September 11, 2017

Via email to: elder.ghigiarelli@maryland.gov

Elder Ghigiarelli, Jr.,
Deputy Program Administrator
Wetlands and Waterways Program
Water Management Administration
Maryland Department of the Environment (MDE)
1800 Washington Boulevard, Suite 430
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Re: Conowingo Hydroelectric Project, Application for Water Quality Certification, Application # 17-WQC-02

Dear Mr. Ghigiarelli:

Please accept the following comments on Exelon Generation Company's application for Clean Water Act Section 401 water quality certification ("Exelon Application"),[1] which Exelon is requesting as a necessary precondition of its related application to the Federal Energy Regulatory Commission ("FERC") for a new 50-year license for the continued operation of the Conowingo Dam Project.

FERC itself has acknowledged that one of the "primary issues" associated with relicensing the Conowingo Dam Project is the threat of "sedimentation effects on aquatic resources downstream of Conowingo dam, including the Chesapeake Bay."[2] Unfortunately, FERC has also made clear, through its inadequate study of that threat, that Maryland cannot count on FERC to impose conditions on the Project needed to prevent or offset Project-induced scouring of sediment concentrated behind the Dam.[3] Unless Maryland imposes such conditions, its water quality goals and pollution control measures could be undermined by catastrophic sediment and nutrient discharges during one or more predicted high-flow events during the

[1] Exelon Generation, Section 401 Water Quality Certification Application, Conowingo Hydroelectric Project (FERC Project No. 405), Cecil and Harford Counties (May 17, 2017).

[2] Final Multi-Project Environmental Impact Statement for Hydropower Licenses, Susquehanna River Hydroelectric Projects (March 2015) at xxxviii.

[3] *Id*. at 139 (characterizing sediment as a "watershed-wide issue" and dismissing the profound effect of the Project in artificially concentrating sediment behind the Project's Dam).

requested license period.[4] But Exelon has failed to provide sufficient information about the current and future effects of the Conowingo facility's ongoing operation on water quality, and has failed to propose measures to offset those effects. Exelon has also failed to account for the additive effects of climate change upon sediment scouring, and Maryland must consider these impacts in its certification analysis. We therefore urge Maryland to either impose conditions requiring Exelon to participate as a financial partner in a specific plan for removing a minimum of 4 million tons of sediment from Conowingo reservoir annually until 100 million tons are removed, and for maintaining the same level thereafter. Alternatively, Maryland should deny the application due to its deficiencies.

I. LEGAL BACKGROUND

Section 401 of the Clean Water Act ("CWA") gives states the authority to review any federally-permitted or licensed activity that may result in a discharge to navigable waters, and to condition the permit or license upon a certification that any discharge would comply with key provisions of the CWA and appropriate state laws.[5] This expansive certification authority preserves a substantial role for the states in protecting water quality, even when permitting authority lies solely in federal hands. As the U.S. Supreme Court characterized it:

> State certifications under § 401 are essential in the scheme to preserve state authority to address the broad range of pollution… "No polluter will be able to hide behind a Federal license or permit as an excuse for a violation of water quality standard[s]. No polluter will be able to make major investments in facilities under a Federal license or permit without providing assurance that the facility will comply with water quality standards. No State water pollution control agency will be confronted with a fait accompli by an industry that has built a plant without consideration of water quality requirements."[6]

A. Application of CWA § 401

Pursuant to § 401 of the CWA, a state certification is needed when there is:

> Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates

[4] *See* USGS, *et al.*, Lower Susquehanna River Watershed Assessment, Maryland and Pennsylvania at 65, Table 4-3 (May 2015) (hereafter "LSRWA"), http://dnr.maryland.gov/waters/bay/Documents/LSRWA/Reports/LSRWAFinalMain20160307.pdf (setting forth the annual exceedance probability for various return interval flow events, with expected flow estimates for the flow gauge at Conowingo Dam).

[5] 33 U.S.C. § 1341(a)(1).

[6] *S.D. Warren Co. v. Maine Bd. of Envtl. Protection*, 547 U.S. 370, 386 (2006) (citation omitted).

> or will originate … that any such discharge will comply with the applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of this title.[7]

The term "discharge" has been broadly interpreted to include the release of anything that flows out, including discharges from hydroelectric dams.[8] The discharge also need not be certain; rather, the mere possibility of a discharge is sufficient to trigger the requirements of § 401.[9]

When § 401 applies to a project due to a potential discharge, the certification process applies to the "activity as a whole," not merely to the discharge itself.[10] Therefore, the certifying state must determine whether any aspect of the project (not just a discharge) would violate the relevant federal or state laws. In the case of a hydroelectric dam project, for example, a certifying state must apply the certification process to a wide range of actions such as the trapping of nutrients and sediment behind the dam, changes to stream flow and water temperature, increases in total dissolved gas levels below the dam, and the release of sediments and nutrients below the dam during both routine operation and increasingly common storm events.[11]

B. Procedure

Section 401(d) of the CWA directs states to certify § 401 projects only when the project activities would comply with all applicable federal and state laws. These laws include the federal effluent limitations (§ 1311), federal water quality related effluent limitations (§ 1312), state water quality standards and implementation plans (§ 1313), federal new source performance standards (§ 1316), toxic and pretreatment effluent standards (§ 1317), and "any other appropriate requirement of State law."[12]

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[7] 33 U.S.C. § 1341(a)(1).

[8] *S.D. Warren Co.*, 547 U.S. at 373.

[9] 33 U.S.C. § 1341(a)(1) (stating that certification is required when an activity "may" result in a discharge); *see also* U.S. EPA, *Clean Water Act Section 401 Water Quality Certification: A Water Quality Protection Tool for States and Tribes* (2010) at 4, https://www.epa.gov/sites/production/files/2016-11/documents/cwa_401_handbook_2010.pdf ("EPA § 401 Guidance").

[10] *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 712 (1994).

[11] Due to climate change, it is predicted that all parts of the U.S. will see increases in storm intensities, and the Northeast will also experience a 58% increase in the average number of days with very heavy precipitation. Garfin et al., *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment* (2013), at 6, 8, http://www.swcarr.arizona.edu/sites/all/themes/files/SW-NCA-color-FINALweb.pdf; Hall and Stuntz, *Climate Change and Great Lakes Water Resources* (Nov. 2007) at 6-7, http://online.nwf.org/site/DocServer/Climate_Change_and_Great_Lakes_Water_Resources_Report_FI.pdf.

[12] 33 U.S.C. § 1341(a)(1), (d).

If a project would not comply with the applicable laws, a state must either deny § 401 certification,[13] or conditionally grant certification with "any effluent limitations and other limitations, and monitoring requirements necessary to assure" compliance with the law.[14] If a state denies certification, the federal permit or license for the project may not be issued.[15] In this way, § 401 grants states the authority to halt projects that illegally harm water quality. Alternatively, in cases where specific permit conditions would ensure compliance with the law, a state may conditionally grant certification and these conditions would become binding limitations on the permit or license.[16]

States must complete their § 401 certifications within "a reasonable period of time (which shall not exceed one year) after receipt of [a certification] request."[17] If a state fails to act on a certification within a year's time, the certification process is deemed waived.[18] However, the waiver period only applies to the certification decision. Any conditions imposed on a § 401 certification need not be completed within a year's time and may extend into the licensing period and beyond.[19]

The federal agency responsible for issuing the permit or license may, by regulation, choose to impose a waiver period that is shorter than one year, but the certifying state has the authority to determine when the waiver period begins.[20] FERC's pertinent regulations maintains the one-year-long waiver period and provides for waiver only "if the certifying agency has not denied or granted certification by one year after the date the certifying agency received a written request for certification."[21] In the state of Maryland, a "written request for certification" must be a complete application which includes the information outlined in the Code of Md. Regulations ("COMAR") 26.08.02.10(B). Therefore, the Maryland Department of the Environment ("MDE") must make a decision on Exelon's application for certification for its FERC relicensing within

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[13] *Id.* § 1341(a)(1).

[14] *Id.* § 1341(d).

[15] *Id.* § 1341(a)(1).

[16] *Id.* § 1341(d).

[17] *Id.* § 1341(a)(1).

[18] *Id*.

[19] *Alcoa Power Generating Inc. v. FERC*, 643 F.3d 963, 974 (D.C. Cir. 2011).

[20] *See, e.g.*, *Ackels v. EPA*, 7 F.3d 862 (9th Cir. 1993) (noting that EPA's NPDES regulations require state certification within sixty days, but also noting that EPA had discretion to accept certification after sixty days); *City of Fredericksburg v. FERC*, 876 F.2d 1109, 1111-12 (4th Cir. 1989) (holding that the state of Virginia was permitted to impose its own filing procedures on certification requests and that the certification waiver clock never began in that case because the applicant never made a formal application for certification in accordance with Virginia's requirements).

[21] 18 C.F.R. § 4.34(b)(5)(iii).

one year of the date it received a complete application from Exelon that fulfilled COMAR 26.08.02.10(B), likely May 17, 2017.

Furthermore, Maryland regulations state that MDE must provide public notice of every application for certification, accept written comments on the application, and hold a public hearing when "(1) [t]he Department determines the activity requiring certification is of broad, general interest; or (2) The application for certification generated substantial public interest as indicated by written comments concerning water quality issues."[22] MDE has already indicated it intends to hold a public hearing on the Conowingo Dam relicensing § 401 certification.[23]

C. Scope of State Authority

States have extensive authority to deny or impose conditions during the § 401 certification process. As EPA has explained in recent guidance, "[c]onsiderations can be quite broad so long as they relate to water quality," and "[c]ertification may address concerns related to the integrity of the aquatic resource and need not be specifically tied to a discharge."[24] In addition to ensuring compliance with the statutorily enumerated provisions of the CWA (§§ 1311, 1312, 1313, 1316, and 1317), certifying states must assure compliance with "any other appropriate requirement of State law."[25] Courts have consistently interpreted this provision to mean that all state water quality standards must be satisfied.[26] State water quality standards include designated uses for water bodies,[27] as well as the quantitative (numeric) and qualitative (narrative) criteria needed to achieve the designated uses,[28] and anti-degradation.[29] Therefore, certifying states have the obligation to ensure compliance with not only numeric water quality standards (and the total maximum daily loads ("TMDLs") used to enforce them), but also mandates designed to protect recreational uses and aquatic life.[30] Indeed, courts have repeatedly allowed certifying states to deny certifications based on the need to comply with state water

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[22] COMAR 26.08.02.10(C), (D).

[23] Maryland Department of the Environment, Public Notice, Proposed Relicensing of the Conowingo Hydroelectric Project (Aug. 8, 2017), http://mde.maryland.gov/programs/Water/WetlandsandWaterways/Documents/Conowingo-PN-Comment-Period-Ext-8-8-17.pdf.

[24] EPA § 401 Guidance, *supra* note 9, at 23.

[25] 33 U.S.C. § 1341(d).

[26] *See, e.g.*, *PUD No. 1 of Jefferson Co.*, 511 U.S. 700 (holding that state water quality standards, including minimum stream flow requirements, should be enforced through § 401 certifications).

[27] 40 C.F.R. § 131.10.

[28] *Id.* § 131.11.

[29] *Id.* § 131.12.

[30] *Anacostia Riverkeeper Inc. v. Jackson*, 798 F. Supp. 2d 210, 238 (D.D.C. 2011) (holding that a state's total maximum daily loads for a water body must ensure protection of all state water quality standards, including *all* designated uses and water quality criteria, in order to satisfy the CWA).

quality standards, including non-quantitative standards such as the protection of aquatic life and shellfish habitat.[31]

In the case of Exelon's application for certification, the legal mandate to expansively enforce all state water quality standards prevents Exelon from simply relying on the Chesapeake Bay TMDL to absolve itself of any obligation to address the sediment pollution from the Dam. The Chesapeake Bay TMDL did not include a wasteload or load allocation to accommodate discharges of sediment or nutrients scoured from behind the Dam, and did not purport to relieve Exelon of its responsibility for such discharges. MDE must instead look beyond the TMDL and independently ensure the project's sediment discharges do not interfere with attainment of the Chesapeake Bay TMDL, or with the designated uses which ensure support of estuarine and marine aquatic life and shellfish harvesting.[32] MDE must also ensure compliance with Maryland's narrative water quality standards which prohibit pollution by any material in an amount that would "[c]hange the existing color to produce objectionable color for aesthetic purposes" or "[i]nterfere directly or indirectly with designated uses," among other things.[33] In other words, MDE may not grant § 401 certification unless it imposes conditions which prevent the violation of all numeric and narrative water quality standards, and all designated uses.

D. Review of § 401 Certification Decisions

The federal permitting or licensing agency has no authority to review a state's decision about a § 401 certification. If a state denies certification, the federal agency may not issue the permit or license,[34] and if the state conditionally grants certification, all state conditions must be included in the permit or license without review.[35] Only a court can review the legality of state-imposed certification conditions.[36] Depending on the nature of the challenge, either a federal court or a state court may be the appropriate forum to review a § 401 certification decision.[37]

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[31] *See, e.g.*, *AES Sparrows Point LNG v. Wilson*, 589 F.3d 721, 733 (4th Cir. 2009); *Islander East Pipeline Co., LLC v. McCarthy*, 525 F.3d 141 (2d Cir. 2008).

[32] *See* COMAR 26.08.02.08(B) (designating the Lower Susquehanna as Class I-P and Class II in various segments); COMAR 26.08.02.02 (designating Class II waters as "Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting").

[33] COMAR 26.08.02.03.

[34] 33 U.S.C. § 1341(a).

[35] *Id.* § 1341(d); *see also American Rivers, Inc. v. FERC*, 129 F.3d 99, 102-111 (2d Cir. 1997) (holding that FERC did not have the authority to exclude any state § 401 certification conditions on a FERC hydropower license, and that only a court could review the legality of state-imposed certification conditions).

[36] *American Rivers, Inc. v. FERC*, 129 F.3d at 102, 112.

[37] EPA § 401 Guidance, *supra* note 9, at 31.

II. MDE SHOULD EITHER DENY CERTIFICATION OR ESTABLISH CONDITIONS ON ITS CERTIFICATION SUFFICIENT TO OFFSET PROJECT-INDUCED EFFECTS ON NUTRIENT AND SEDIMENT DISCHARGES.

A. Any § 401 certification for the Conowingo Dam Project should include conditions requiring Exelon to contribute to removal of sediment from Conowingo Reservoir.

The Conowingo Dam Project has profoundly altered the Lower Susquehanna River system. It has historically trapped an average of 50-67% of the annual sediment load (1.5 to 2 million tons),[38] along with the nitrogen and phosphorus attached to the trapped sediment. If not for the Conowingo Dam, this load would have been delivered to the Lower Susquehanna River and Chesapeake Bay at normal rates. Exelon incorrectly claims that the Conowingo Dam Project has functioned as a "best management practice" for the Chesapeake Bay, but this is an overly simplistic portrayal of the Project's effects. In fact, the Dam and its reservoir have produced an enormous artificial repository of sediment and associated nutrients that can be scoured by high flow events, re-mobilized, and delivered downstream by large storm-induced flows.[39] In fact, these scoured loads add additional pollutant loads at times when the downstream receiving waters are already vulnerable, receiving their heaviest loads of suspended pollution from the Susquehanna River Watershed.[40]

The threshold flow needed to produce scouring will be surpassed many times during the requested license period.[41] As the U.S. Geological Survey stated in a 2012 peer-reviewed report:

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[38] *See* Final Study Report: Sediment Introduction and Transport Study: RSP 3.15 (Aug. 2012) at 11, 14-15 ("FSR 3.15"), http://mde.maryland.gov/programs/Water/WetlandsandWaterways/Documents/ExelonMD/FERC/Conowingo-FRSP-3.15.pdf; *id*. at 58 tbl.3.2-1 (citing Michael J. Langland, *Bathymetry and Sediment-Storage Capacity Change in Three Reservoirs on the Lower Susquehanna River, 1996-2008* (2009) (hereafter "Langland (2009)"): sediment accumulation rate for 1996-2008 was 1.5 million tons/year; for 1959-2008 average rate was 2 million tons/year); *see also* FSR 3.15 app. F at 5 (Exelon's bathymetric survey of Conowingo Pond, estimating 1.45-1.69 tons deposited annually based on 2008-2011 average).

[39] *See* FSR 3.15 at i, 10-11; Michael J. Langland & Robert A. Hainly, *Changes in Bottom-Surface Elevations in Three Reservoirs on the Lower Susquehanna River, Pennsylvania and Maryland, Following the January 1996 Flood—Implications for Nutrient and Sediment Loads to Chesapeake Bay* (1997) (hereafter, "Langland & Hainly (1997)"); Langland (2009); Robert M. Hirsch, *Flux of Nitrogen, Phosphorus, and Suspended Sediment from the Susquehanna River Basin to the Chesapeake Bay during Tropical Storm Lee, September 2011, as an Indicator of the Effects on Reservoir Sedimentation on Water Quality* (2012) (hereafter "Hirsch (2012)").

[40] LSRWA at 78 (noting that proportion of scoured sediment loads increases with higher flows); *id*. Table 4-7 (Scour and Load Predictions for Various Flows in Conowingo Reservoir).

[41] LSRWA at 65, Table 4-3.

> The evidence presented in this report indicates that the predicted changes are not just a theoretical issue for future consideration, but are already underway. These changes in the reservoirs are already overwhelming the progress being made to reduce constituent loads from the Susquehanna River watershed. Therefore, efforts to reduce nutrient and sediment inputs to the Chesapeake Bay will need to include consideration of changes in the trapping of sediment entering, and scouring of sediment in, the reservoirs along with the management actions implemented upstream in the watershed.[42]

Thus, scoured loads deliver much greater quantities of sediment and nutrients to the Chesapeake Bay than the natural loading that would have occurred during the same flow events had the Project not been in place. Particularly in the case of very large storms – such as 25-year, 50-year, 75-year, and 100-year return interval flow events, for which there is a substantial to reasonable likelihood of occurrence during the requested license period, as discussed below – Project-induced scouring could overwhelm pollution reductions undertaken upstream in the Lower Susquehanna River watershed.

Indeed, the effects of climate change will likely lead to more frequent and severe scouring events at the Project. Over the past century or so, the Northeast (including the Chesapeake Bay region) has experienced increases in the average annual temperature, amount of precipitation, and amount of extreme precipitation events, and these trends are expected to continue and strengthen in the coming years due to climate change.[43] For example, the average temperature in the Northeast is expected to rise between 2.7 and 3 °F by 2035, between 3.6 and 4.8 °F by 2055, and between 4.7 and 8 °F by 2085, compared with the average temperature in 1971-1999.[44] In addition, the annual amount of precipitation in the Northeast is expected to increase between 2-7% in 2041-2070, compared with 1971-2000.[45] Finally, the frequency of extreme precipitation, defined as the number of days with over an inch of precipitation, is expected to increase by about 10-20% in the Chesapeake Bay watershed by 2041-2070,

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[42] Hirsch (2012) at 13.

[43] Kunkel, K. E., L. E. Stevens, S. E. Stevens, L. Sun, E. Janssen, D. Wuebbles, and J. G. Dobson, 2013: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment: Part 9. Climate of the Contiguous United States, NOAA Technical Report NESDIS 142-9, *available at* https://scenarios.globalchange.gov/sites/default/files/NOAA_NESDIS_Tech_Report_142-1-Climate_of_the_Northeast_U.S_1.pdf ("Kunkel et al."); *see also* Raymond Najjar, *Climate Change in the Northeast U.S.: Past, Present, and Future*, The Pennsylvania State University, Chesapeake Climate Projections Workshop, March 7-8, 2016, available at http://www.chesapeake.org/stac/presentations/258_Najjar%20Climate%20Chesapeake.pdf ("Najjar").

[44] Kunkel et al., *supra* note 43, at 35, 38.

[45] *Id*. at 56.

compared with 1971-2000.[46] These significant climate-related impacts must be considered by MDE during the certification process because they will likely increase the predicted levels of scouring threshold exceedances that were originally assumed for the Project.

Moreover, MDE cannot rely on the Chesapeake Bay TMDL to account for the effects of climate change, and must independently analyze the best available climate projections for the region in order to account for these additive impacts. Fundamentally, MDE has a legal obligation to consider more than mere TMDL compliance (or noncompliance) because the agency must also analyze whether the Project as a whole will interfere with the river's designated uses and narrative water quality standards under the expected climate conditions in the coming decades.[47] The Chesapeake Bay TMDL does not analyze the effects of the Conowingo dam on Maryland's state water quality standards under any conditions, much less under the projected future climate in the Northeast, and this climate analysis is an essential component of the state certification process. Furthermore, any increases in nutrient and sediment pollution from the dam due to climate change were simply not considered in the Chesapeake Bay TMDL. To the extent the dam's effects were included in the TMDL, the TMDL's assumptions about pollution levels did not account for the additive effects of climate change. In fact, only a very vague and preliminary assessment of climate change was completed for the Chesapeake Bay TMDL as a whole in 2010, due to limitations in the modeling that was available at the time.[48] Although the TMDL's "Midpoint Assessment" is expected to incorporate more up-to-date information about the impacts of climate change,[49] it remains unclear precisely how climate change impacts will change the TMDL load allocations, if at all.[50] Moreover, there are no indications the Midpoint

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[46] *Id*. at 60; *see also* Najjar, *supra* note 43, at 20-21.

[47] *See, e.g.*, 33 U.S.C. § 1341(d); *PUD No. 1 of Jefferson Co. v. Wa. Dep't of Ecology*, 511 U.S. 700 (1994) (holding that state water quality standards, including minimum stream flow requirements, should be enforced through § 401 certifications); *Anacostia Riverkeeper Inc. v. Jackson*, 798 F.Supp.2d 210, 238 (D.D.C. 2011) (holding that a state's total maximum daily loads for a water body must ensure protection of all state water quality standards, including *all* designated uses and water quality criteria, in order to satisfy the CWA); *AES Sparrows Point LNG v. Wilson*, 589 F.3d 721, 733 (4th Cir. 2009); *Islander East Pipeline Co., LLC v. McCarthy*, 525 F.3d 141 (2d Cir. 2008); *see also supra* part I.C of these comments.

[48] EPA, Chesapeake Bay TMDL, App. E, https://www.epa.gov/sites/production/files/2015-02/documents/appendix_e_climate_change_final.pdf.

[49] EPA, Chesapeake Bay TMDL 2017 Mid-Point Assessment: Guiding Principles and Options for Addressing Climate Change Considerations in the Jurisdictions' Phase III Watershed Implementation Plans (Dec. 13, 2016), http://www.chesapeakebay.net/channel_files/24456/ii.f._climate_options_for_phase_iii_wips_crwg_briefing_document_12.13.16.pdf.

[50] *See, e.g., Chesapeake Bay TMDL 2017 Midpoint Assessment Policy Options and Implementation Considerations for Addressing Climate Change in Jurisdictions' Phase III Watershed Implementation Plans* (Sept. 6, 2017) (noting that the relevant committee has not yet decided whether to change the TMDL's quantitative load allocations to account for the impacts of climate change), *available at*

Assessment will consider the impacts of climate change on the Conowingo Dam's specific effects. Therefore, MDE must complete its own, independent analysis of the effects climate change will have on the Conowingo Dam Project's impacts to Maryland's water quality standards.

For all the above reasons, we propose that any § 401 certification issued to support a renewed FERC license for the Conowingo Dam Project (1) include a detailed analysis of the effects of climate change, and (2) include conditions requiring Exelon to contribute financially to a specific plan for removing at least 4 million tons of sediment annually from the Conowingo reservoir, in order to offset the 1.5-2 million tons collected in the reservoir annually at the time the Chesapeake Bay TMDL modeling was performed, to eventually remove 100 million tons of material from the reservoir that would be vulnerable to scouring during the proposed license period, and to maintain that level thereafter. These conditions, at a minimum, would be necessary to avoid nutrient and sediment-related violations of state water quality standards as required by 33 U.S.C. § 1341(d).

B. Alternatively, the shortcomings in Exelon's application justify an outright denial of certification at this time.

In the alternative, should Maryland find that more information and study is required to support the certification conditions that we request and that are needed to protect water quality in Maryland's waters, the state should reject Exelon's § 401 Application due to its fatal deficiencies. As an initial matter, we note that Exelon's application mentions the Sediment Study it agreed to help fund in 2014, but it does not provide information on the results or the status of that study.[51] Given that the need for additional study was the primary reason given for delaying the licensing process, this is a serious omission. We and others in the public should not be required to comment on an application that is so patently incomplete. This section of our comments discuss additional deficiencies of Exelon's application.

1. Exelon over-relies on the Lower Susquehanna River Watershed Assessment, despite serious shortcomings.

Exelon's Application relies heavily on the Lower Susquehanna River Watershed Assessment ("LSRWA"), an inter-agency project led by the U.S. Army Corps of Engineers ("Corps") and the U.S. Geological Survey ("USGS") to assess the effects of sediment and nutrient discharges from the three dams located on the Lower Susquehanna River – Holtwood, Safe Harbor, and Conowingo.[52] As long ago as September 2014, Exelon was aware of three

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https://www.chesapeakebay.net/channel_files/25446/mpa_climate_change_policy_option_briefing_memo_wqgit_090617.pdf.

[51] § 401 Application at 2 ("…in December 2014, Exelon entered into an agreement with MDE to work with state agencies in Maryland, 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 to design and conduct a multi-year Sediment Study to provide additional information to MDE.")

[52] LSRWA, *supra* note 4.

significant shortcomings in the LSRWA, identified in our comments on FERC's Draft Environmental Impact Statement ("DEIS"): (1) it did not model the effects of a potential project-induced scouring event for a large-magnitude storm (*e.g.* 984,000 cubic feet per second ("cfs")), for which there is a reasonable chance of occurrence during the license period; (2) it did not sufficiently evaluate the effects of project-induced scouring on submerged aquatic vegetation ("SAV") and; (3) it did not adequately evaluate the effect of additional nutrient loading caused by project-induced scouring.[53]

In addition, today we submit with these comments our independent third-party review of the LSRWA ("LSRWA Review").[54] As discussed separately in Section III, below, the Review confirms our prior observations that the LSRWA modeling effort was undermined by unjustified and questionable assumptions, as well as important omissions, which caused the LSRWA modelers to underestimate potentially catastrophic effects of project-induced scouring on nutrient and sediment discharges to the Chesapeake Bay.

Exelon relies heavily on both the LSRWA and FERC's DEIS as support for its claim that the adverse water quality effects of the ongoing operation of the Conowingo Dam facility need not be offset by conditions in Maryland's § 401 certification, yet Exelon failed to address or overcome any of the errors or omissions in the LSRWA and DEIS. For this reason alone, Maryland is justified in denying the certification.

2. Exelon's application for a § 401 certification over-relies on the Chesapeake Bay TMDL, yet it badly mischaracterizes the analyses, assumptions, and requirements of the Chesapeake Bay TMDL.

Exelon's application mischaracterizes the *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (Dec. 29, 2010) ("Chesapeake Bay TMDL"), incorrectly claiming that it provides a "comprehensive framework" for addressing "any impacts resulting from the reduction in trapping capacity behind Conowingo Dam caused by sediment introduced upstream of Conowingo Dam." [55] This assertion can be readily dismissed, given that the U.S. Environmental Protection Agency ("EPA") expressly declined to include a wasteload allocation in the Chesapeake Bay TMDL to account for scoured-sediment and nutrient discharges from the Conowingo Dam Project.[56] This decision was based on the incorrect assumption that the Conowingo reservoir had not yet reached dynamic equilibrium (the point "after which the

[53] Comments of Stewards of the Lower Susquehanna, the Lower Susquehanna Riverkeeper, and Waterkeepers Chesapeake on Draft Multi-Project Environmental Impact Statement for Hydropower Licenses: Susquehanna Hydroelectric Projects (FERC Project No. 405-106, Sept. 29, 2014), Accession No. 20140929-5322.

[54] Paul Frank, P.E., FlowWest, Lower Susquehanna River Watershed Assessment Review (August 25, 2017), enclosed as Attachment A.

[55] Exelon Application at 3.

[56] Chesapeake Bay TMDL, Appx. T at T-2, T-5.

amount of sediment flowing into the reservoir equals the amount leaving the reservoir, and the stored volume of sediment is relatively static") and would not until after 2025.[57]

Exelon further incorrectly claims that EPA "recognized that sediment-related pollution impacts… need to be addressed directly without reliance on Conowingo Dam."[58] EPA said no such thing. It simply assumed that the Conowingo reservoir would have "trapping capacity" through 2025, and promised to revisit Pennsylvania's, Maryland's, and New York's "2-year milestones" under the TMDL if that assumption proved to be incorrect.[59]

In any event, Exelon's Application contains no evidence that reductions to ongoing pollution discharges into the Conowingo Dam reservoir from elsewhere in the watershed are capable of preventing, much less offsetting, discharges of scoured sediments and nutrients that are already concentrated in the reservoir due to the presence of the facility since 1928, and that are already liable to be discharged during flow events that exceed the scouring threshold. As long ago as 2012, the USGS noted an observed rise in the flux of total phosphorus at Conowingo, supporting the "hypothesis that this rise is caused by the filling of the reservoir, resulting in a decrease in deposition at moderate flows and a decrease in the threshold of flow required to cause scour of the reservoir sediments."[60] Whereas previous estimates had placed the scour threshold for Conowingo Pond at around 400,000 cfs, the 2012 USGS study supported an updated estimate of 175,000–300,000 cfs.[61] Based on historic flows, we can expect to see the scour threshold exceeded many times during the proposed license period.

III. MARYLAND CANNOT RELY ON THE LSRWA BECAUSE OF ITS SERIOUS SHORTCOMINGS

The LSRWA used a "daisy chain" of models to produce estimates and make predictions about future conditions related to the Conowingo Dam Project's sediment discharges, with output from one model fed into the next model in the series.[62] At each stage, the modelers made choices that resulted in under-estimations of sediment quantities and therefore underrepresented potential sediment impacts and associated nutrient impacts on the Chesapeake Bay. As a result, Maryland cannot rely on the flawed analysis and findings of the LSRWA.

This section summarizes three particular flaws in the LSRWA: (1) the modelers did not evaluate larger-sized storms for which there is a reasonable chance of occurrence during the license period; (2) for those flow events that were modeled, the modelers used a fatally-flawed

[57] *Id*. at T-1 to T-2.

[58] Exelon Application at 19.

[59] Chesapeake Bay TMDL, Appx. T at T-5 ("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 based on the new delivered loads.").

[60] Hirsch (2012) at 10.

[61] *Id*. at 12.

[62] LSRWA Review at 12.

approach that likely substantially underestimated the effects of those flows on sediment discharges; and (3) the modelers did not properly evaluate the effects of sediment and nutrients during the SAV growing season. These flaws are discussed in greater detail in the enclosed LSRWA Review.

A. The LSRWA modelers did not model a 25-year, 50-year, 75-year, or 100-year return interval flow event, which have a high to reasonable chance of occurring during the license period.

Exelon is requesting a 50-year operating license. The following table sets forth the approximate chance that a particular return interval flow event will occur during a given 50-year period, and it demonstrates there is a reasonable chance that such storm events will occur during the license period.

Return interval flow event	**Percentage chance of occurring in a given 50-yr. period**[63]
100-year	40%
75-year	49%
50-year	63%
25-year	87%
20-year	92%

The LSRWA modeled flow events representing only an approximately 20-year return interval flow event. In particular, the modelers depicted Tropical Storm Lee, an approximately 20-year return interval flow event.[64] The modelers also set out to depict a high-flow event that occurred in January 1996 (for which the peak flow represented approximately a 25-50 year return interval flow event), but because of errors discussed in section III.B below, the resulting analysis was approximately equivalent to evaluating a 20-year return interval flow event, similar to Tropical Storm Lee.

The decision not to model and study the effects of a larger return interval flow event was a serious omission in the LSRWA. Because the relationship between sediment concentration and flow is exponential (as detailed below), a 50-year, 75-year or 100-year return interval flow event would have produced sediment scouring effects substantially greater than storms modeled by the LSRWA modelers. Since such storms are likely to occur during the license period, Maryland lacks the sort of analysis that would be necessary to estimate the project-induced effects that must be offset by conditions in the § 401 certification.

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[63] National Oceanic and Atmospheric Administration, National Weather Service, Flood Return Period Calculator, https://www.weather.gov/epz/wxcalc_floodperiod. *See also* LSRWA Review at 8.

[64] *Id*. at 2, 5-7.

B. The LSRWA modelers underestimated the effects of the flow events they modeled by using *averages* to represent peak flow conditions and associated sediment concentrations.

Both the USGS and the Corps' models represented "peak" Tropical Storm Lee conditions based on *daily average flow* rather than using other methods of calculating peak conditions, a choice that caused the LSRWA to underrepresent the storm's effects.[65] In particular, while the highest daily average flow recorded during Tropical Storm Lee was 709,000 cfs, the highest *24-hour running average flow* was 746,000 cfs, and the highest *instantaneous flow* was 778,000 cfs. Similarly, for one part of their analysis the Corps modelers represented Tropical Storm Lee by its *storm average flow*, which was just 632,000 cfs. These choices likely explain why the models predicted sediment quantities that were lower than the best available estimates or actual measured data suggested.[66]

While the modelers at least recognized that their model outputs constituted underestimations, they chose to respond by increasing the assumed inflow load by 10%.[67] As discussed in more detail in the LSRWA Review, simply increasing the modeled loads by a mere 10% was unjustified and likely did little to improve the validity of the modeling.[68]

The LSRWA analysis also involved modeling of the January 1996 high-flow event, but the modelers represented that storm based on daily average flows rather than instantaneous flows.[69] While use of the *daily average* measure meant that the modelers considered the January 1996 flow event as having a peak of 622,000 cfs, the *instantaneous flows* (measured in 15-minute increments) peaked at 909,000 cfs.[70] As a result, the modeling for the January 1996 event represented something closer to a 20-year return interval flow event, similar to Tropical Storm Lee and significantly smaller than the high-flow events reasonably likely to occur during the requested license period.

The consequences of these choices were substantial because the relationship between flow and transport of sediment is an exponential, not linear, relationship.[71] Had the LSRWA modelers represented these storms using a more appropriate measure of peak flows, because of the exponential relationship they would certainly have predicted much greater sediment and nutrient effects. Instead, the LSRWA models presented an unjustified rosy picture of the likely effects of future high-flow events.

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[65] *Id*. at 1-2.

[66] *Id*. at 2-6, 12.

[67] *Id*. at 4.

[68] *Id*. at 4-5.

[69] *Id*. at 7.

[70] *Id*.

[71] *Id*. at 6 (citing Scott and Sharp, USGS, Sediment Transport Characteristics of Conowingo Reservoir at 19, fig.6 (Feb. 2014)).

C. The LSRWA modelers did not properly evaluate the effects of a large flow event on the SAV growing season.

The LSRWA modeling considered the effects of sediment discharges to the Chesapeake Bay during the months of January, June, and October. The modelers made this choice despite the fact that the 1967-2013 historic flow record shows there were more days at or above the scouring threshold during March, April, and May than all other remaining months.[72] As a result, the SAV growing season was largely excluded from the analysis.

CONCLUSION

As the foregoing discussion and attached supporting information demonstrates, Exelon's Application for a § 401 water quality certification cannot be issued unless Maryland imposes a requirement for the company to participate as a financial partner in a specific plan for removing a minimum of 4 million tons of sediment from Conowingo reservoir annually until 100 million tons are removed, and for maintaining the same level thereafter. If Maryland concludes that it lacks sufficient information at this time – a conclusion that is well justified given the shortcomings of the analyses discussed in this letter – Maryland should deny the certification outright. In either case, Maryland must preliminarily complete a detailed analysis of the effects of climate change in order to accurately assess the impacts the Project will have on the state's water quality standards.

We request an opportunity to meet with you and your staff to discuss these comments. If there are any questions or you would like to set a time to meet, please contact Jennifer Chavez at jchavez@earthjustice.org or by phone at 202-667-4500, ext. 5208.

Sincerely,

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[72] *Id*. at 9-10.

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Enclosure