Sampling Point" means the effluent sampling location in the outfall line(s) downstream from the last addition point or as otherwise specified.

24. "TSS (Total Suspended Solids)" means the residue retained on the filter by an analysis done in accordance with Standard Methods or other approved methods.

25. "Upset" means the exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

C. TOXIC POLLUTANT REPORTING

The permittee shall notify the Department as soon as it is known or suspected that any toxic pollutants which are not specifically limited by this permit have been discharged at levels specified in 40 CFR Part 122.42(a).

D. REMOVED SUBSTANCES

1. Within 30 days after notification by the Department, the permittee shall provide information on the disposal of any removed substances, as defined by General Condition B.7, including the following information:

a. A suitable map showing all areas used for disposal of removed substances.

b. The physical, chemical, and biological characteristics, as appropriate; quantities of any removed substances; and the method of disposal.

c. If disposal is handled by persons other than the permittee, identification of the contractor or subcontractor, their mailing address, and the information specified in a and b above.

2. The Department's notification may also require the permittee to provide the above information prior to the use of new or additional disposal areas, contractors, or subcontractors.

E. ANALYTICAL LABORATORY

Within 30 days after the effective date of this permit, the permittee shall submit to the Department the name and address of the analytical laboratory (including the permittee's own laboratory) which is used to perform the monitoring required by this permit.

If the laboratory changes during the effective period of this permit, the permittee shall notify the Department of the new laboratory within 30 days after the change.

F. WASTEWATER OPERATOR CERTIFICATION

As of the effective date of this permit, the permittee's facility shall be operated by an wastewater operator duly certified by the Maryland Board of Waterworks and Waste Systems Operators. Certification shall be for operation of a Class 3 wastewater treatment plant, unless the Board determines that a different classification is appropriate. At no time during the effective period of this permit shall the treatment facility be operated for more than two months without a certified operator.

G. FLOW MONITORING

In lieu of providing measured flow (defined in the Special Conditions Definitions section) at Outfall 003 and Monitoring Point 103 the permittee may estimate flows and submit the following information at the time of submission of the initial discharge monitoring report and/or upon any change in the methodology:

1. a description of the methodology used to estimate flow at each outfall where flow measurement equipment is not present;

2. documentation appropriate to the methodology utilized which provides information necessary to support the validity of the reported flow estimate. If actual measurements or observations are made, a description of typical sampling times, locations, and persons performing the measurements/observations should also be provided.

3. a description of the factors (e.g., batch discharges, intermittent operation, etc.) which cause flow at the outfall to fluctuate significantly from the estimate provided.

H. FLOW BASIS FOR ANNUAL DISCHARGE PERMIT FEE

The Department will calculate permit fees annually and will invoice the permittee based upon average discharge flow. Permit fees are payable in advance to the Department by July 1 of each fiscal year (July 1 through June 30).

The permittee shall provide to the Department's Industrial and General Permits Division by May 1 of each year an updated average discharge flow value for the next billing period if the flow volume used to calculate the most recent annual permit fee (or, if the permit was renewed within the past year, the flow volume used to calculate the application fee) differs significantly from either of the following flow determinations:

1. average flow data from the current fiscal year as reported on the permittee's discharge monitoring reports, or

2. the estimated flow volume for the next billing period based upon recent changes at the facility.

The permittee shall include with their flow revision notification a summary of flow data reported on discharge monitoring reports for the previous year and any other supporting documentation to be used as the basis for the flow determination.

I. REAPPLICATION FOR A PERMIT

The Department is implementing a schedule for issuance of discharge permits grouped by geographical areas (watersheds). To implement the watershed-based schedule, the Department may revoke and reissue this permit concurrently with other permits in the watershed.

Unless the Department grants permission for a later date, the permittee shall submit a renewal application by no later than 12 months prior to the expiration date on the first page of this permit, or notify the Department of the intent to cease discharging by the expiration date.

In the event that a timely and sufficient reapplication has been submitted and the Department is unable, through no fault of the permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

J. PERMIT REOPENER FOR TOTAL MAXIMUM DAILY LOAD (TMDL)

This permit is consistent with the terms and conditions of the Chesapeake Bay Total Maximum Daily Load (TMDL) for Sediments, Nitrogen and Phosphorus, approved December 29, 2010.

At this time, the permit limits total suspended solids, but does not introduce limits for total nitrogen and total phosphorus. Such limitations are to prevent water quality degradation of the receiving waters and ultimately the Chesapeake Bay. This determination has been based on facility operations and/or discharge characteristics.

To ensure the Chesapeake Bay and its tributaries are protected from discharges of sediments, nitrogen and phosphorus, this permit may be reopened as a major modification to implement any applicable requirements associated with the Chesapeake Bay TMDL. The permittee may become subject to a Department-issued General Permit regarding the discharge of such pollutants.

K. BIOMONITORING PROGRAM – [Reserved]

L. TOXICITY REDUCTION EVALUATION

The permittee shall conduct a Toxicity Reduction Evaluation (TRE) when a review of toxicity test data by the Department indicates unacceptable acute or chronic effluent toxicity. A TRE is an investigation conducted to identify the causative agents of effluent toxicity, isolate the source(s), determine the effectiveness of control options, implement the necessary control measures and then confirm the reduction in toxicity.

1. Within 90 days following notification by the Department that a TRE is required, the permittee shall submit a plan of study and schedule for conducting a TRE. The permittee shall conduct the TRE study consistent with the submitted plan and schedule.

2. This plan should follow the framework presented in Generalized Methods for Conducting Industrial Toxicity Reduction Evaluations (EPA/600/2-88/070).

3. Beginning 60 days following the date of the Department's acceptance of the TRE study plan and every 60 days thereafter, the permittee shall submit progress reports including all relevant test data to the Department. This shall continue until completion of the toxicity reduction confirmation.

4. Within 60 days following completion of the toxicity identification, or the source identification phase of the TRE, the permittee shall submit to the Department a plan and schedule for implementing those measures necessary to eliminate acute toxicity and/or reduce chronic toxicity to acceptable levels. The implementation of these measures shall begin immediately upon submission of this plan.

5. Within 60 days after completing implementation of the control measures to eliminate or reduce toxicity, the permittee shall submit to the Department for approval a study plan to confirm the elimination or reduction of toxicity by using biomonitoring.

6. If, for any reason, the implemented measures do not result in compliance with the Department's toxicity limitations, the permittee shall continue the TRE.

M. MIXING ZONES AND POLLUTION PREVENTION – [Reserved]

N. PROTECTION OF WATER QUALITY

It is a violation of this permit to discharge any substance not otherwise listed under the permit's "Effluent Limitations and Monitoring Requirements" special conditions at a level which would cause or contribute to any exceedance of the numerical water quality standards in COMAR 26.08.02.03 unless the level and the substance were disclosed in writing in the permit application prior to the issuance of the permit. If a discharge regulated by this permit causes or contributes to an exceedance of the water quality standards in COMAR 26.08.02.03, including but not limited to the general water quality standards, or if the discharge includes a pollutant that was not disclosed or addressed in the public

record for the permit determination, the Department is authorized to modify, suspend or revoke this permit or take enforcement action to address unlawful discharges of pollutants.

O. FISH TANK DISCHARGE

The permittee is authorized to discharge variable amounts of river water containing fish from the fish tanks with the sole purpose to return the live fish to the river via the existing fish lift(s).

P. STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY – [Reserved]

II. GENERAL CONDITIONS

A. MONITORING AND REPORTING

1. REPRESENTATIVE SAMPLING

Samples and measurements taken as required herein shall be taken at such times as to be representative of the quantity and quality of the discharges during the specified monitoring periods.

2. REPORTING-MONITORING RESULTS SUBMITTED MONTHLY

Monitoring results obtained during each calendar month shall be summarized on a Discharge Monitoring Report Form (EPA No. 3320-1) and submitted to the Department postmarked no later than the 28th day of the following month. Reporting periods shall end on the last day of each month. Duplicate signed copies of the Discharge Monitoring Reports shall be submitted to:

Maryland Department of the Environment
Water Management Administration
Compliance Program
1800 Washington Boulevard
Baltimore, Maryland 21230-1708

and to

U.S. Environmental Protection Agency Region III
Office of NPDES Permits and Enforcement
NPDES Enforcement Branch (3WP42)
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

3. SAMPLING AND ANALYSIS METHODS

The analytical and sampling methods used shall conform to procedures for the analysis of pollutants as identified in Title 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants" unless otherwise specified.

4. DATA RECORDING REQUIREMENTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. the exact place, date, and time of sampling or measurement;
b. the person(s) who performed the sampling or measurement;
c. the dates and times the analyses were performed;
d. the person(s) who performed the analyses;
e. the analytical techniques or methods used; and
f. the results of all required analyses.

5. MONITORING EQUIPMENT MAINTENANCE

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation to insure accuracy of measurements.

6. ADDITIONAL MONITORING BY PERMITTEE

If the permittee monitors any pollutant, using approved analytical methods as specified above, at the locations designated herein more frequently than required by this permit, the results of such monitoring, including the increased frequency, shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report form (EPA No. 3320-1).

7. RECORDS RETENTION

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and original recordings from continuous monitoring instrumentation shall be retained for a minimum of three years. This period shall be automatically extended during the course of litigation, or when requested by the Department.

B. MANAGEMENT REQUIREMENTS

1. CHANGE IN DISCHARGE

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit at a level in excess of that authorized shall constitute a violation of the terms and conditions of this permit. The permittee shall report any anticipated facility expansions, production increases, or process modifications which will result in new, different or an increased discharge of pollutants by submitting a new application at least 180 days prior to the commencement of the changed discharge except that if the change only affects a listed pollutant and will not violate the effluent limitations specified in this permit, by providing written notice to the Department. Following such notice, the permit may be modified by the Department to include new effluent limitations on those pollutants.

2. NONCOMPLIANCE WITH EFFLUENT LIMITATIONS

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum or daily minimum effluent limitation specified in this permit, the permittee

shall notify the Inspection and Compliance Program by telephone at (410) 537-3510 within 24 hours of becoming aware of the noncompliance. Within five calendar days, the permittee shall provide the Department with the following information in writing:

a. a description of the non-complying discharge including its impact upon the receiving waters;

b. cause of noncompliance;

c. anticipated time the condition of noncompliance is expected to continue or if such condition has been corrected, the duration of the period of noncompliance;

d. steps taken by the permittee to reduce and eliminate the non-complying discharge;

e. steps to be taken by the permittee to prevent recurrence of the condition of noncompliance; and

f. a description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge.

3. FACILITIES OPERATION

All treatment, control and monitoring facilities, or systems installed or used by the permittee, are to be maintained in good working order and operated efficiently.

4. ADVERSE IMPACT

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to waters of the State or to human health resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. BYPASSING

Any bypass of treatment facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited unless:

a. the bypass is unavoidable to prevent a loss of life, personal injury or substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources;

b. there are no feasible alternatives;

c. notification is received by the Department within 24 hours (if orally notified, then followed by a written submission within five calendar days of the permittee's becoming aware of the bypass). Where the need for a bypass is known (or should have been known) in advance, this notification shall be submitted to the Department for approval at least ten calendar days before the date of bypass or at the earliest possible date if the period of advance knowledge is less than ten calendar days; and

d. the bypass is allowed under conditions determined by the Department to be necessary to minimize adverse effects.

6. CONDITIONS NECESSARY FOR DEMONSTRATION OF AN UPSET

An upset shall constitute an affirmative defense to an action brought for noncompliance with technology-based effluent limitations only if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

a. an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. the permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;

c. the permittee submitted a 24-hour notification of upset in accordance with the reporting requirements of General Condition II.B.2 above;

d. the permittee submitted, within five (5) calendar days of becoming aware of the upset, documentation to support and justify the upset; and

e. the permittee complied with any remedial measures required to minimize adverse impact.

7. REMOVED SUBSTANCES

Wastes such as solids, sludges, or other pollutants removed from or resulting from treatment or control of wastewaters, or facility operations, shall be disposed of in a manner to prevent any removed substances or runoff from such substances from entering or from being placed in a location where they may enter the waters of the State.

8. POWER FAILURE

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. provide an alternative power source sufficient to operate the wastewater collection and treatment facilities or,

b. halt, reduce or otherwise control production and all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater collection and treatment facilities.

C. RESPONSIBILITIES

1. RIGHT OF ENTRY

The permittee shall permit the Secretary of the Department, the Regional Administrator for the Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials to:

a. enter upon the permittee's premises where an effluent source is located or where any records are required to be kept under the terms and conditions of this permit;

b. access and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;

c. inspect, at reasonable times, any monitoring equipment or monitoring method required in this permit;

d. inspect, at reasonable times, any collection, treatment, pollution management, or discharge facilities required under this permit; and

e. sample, at reasonable times, any discharge of pollutants.

2. TRANSFER OF OWNERSHIP OR CONTROL OF FACILITIES

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the permit may be transferred to another person if:

a. the permittee notifies the Department in writing, of the proposed transfer;

b. a written agreement, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities of current and new permittees for compliance with the liability for the terms and conditions of this permit, is submitted to the Department; and

c. neither the current permittee nor the new permittee receive notification from the Department, within 30 calendar days, of intent to modify, revoke, reissue or terminate the existing permit.

3. REAPPLICATION FOR A PERMIT –[Reserved]

4. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Section 308 of the Clean Water Act, 33 U.S.C. § 1318, all submitted data shall be available for public inspection at the offices of the Department and the Regional Administrator of the Environmental Protection Agency.

5. PERMIT MODIFICATION

A permit may be modified by the Department upon written request of the permittee and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in 40 CFR § 122.62 and 122.63.

6. PERMIT MODIFICATION, SUSPENSION, OR REVOCATION

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked and reissued in whole or in part during its term for causes including, but not limited to, the following:

a. violation of any terms or conditions of this permit;

b. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; or

d. a determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination.

e. upon a final, unreviewable determination that the permittee lacks, or is in violation, of any federal, state, or local approval necessary to conduct the activities by this permit.

7. TOXIC POLLUTANTS

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such toxic effluent standard or prohibition) is established by the U.S. Environmental Protection Agency, or pursuant to Section 9-314 of the Environment Article, Annotated Code of Maryland, for a toxic pollutant which is present in the discharges authorized herein and such standard is more stringent than any limitation upon such pollutant in this permit, this permit shall be revoked and reissued or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified. Any effluent standard established in this case for a pollutant which is injurious to human health is effective and enforceable by the time set forth in the promulgated standard, even absent permit modification.

8. OIL AND HAZARDOUS SUBSTANCES PROHIBITED

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibility, liability, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act (33. U.S.C. § 1321), or under the Annotated Code of Maryland.

9. CIVIL AND CRIMINAL LIABILITY

Except as provided in permit conditions on "bypassing," "upset," and "power failure," nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for noncompliance with Title 9 of the Environment Article, Annotated Code of Maryland or any federal, local, or other State law or regulation.

10. PROPERTY RIGHTS/COMPLIANCE WITH OTHER REQUIREMENTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

11. SEVERABILITY

The provisions of this permit are severable. If any provisions of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this permit to any circumstances is held invalid, its application to other circumstances shall not be affected.

12. WATER CONSTRUCTION AND OBSTRUCTION

This permit does not authorize the construction or placing of physical structures, facilities, or debris, or the undertaking of related activities in any waters of the State.

13. COMPLIANCE WITH WATER POLLUTION ABATEMENT STATUTES

The permittee shall comply at all times with the provisions of the Environment Article, Title 7, Subtitle 2 and Title 9, Subtitle 3 of the Annotated Code of Maryland and the Clean Water Act, 33 U.S.C. § 1251 et seq.

14. ACTION ON VIOLATIONS

The issue or reissue of this permit does not constitute a decision by the State not to proceed in administrative, civil, or criminal action for any violations of State law or regulations occurring before the issue or reissue of this permit, nor a waiver of the State's right to do so.

15. CIVIL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to civil penalties for violations of State water pollution control laws set forth in Section 9-342 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act or in a permit issued under Section 404 of the Act, is subject to a civil penalty not to exceed $37,500 per day for each violation.

16. CRIMINAL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to criminal penalties for violations of State water pollution control laws set forth in Section 9-343 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that:

a. any person who negligently violates Section 301, 302, 306, 307, 308, 318, or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one (1) year, or by both.

b. any person who knowingly violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than three (3) years, or by both.

c. any person who knowingly violates Section 301, 302, 306, 307, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, is subject to a fine of not more $250,000 or imprisonment of not more than 15 years, or both.

d. any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with or renders

inaccurate any monitoring device or method required to be maintained under the Act, is subject to a fine of not more than $10,000 or by imprisonment for not more than two (2) years, or by both.

17. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

18. SIGNATORY REQUIREMENTS

All applications, reports, or information submitted to the Director shall be signed and certified as required by 40 CFR 122.22.

19. REOPENER CLAUSE FOR PERMITS

This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301, 304, and 307 of the Clean Water Act [33 USCS §§ 1311, 1314, 1317] if the effluent standard or limitation so issued or approved:

a. contains different conditions or is otherwise more stringent than any effluent limitation in this permit or

b. controls any pollutant not limited in this permit. This permit, as modified or reissued under this paragraph, shall also contain any other requirements of the Act then applicable.

D. AUTHORITY TO ISSUE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

On September 5, 1974, the Administrator of the U.S. Environmental Protection Agency approved the proposal submitted by the State of Maryland for the operation of a permit program for discharges into navigable waters pursuant to Section 402 of the Clean Water Act, 33 U.S.C. Section 1342.

Pursuant to the aforementioned approval, this discharge permit is both a State of Maryland discharge permit and a NPDES permit.

This permit and the authorization to discharge shall expire at midnight on the expiration date. The permittee shall not discharge after that date unless a new application has been submitted to the Department in accordance with the renewal application provisions of this permit.

Jay G. Sakai, Director
Water Management Administration

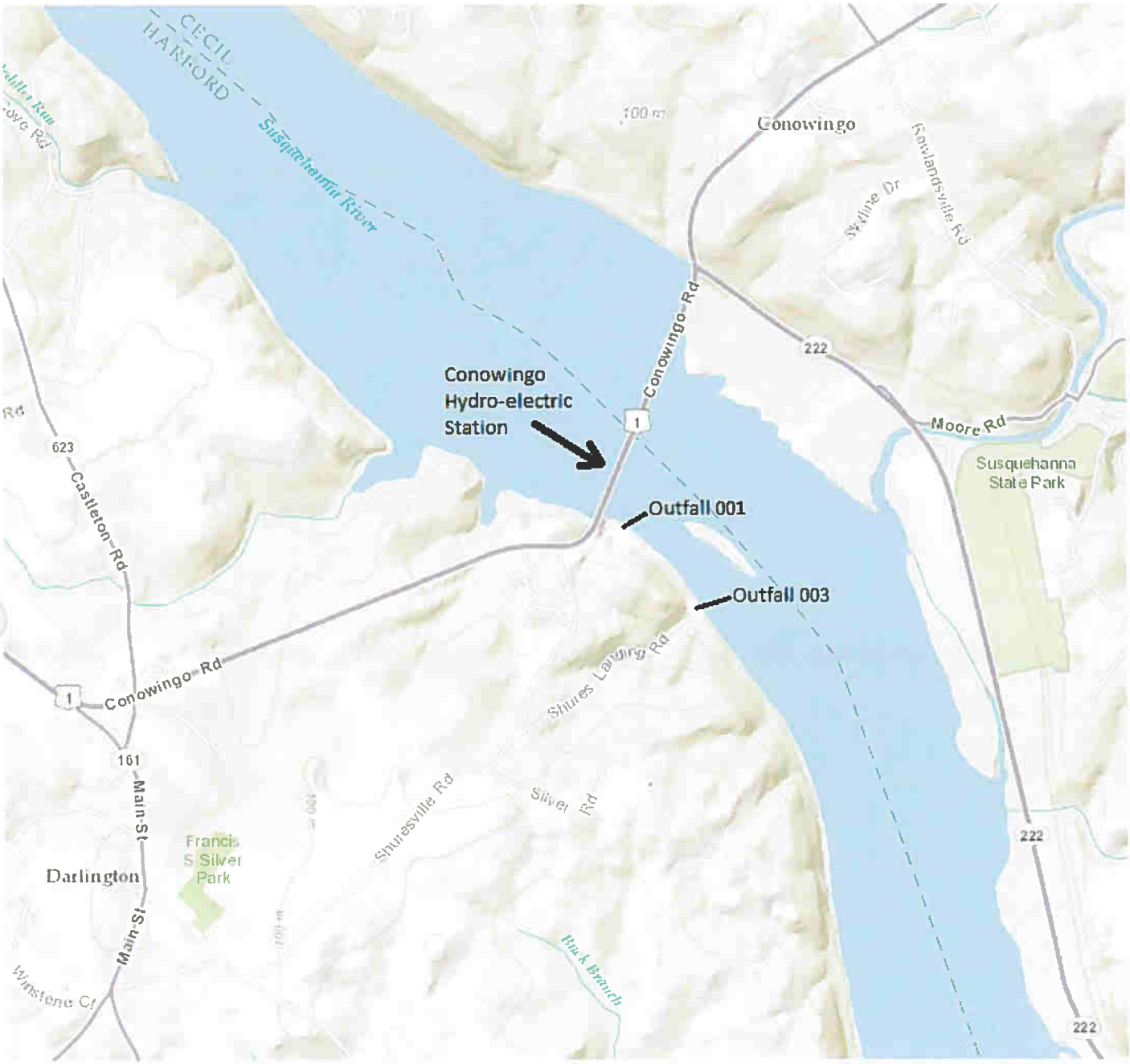

Figure 1 - Site Map with Outfall Locations

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101 • www.mde.maryland.gov

SEP - 2 2014

CERTIFIED MAIL

Amy Hetherington, Sr. Program Manager-Water-Quality
Fort Smallwood Road Complex
1005 Brandon Shores Road, Suite 200
Baltimore, MD 21226

Re: State Discharge Permit No. 10DP0491, NPDES Permit MD0002518

Dear Ms. Hetherington:

Enclosed is the issued discharge permit referenced above with the effective date indicated on the cover page. The permittee is responsible for complying with all permit conditions. You are therefore advised to read the permit carefully and become thoroughly familiar with the requirements.

Enclosed are (EPA No. 3320-1) Discharge Monitoring Report (DMR) forms, which must be completed for each reporting period and submitted to the Department in accordance with the requirements of the permit. Copies of these forms can also be downloaded from the Department's website (the shortcut is www.mde.maryland.gov/assets/document/permit/newdmr.pdf). Using the latest version of Adobe Acrobat Reader, the DMR form can be completed from a keyboard and printed for mailing to the Department.

You will also find enclosed a copy of the Federal Register, Part 136 - "Guidelines Establishing Test Procedures for Analysis of Pollutants". Unless otherwise specified, these guidelines are to be used for the analyses required by this permit. The most current version of 40 C.F.R. Part 136 can be found online at EPA's website. The link is www.epa.gov/epahome/cfr40.htm. Finally you'll also find enclosed a brochure for NetDMRs.

Please direct all future correspondence regarding permit compliance to the following address:

Attention: Discharge Monitoring Reports
Water Management Administration – Compliance Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 425
Baltimore, Maryland 21230-1708

If you have any questions, please do not hesitate to call Paul Hlavinka, Industrial and General Permits Division, at 410-537-3631.

Sincerely,

Jay G. Sakai, Director
Water Management Administration

JGS:kd
Enclosures