UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

In the Matter of	)	
	)	Project No. 405-106
Exelon Generating Company, LLC	)	

COMMENTS OF STEWARDS OF THE LOWER SUSQUEHANNA, THE LOWER SUSEQUEHANNA RIVERKEEPER, AND WATERKEEPERS CHESAPEAKE

Pursuant to 18 C.F.R. § 4.34(b)(3), Stewards of the Lower Susquehanna, Inc., ("SOLS"), the Lower Susquehanna Riverkeeper ("Riverkeeper"), and Waterkeepers Chesapeake (collectively, "SOLS et al.") file comments in this proceeding, which addresses the relicensing of Exelon Generation Company, LLC's Conowingo Hydroelectric Project. The Conowingo Hydroelectric Project (also, "Conowingo Dam" or "Dam") dams the Susquehanna River about 10 miles upstream of the river's outlet to the Chesapeake Bay. As discussed below, Exelon's Final License Application is sorely lacking in three areas of particular concern for SOLS et al., and the Commission must not grant Exelon its requested license without including stronger protections for the affected waters, fish, and recreational opportunities than Exelon proposes.

INTRODUCTION

The comments that follow focus on three particular issues of concern: ongoing blockage of migrating American eel, scouring of accumulated sediment and nutrients from the reservoir created by Conowingo Dam that threaten water quality restoration efforts in the Chesapeake Bay, and the closure of recreational access to the dam's catwalk.

SOLS et al. filed their motion to intervene in this proceeding on July 17, 2013.[1] No one filed an opposition. Under FERC's regulations, SOLS et al. are thus parties.[2] SOLS is a non-profit environmental advocacy organization headquartered in Wrightsville, Pennsylvania. Established in 2005, SOLS has more than 100 individual and organization members, and its mission is to protect and improve the ecological and aesthetic integrity of the Lower Susquehanna Watershed and Chesapeake Bay. The Lower Susquehanna Riverkeeper leads SOLS' work in advocating for strong environmental standards and policies that protect and serve the public interest.

Waterkeepers Chesapeake is a coalition of 18 independent Waterkeeper programs operating throughout the Chesapeake and Delmarva Coastal Bays Watersheds.[3] The coalition works to protect and improve the health of the Chesapeake Bay and the waterways in the region, including the Lower Susquehanna. Waterkeepers Chesapeake aims to amplify the voices of the individual Waterkeeper groups, and to work together on campaigns to stop pollution throughout the region that affects the Chesapeake.

SOLS and the Lower Susquehanna Riverkeeper's geographic focus begins at the Susquehanna River's confluence with the West Branch at Sunbury, Pennsylvania, and reaches downstream to the Chesapeake Bay at Havre de Grace, Maryland. In total, the territory stewarded by SOLS and the Riverkeeper encompasses over 140 miles of the

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[1] SOLS et al., Mot. to Intervene (FERC Accession No. 20130717-5187, July 17, 2013).

[2] 18 C.F.R. § 385.214(c)(1).

[3] The members are Anacostia Riverkeeper, Assateague Coastkeeper, Baltimore Harbor Waterkeeper, Chester Riverkeeper, Choptank Riverkeeper, Gunpowder Riverkeeper, Lower James Riverkeeper, Lower Susquehanna Riverkeeper, Miles-Wye Riverkeeper, Patuxent Riverkeeper, Potomac Riverkeeper, Sassafras Riverkeeper, Severn Riverkeeper, Shenandoah Riverkeeper, South Riverkeeper, Upper James Riverkeeper, Virginia Eastern Shorekeeper, and West/Rhode Riverkeeper. They are themselves membership organizations dedicated to protecting and enhancing their watersheds' environment and their members' enjoyment of it.

Susquehanna River and approximately 9,200 square miles in the Lower Susquehanna sub-basin, including the area immediately around the Dam. Waterkeepers Chesapeake's geographic sweep includes the Lower Susquehanna River watershed, as well as the Chesapeake and Coastal Bays and their tributaries and shorelines.

ISSUES AND RECOMMENDATIONS

I. VOLITIONAL UP- AND DOWNSTREAM PASSAGE FOR AMERICAN EEL IS NECESSARY.

The Final License Application and its supporting reports do not provide either an adequate solution for restoring the American eel to the Susquehanna River or an adequate analysis of how to do so. An adequate solution would build on the beginning steps Exelon, the U.S. Fish and Wildlife Service, and others have taken to study where upstream American eel passage facilities might be most effectively located and how to promote downstream passage that best achieves resource management goals. Such a solution must include permanent volitional American eel passage both upstream and downstream, with an initial interim phase of upstream trap and transport to hasten restoration of eel (and the biota it supports) to robust levels throughout their historic range in the Susquehanna River basin, which would benefit both the larger American eel population and the Lower Susquehanna River watershed. The Commission should not accept Exelon's proposal for providing only trap and transport of American eel both up- and downstream, which is based on anemic analysis.

A. Exelon Must Make Physical and Operational Changes at Conowingo Dam to Help Restore and Maintain American Eel in the Susquehanna River Basin.

1. Conowingo Dam Is a Key Impediment to Returning American Eel in a Sustainable Way to Its Native Range in the Susquehanna River.

At present, as Exelon recognizes, Conowingo Dam effectively blocks American eel from traveling farther than 10 miles upstream on the Susquehanna.[4] Before hydroelectric dam development on the Susquehanna River, the Susquehanna River was "the largest and most productive … American eel producing river on the Atlantic Coast."[5] The Susquehanna used to support over 11 million American eel more than it does today, and eel were "abundant" and "numerous."[6] Indeed, American eel are estimated to have made up "almost 25% of the fish biomass in most Atlantic slope streams and rivers," like the Susquehanna and its tributaries.[7]

The absence of American eel is harmful to the Susquehanna River and Chesapeake Bay ecosystems and water quality, as well as to the eel, which has been

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[4] 1 Application for New License for Major Water Power Project—Existing Dam: Conowingo Hydroelctric [*sic*] Project, at E-162 (FERC Accession No. 20120831-5024) [hereinafter FLA].

[5] Susquehanna River Anadromous Fish Restoration Cooperative (SRAFRC), *Migratory Fish Management and Restoration Plan for the Susquehanna River Basin* 12 (2010) [hereinafter SRAFRC, *Restoration Plan*].

[6] *American Eel – Past, Present, and Future*, MBSS Newsletter: An Eye on Maryland Streams (Md. Dep't of Natural Res., Annapolis, Md.), Mar. 1999, https://web.archive.org/web/20120511125444/http://www.dnr.state.md.us/streams/news/march99/eel.html [hereinafter MDNR, *American Eel*]; *accord, e.g.*, Steve Minkkinen & Ian Park, U.S. Fish & Wildlife Serv. ("FWS"), *American Eel Sampling at Conowingo Dam 2008*, at 1 (2008), http://www.fws.gov/northeast/marylandfisheries/reports/SRAFRC%202008.pdf [hereinafter Minkkinen & Park, *2008 Eel Sampling*]; SRAFRC, *Restoration Plan*, *supra*, at 9-11 (summarizing late-19th and early-20th century fishery reports).

[7] FWS, *Experimental Stocking of American Eels in the Susquehanna River Watershed: 2011 Annual Report* (pdf p.) 2 (n.d.), http://www.fws.gov/northeast/marylandfisheries/reports/2011%20Sunbury%20Mitigation%20Annual%20Report%20FINAL.pdf [hereinafter FWS, *2011 Eel Stocking Report*]; *accord* Atl. States Marine Fisheries Comm'n ("ASMFC"), *Addendum III to the Fishery Management Plan for American Eel* 2 (2013) [hereinafter ASMFC, *Addendum III*].

blocked from thousands of miles of prime habitat.[8] Eel are an apex predator in many streams, and, especially when young, they also serve as prey for other predatory fish and birds.[9] Also, because upon reaching 8-24 years old,[10] adult American eel migrate out from the rivers in which they spend the bulk of their lives and die in the Atlantic Ocean, they serve to transport nutrients out from rivers into the ocean, thus likely helping alleviate nutrient overloading in rivers and near-shore waters, like the Susquehanna River and Chesapeake Bay.[11]

Further, recent published research demonstrates that American eel are the best host species for the glochidia (the larvae) of the Eastern elliptio freshwater mussel, historically abundant in the Susquehanna.[12] These mussels are effective natural filters of river water.[13] They are prevalent in other rivers that are not dammed, like the Delaware, but they are not nearly as common in the Susquehanna.[14] The presence of more American eel, and in turn more elliptio mussels, in the Susquehanna equates to better water quality

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[8] SRAFRC, *American Eel Restoration Plan for the Susquehanna River Basin* 3-4 (2013) [hereinafter SRAFRC, *American Eel Addendum*].

[9] ASMFC, *Addendum III*, *supra*, at 2; SRAFRC, *Restoration Plan*, *supra*, at 107 (responding to comment by Exelon).

[10] ASMFC, *Addendum III*, *supra*, at 1, says "silvering," which culminates in migration, can begin with American eels of 3-24 years, with males silvering younger, and silvering occurring later the farther north the eel lives. *See also* ASMFC, Fishery Mgmt. Rep. No. 36, *Interstate Fishery Management Plan for American Eel (*Anguilla rostrata*)* 9-10 (2000). ASMFC, *American Eel*, http://www.asmfc.org/species/american-eel (last visited Dec. 9, 2013), says 8 to 24+ years. SRAFRC, *Restoration Plan*, *supra*, at 33, notes that eel "mature slowly, requiring 7 to 30+ years to attain sexual maturity." We use the 8-24 year range, but note that it could be longer.

[11] *See, e.g.*, MDNR, *American Eel*, *supra*.

[12] William A. Lellis *et al.*, *Newly Documented Host Fishes for the Eastern Elliptio Mussel* Elliptio complanata, 4 J. Fish & Wildlife Mgmt. 75, 79 (2013).

[13] FWS, *2011 Eel Stocking Report*, *supra*, at 3.

[14] *Id.*

in the Susquehanna watershed.[15] The mussel restoration made possible by large-scale American eel restoration would likely provide a major benefit for Susquehanna River—and Chesapeake Bay—water quality. Each mussel can filter 7-21 gallons of water per day and remove sediment from it before it reaches the Chesapeake, and lives about 50 years.[16] Because the Susquehanna River is longer than the Delaware, and its river basin contains more than twice the miles of waterways,[17] it likely could support even more mussels, filtering even more water. Accordingly, a restored population of elliptio mussels would provide significant filtration benefits for the Susquehanna River and the Chesapeake Bay.[18]

Thus, by blocking eel from access to the vast majority of the Susquehanna River basin, Conowingo Dam harms American eel, as well as the broader Susquehanna and Chesapeake ecosystems and water quality.

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[15] *See generally* Karl Blankenship, *Demise of Eels May Have Doomed Susquehanna Mussels, Hurt Bay*, Bay Journal (July 1, 2006), http://www.bayjournal.com/article/demise_of_eels_may_have_doomed_susquehanna_mussels_hurt_bay (discussing differences between elliptio populations in Delaware and Susquehanna Rivers, elliptio filtration capacity, and role of eel as host to mussel larvae).

[16] *See* FWS, *2011 Eel Stocking Report*, *supra*, at 3 ("the estimated 280 million eastern elliptio in the Delaware River have the potential to filter 2 billion to 6 billion gallons of water … each day (Spooner and Lellis 2010)."); E-mail from Danielle Kreeger, Partnership for the Delaware Estuary, to Michael Helfrich (Jan. 28, 2014, 14:51 EST) (estimating summer filtration rate to be 1 liter/hour).

[17] *Compare* Susquehanna River Basin Comm'n, *Information Sheet* 1 (May 2013), http://www.srbc.net/pubinfo/docs/Susq%20River%20Basin%20General%20(05-13).PDF (Susquehanna River is 444 miles long and the basin contains more than 49,000 miles of waterways), *with* Del. River Basin Comm'n, *Basin Information* (Feb. 27, 2013), http://www.state.nj.us/drbc/basin/ (Delaware River is 330 miles long from joining of its east and west branches), *and* Philadelphia Water Department, *Delaware* (last visited Dec. 10, 2013), http://www.phillywatersheds.org/your_watershed/Delaware ("The Delaware River Watershed contains approximately 23,700 linear miles of streams.").

[18] SRAFRC, *American Eel Addendum*, *supra*, at 3 ("Freshwater mussels have the ability to filter large quantities of water … and have the potential to improve water quality in the Susquehanna River …. Restoring American Eels to the watershed may also accrue indirect benefits to the ecosystem by supporting functioning, reproducing mussel populations ….").

Moreover, Conowingo Dam, in conjunction with the three other hydroelectric facilities on the Lower Susquehanna's main stem, serves as an effective barrier against downstream migration of adult American eels. Adult eel often are subject to harm, including death, from passing through hydroelectric turbines.[19] FWS began stocking significant numbers of juvenile eel upstream in 2008, and the amount of eel it has transported upstream has grown significantly over time, from 17,000 eels in 2008 to over 275,000 in 2013.[20] Beginning in 2016, those eels will begin maturing in increasing numbers, resulting in the need to provide downstream passage past all the main-stem dams then or shortly thereafter.[21]

2. FERC Can and Should Require Exelon to Achieve Consistency With Existing Comprehensive Plans That Call for Eel Restoration and Maintenance.

A number of FERC-recognized comprehensive and other plans call for the enhancement and restoration of American eel populations in rivers such as the Susquehanna, including providing upstream access for young eel and downstream passage for mature eel, and for information-gathering on eel so as to protect and enhance

[19] *E.g.*, ASMFC, *Addendum III*, *supra*, app.II at 19.

[20] *Compare* SRAFRC, *Restoration Plan*, *supra*, at 84 tbl.5 (17,000 eels transported annually in 2008 and 2009 from Maryland to Pennsylvania waters of the Susquehanna), *and* Final Study Report: Biological and Engineering Studies of American Eel: RSP 3.3, at 22 (FERC Accession No. 20120831-5011) [hereinafter Final Eel Engineering Report] (17,500 eels transported upstream from being caught at Conowingo Dam in 2010), *with* Final Study Report: Biological and Engineering Studies of American Eel at Conowingo Project: 2011 Eel Sampling Below Conowingo Dam: RSP 3.3, at 9 (FERC Accession No. 20120831-5011) [hereinafter Final Eel Sampling Report] (62,500 eels transported upstream from being caught at Conowingo Dam in 2011), *and* Steve Minkkinen & Ian Park, FWS, *American Eel Sampling at Conowingo Dam 2012*, at 3 (2013) (96,000 eels transported upstream from being caught at Conowingo Dam in 2012), *and* SRAFRC, *American Eel Addendum*, *supra*, at 15 tbl.4 (reporting over 275,000 eels transported upstream from being caught at Conowingo Dam in 2013).

[21] Moreover, some eels may remain from earlier stocking programs. *See* FLA, *supra*, at E-121, -162 (discussing former stocking program); SRAFRC, *Restoration Plan*, *supra*, at 84 tbl.5 (summarizing former stocking program and early years of current program).

fish, wildlife, and ecosystems that depend on eel.[22] The SRAFRC's *Restoration Plan*'s goal is particularly relevant: "Restore self-sustaining, robust, and productive stocks of migratory fish capable of producing sustainable fisheries, to the Susquehanna River Basin throughout their historic ranges in Maryland, Pennsylvania, and New York."[23] Among the eel-specific and Susquehanna River-specific goals are:

- "Develop and implement upstream passage plans at FERC-licensed dams to ensure adequate passage of American eels."
- Also for upstream passage, "Recommend or conduct evaluation studies as necessary. Report eel passage results annually."
- "Develop and implement downstream passage plans and performance measures for silver eels at FERC-licensed dams to ensure at least 85 percent survival at each hydroelectric development."
- "Establish operational measures at all FERC hydroelectric projects, [sic] to ensure survival of silver eels passing downstream."
- "Implement trap and transport of eels from the lower river to upstream sites while eel passageways are being constructed and evaluated."
- "Monitor abundance of American eels at priority passage barriers. Monitor relative abundance at these sites to determine appropriate siting for eel passage."[24]

Similarly, SRAFRC's *American Eel Addendum* adds to the *Restoration Plan*'s goal, as well as establishing specific objectives and tasks. It sets as its "goal"

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[22] *E.g.*, SRAFRC, *American Eel Addendum*, *supra*, at 5; SRAFRC, *Restoration Plan*, *supra*, at 37-38; ASMFC, Fishery Mgmt. Rep. No. 36, *Interstate Fishery Management Plan for American Eel (*Anguilla rostrata*)*, at iv (2000); ASMFC, *Addendum III*, *supra*, at 2. *See also* FERC, *List of Comprehensive Plans: December 2013*, http://www.ferc.gov/industries/hydropower/gen-info/licensing/complan.pdf (listing, *inter alia*, ASMFC eel fishery management plan, SRAFRC, *American Eel Addendum*, and SRAFRC, *Restoration Plan*).

The FERC list of plans attributes SRAFRC, *Restoration Plan*, to the U.S. Fish and Wildlife Service. *E.g.*, FERC, *List of Comprehensive Plans*, *supra*, at 37. Exelon made an internally incoherent error in denying that "Migratory Fish Management and Restoration Plan for the Susquehanna River Basin" is a FERC-acknowledged comprehensive plan. *Compare* FLA, *supra*, at E-375, E-384 (enumerating SRAFRC, *Restoration Plan*, as FERC-acknowledged comprehensive plan as of April 2011), *with id.* ex.E app.A at 14 (claiming that "The Migratory Fish Management and Restoration Plan for the Susquehanna River Basin is not currently listed as a comprehensive plan by FERC" as of April 2012).

[23] SRAFRC, *Restoration Plan*, *supra*, at 35.

[24] SRAFRC, *Restoration Plan*, *supra*, at 37, 48, 51.

> to ensure that every American Eel that approaches Conowingo Dam is passed upstream into the Susquehanna River Basin in order to restore American Eels to the watershed, to provide a net increase of out-migrating American Eel, and restore the ecosystem functions provided by healthy American Eel populations, including their role as predator and prey as well as acting as hosts for the glochidia of *E. complanata*.[25]

The *Addendum* also establishes objectives, including to "[e]nsure upstream passage of American Eel throughout the Susquehanna River Basin" and to "[i]ncrease survival and escapement of American Eels passing … hydroelectric facilities during their downstream spawning migration."[26] It calls for an upstream trap and transport program, with trapping facilities on the west bank of the Susquehanna and near the East Fish Lift (or another appropriate location).[27] Stocking should occur "<u>throughout</u> the Susquehanna River and/or its tributaries … inclusive of <u>all</u> suitable waters above Conowingo Dam," not merely above York Haven Dam.[28] Notably, the upstream trap and transport program is not a permanent solution; the *Addendum* calls for development of passage plans, including at Conowingo Dam.[29] Further, for downstream passage, the *Addendum* calls for "ensur[ing] at least 85 percent survival" at Conowingo Dam.[30] These goals can be accomplished along with Exelon's power-production goals.

Accordingly, to best meet the Commission's responsibilities under 16 U.S.C. §§ 797(e), 803(a), the new license for Conowingo Dam must provide for volitional

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[25] SRAFRC, *American Eel Addendum*, *supra*, at 5.

[26] *Id.*

[27] *Id.* at 5-6.

[28] *Id.* (emphasis added).

[29] *See id.*

[30] *Id.* at 7.

upstream and downstream passage, with interim trap and transport for upstream passage while volitional passage is designed and constructed. Effective downstream passage must be in place in time to allow outmigration of significant numbers of eels that are already upstream. Further, the volitional passage must be effective and meet quantified goals, where available.

SOLS et al. call for FERC to require Conowingo Dam to allow for the establishment and maintenance of an American eel population of 11 million, as there was before large hydropower development began on the Susquehanna, by allowing all eels that arrive at eel ladders or the interim trap-and-transport facilities to pass the Dam. It is reasonable to estimate that an average of 1 million eels per year would avail themselves of this opportunity. Historical catch totals indicate this is an attainable goal.[31] The annually increasing present-day catch just from the west bank of Conowingo Dam further suggests that hundreds of thousands of eels seek to pass the Dam each year.[32]

B. Permanent Volitional Up- and Downstream Passage Facilities, with Performance Goals and Mandatory Reporting, Are Critical to Eel Restoration.

Exelon's trap and transport-only proposal must be rejected based on biological and functional considerations. Instead, the Commission should include license conditions that require permanent volitional upstream and downstream passage for American eel at Conowingo Dam.[33] The biological effects of volitional upstream migration are not fully

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[31] *See* SRAFRC, *Restoration Plan*, *supra*, at 84 tbl.5 (of 17 years reported before 2008, average number of eels transported from Maryland to Pennsylvania waters of Susquehanna was 1.014 million).

[32] *See supra* p.7 & n.20; E-mail from Steve Minkkinen, FWS, to Seth Johnson (Dec. 11, 2013, 10:07 EST) (attached) (reporting catching over 400,000 eels at Conowingo Dam in 2013).

[33] *See* SRAFRC, *American Eel Addendum*, *supra*, at 5-6 (calling for continuing and expanding current trap and transport program at Conowingo Dam as well as developing and implementing upstream passage plan at Conowingo Dam).

known, but what is known suggests that volitional migration may be helpful for promoting development of female eels, while trap and transport may harm the development of females.[34] This is important because female eels are especially instrumental in maintaining the overall population of eel.[35] When they enter fresh water, eels are sexually undifferentiated.[36] They develop into males or females before migrating back to sea, with "gender [being] determined principally by environmental factors."[37] Changes to these conditions, "in particular reducing eel density and limiting interference and social stress, may also promote the development of females."[38] Thus, the stress and densities involved in trap and transport may cause the freshwater population to be male-dominated. Exelon proposes to exacerbate the problem because it would only transport the eel to a few locations.[39] Exelon thus proposes to accomplish the opposite of the natural order of eel sex determination in freshwater habitat. Accordingly, volitional passage is the only means by which the American eel will ultimately maintain biological integrity during passage up into the watershed.

In addition, on a long-term basis, it appears that volitional upstream passage will be more cost-effective than a permanent trap-and-transport program. Exelon's cost estimates show that a volitional passage facility on the west bank of the river would have

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[34] *See* Final Eel Engineering Report, *supra*, at 16 (noting study finding more female eels farther upstream).

[35] *See* SRAFRC, *Restoration Plan*, *supra*, at 97 (noting that female eels bear up to 20 million eggs each). *See generally* SRAFRC, *American Eel Addendum*, *supra*, at 3-4 (describing how restoring eel upstream can help eel and ecosystem).

[36] Andrew J.H. Davey & Donald J. Jellyman, *Sex Determination in Freshwater Eels and Management Options for Manipulation of Sex*, 15 Reviews in Fish Biology and Fisheries 37, 38 (2005).

[37] *Id.* at 37.

[38] *Id.* at 38.

[39] *See* FLA, *supra*, at E-152 (proposing upstream trap and transport facility "with transported eels released in small tributaries (approximately 50 feet wide) upstream of York Haven Dam that were previously stocked by" FWS).

a capital cost of approximately $1,695,000 or $2,230,000, with annual operating costs of $200,000 per year.[40] The capital cost for a trap and transport facility on the west bank would be $639,000, with annual operating costs of $585,000 per year.[41] Thus, the difference in one-time capital costs is $1,056,000 or $1,591,000. The difference in annual operating costs is $385,000. Upstream volitional passage would thus begin saving money over trap and transport in 3-5 years.[42]

As for downstream passage, upon full restoration of the American eel to its historic habitat in the Susquehanna watershed, 11 million eels will again call these waterways home until they are ready to migrate to the Sargasso Sea. The number migrating out in any given year will be significant. As an illustrative, albeit oversimplified, example, the table below shows that with 1,000,000 eels traveling upstream per year, the number of out-migrating eels rapidly grows after 9 years to over 100,000 out-migrating eels, and over 200,000 at 11 years.[43] SOLS et al. submits that no

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[40] Final Eel Engineering Report, *supra*, at v tbl.ES-2 (2011 dollars).

[41] *Id.* (2011 dollars); *see also* FLA, *supra*, at D-5 tbl.4.5-1 (capital cost of $718,000 in 2014 dollars; average annual cost of $645,000 per year). We note that Exelon is inconsistent about calculating its overall estimated costs for environmental and recreation measures. At first, Exelon does not include its costs for preparing a new license application, leaving its capital costs at $5,413,000 and total operational and maintenance costs at $54,955,000, for a total of $60,368,000, over the term of the license. FLA, *supra*, at D-5 tbl.4.5-1. It later adds in the costs for preparing a new license application as a new capital cost of $14,989,000, increasing its overall costs to $75,357,000. *Id.* at E-372 tbl.4.1.4-1. Exelon's preparation of a new license application is not an environmental or recreation measure, and FERC should not countenance Exelon's attempt to pass it off as one.

[42] Exelon does not provide any examination, including a cost estimate, for any facilities on the east side of the tailrace. Instead, Exelon provided estimates for facilities on the east side of the spillway. Accordingly, SOLS et al. are unable to provide a quantitative analysis of the costs of volitional passage versus the costs of trap and transport. But, so long as the total annual operating cost for two volitional eel passage facilities, one on each side of the tailrace, remains below the total annual operating cost for however many trap and transport facilities Exelon would otherwise construct, however, the essence of our analysis also remains valid: only the payback period would change.

[43] The table is based on 1,000,000 per year migrating in, and a 6.25% annual outmigration factor starting at the 8th year, based on eel maturation occurring between years 8 and 24. The population equation is:

footnote continued on next page…

feasible downstream trap and transport program could fulfill this need, even assuming adequate eel capture facilities could be constructed, maintained, and operated. Accordingly, downstream volitional passage is the only viable solution.

Year	Population	Number Migrating Out
1	0+1,000,000=1,000,000	0
…	…	…
4	3,000,000+1,000,000=4,000,000	0
…	…	…
8	7,000,000+1,000,000–(.0625x1,000,000)= 7,937,500	62,500
9	7,937,500+1,000,000–(.0625x(2,000,000-62,500))=8,816,406	121,094
10	…=9,640,381	176,025
11	…=10,412,857	227,524
12	…=11,137,053	275,804

In sum, on upstream passage, volitional passage is the better option for providing permanent eel passage both from an ecological and a cost perspective. Because more eel are present at the west bank of the river, as opposed to locations in the spillway, one eel passage should be located on the west bank.[44] Eel passage should not be constructed in

…footnote continued

> Population of eels in watershed + annual stocking – mature eels migrating out (OMpop) = Next year's population

The number migrating out equation is:

> Annual out-migration factor x (number in mature year classes – eels that migrated previously)

[44] *See* Final Eel Engineering Report, *supra*, at iii; FLA, *supra*, at E-152 (proposing to construct trap and transport facility on west bank because of higher catch-rate there); SRAFRC, *American Eel Addendum*, *supra*, at 6 (calling for eel facility on west bank and for siting eel passage facilities based on eel "relative abundance").

the spillway, where Exelon's sampling efforts have achieved very low catch rates.[45] It is reasonable to expect that eel would also make use of the east side of the tailrace, near the east fish lift, and Exelon should undertake studies at appropriate locations on the east side of the tailrace to determine where to site and construct another eel volitional passage facility, as appropriate. We would support such a facility on the east side of the tailrace.[46] Effective attraction flows and other design elements should be included.[47] Further, Exelon should study the risk of eel drop-back into the turbines in light of likely eel passage times (night), eel passage seasons (summer), electrical generation patterns (Conowingo Dam is and intends to remain a peaking facility,[48] suggesting that it need not operate at full capacity at night), and site-specific factors (currents, optimal shoreline locations)—something Exelon has apparently not yet done—as part of determining where eel should enter Conowingo Pond. As mentioned, FERC should require Exelon to allow all eels that arrive at eel ladders or the interim trap-and-transport facility to pass the Dam. Doing so will encourage restoration of American eel to robust levels throughout their historic range in the Susquehanna River basin, which would benefit both the larger American eel population and the Lower Susquehanna River watershed ecosystem. In addition, consistent with past FERC practice, Exelon should be required to report eel counts.[49]

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[45] *See* Final Eel Engineering Report, *supra*, at iii.

[46] *See* SRAFRC, *American Eel Addendum*, at 6 (calling for eel facility near East Fish Lift or at other appropriate location on east side of river).

[47] *See* ASMFC, Special Rep. No. 90, *Proceedings of a Workshop on American Eel Passage Technologies* 5 (July 2013).

[48] *E.g.*, FLA, *supra*, at B-4, E-20.

[49] *E.g.*, New York Power Authority, 128 FERC ¶ 62,053, 64,124 (2009).

For downstream passage, Conowingo Dam must allow for volitional passage by the time that significant numbers of eels already being stocked upstream start their migration to the Sargasso Sea. SOLS et al. submit that downstream passage should be available no later than 10 years after the interim upstream truck and transport measures described below begin. This should allow more than sufficient time for determining typical eel passage seasons and times, and ways of reducing eel mortality. FERC should set a passage efficiency target of 90%, which is consistent with past practice and existing comprehensive plans.[50] Thus, Exelon should produce a plan for minimizing eel mortality, including by strategic operation of turbines (Francis units, with higher survival rates, as opposed to the more-deadly Kaplan units)[51] during non-peak hours, particularly in non-peak seasons. The study must also include shutdown/pass-through options.[52]

As described above, these recommendations for both upstream and downstream passage are consistent with existing comprehensive plans.[53]

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[50] *See* Madison Paper Industries, Inc., 104 FERC ¶ 62,060, 64,154 (2003) (90%); SRAFRC, *American Eel Addendum*, *supra*, at 7 (85%); SRAFRC, *Restoration Plan*, *supra*, at 37 (85%); Water Quality Certification for Holtwood Hydroelectric Station and Related Mitigation, FERC Project No. P-1881-054, at 27 (FERC Accession No. 20090720-5020, 2009) (85%).

[51] Final Eel Engineering Report, *supra*, at 62

[52] *See, e.g.*, Putnam Green Power LLC, 138 FERC ¶ 62,257, P 10 (2012). Exelon points out that juvenile shad and river herring tend to suffer greater mortality when passing through Francis units and that Francis units are less efficient than Kaplan units. Final Eel Engineering Report, *supra*, at 62. But Conowingo Dam can operate a mix of units, which would be helpful for both types of fish, and given that Conowingo Dam is a peaking facility, FLA, *supra*, at E-20, and all these fish tend to out-migrate in October-November, *id.* at E-129 to -130, when peaking needs are lower, *id.* at B-10 tbl.2.1-1 (average electricity production in October and November is below monthly average), Exelon has not provided a rational basis for dismissing this option.

[53] *See, e.g.*, SRAFRC, *American Eel Addendum*, *supra*, at 5-9.

C. Upstream Trap and Transport Should Be Required as a Short-Term Measure Until Volitional Upstream Passage Is Operational.

Though it appears that FWS has significant experience for siting eel ramps on the west bank below the Dam, further study may be needed before determining where eel should enter Conowingo Pond and where eel ramps and outfalls should be located for the east side of the tailrace. During that time, interim eel passage is necessary to expedite the restoration of the American eel. FERC-issued license conditions have included interim eel upstream passage requirements.[54] SRAFRC itself calls for the continuation and expansion of trap and transport, while also calling for upstream passage to be developed and implemented.[55] Indeed, an interim trap and transport program could serve as a natural precursor to permanent passage. As Exelon recognizes, volitional passageways can be initially built as trap and transport facilities and later built out into volitional passage.[56]

Eel should be transported strategically to begin seeding populations in areas where they, and the mussels they can host, will do the most benefit for the ecosystem. Thus, though stocking needs to be done throughout the watershed, it is particularly important that it be done in all tributaries of the Piedmont region. This is the area of the Susquehanna watershed with the most concentrated agricultural land use, making repopulation of mussels especially useful for helping control water pollution. SRAFRC itself notes the desirability of releasing eel to support mussel populations in key areas.[57] Although SOLS et al. do not object to Exelon sharing costs of the interim passage facility

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[54] Ne. Generation Servs. Co., 107 FERC ¶ 61,305, 62,443 (2004).

[55] *See* SRAFRC, *American Eel Addendum*, *supra*, at 5-6.

[56] *E.g.*, Final Eel Engineering Report, *supra*, at 40.

[57] SRAFRC, *American Eel Addendum*, *supra*, at 6, 9.

with the other dam operators, it would not be appropriate to allow any negotiations to delay the necessary work to begin large-scale eel restoration.[58]

D. Exelon's Proposal in the FLA Is Unacceptable and Impermissibly Vague.

For the reasons given above, only permanent volitional upstream and downstream passage for American eel will meet the needs of the Susquehanna River basin, including as documented in FERC-acknowledged comprehensive plans. Exelon's plan calling only for upstream and downstream trap and transport is not ecologically or logistically sustainable, nor is it cost-effective. Accordingly, FERC should go beyond Exelon's plan in any license for Conowingo Dam.

Exelon's analysis to support its plan is also severely lacking, as discussed more fully below.

1. Overarching Flaws in Analysis

As an initial matter, Exelon's proposal is not consistent with comprehensive plans. As Exelon acknowledges, SRAFRC, *Restoration Plan* was to serve as SRAFRC's "restoration guide and management plan for migratory fish resources. The goal of the plan is to 'restore <u>self-sustaining, robust, and productive</u> stocks of migratory fish capable of producing sustainable fisheries, to the Susquehanna River Basin <u>throughout their historic ranges</u> in Maryland, Pennsylvania, and New York.'"[59] While the 2010 SRAFRC plan does not contain a numeric target for eel passage as it did for shad and river herring,

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[58] *See generally* Memorandum from Seth Johnson & Jennifer Chavez, Earthjustice, to Andrew Tittler, U.S. Dep't of the Interior, Solicitor's Office (Nov. 12, 2013) (attached) (urging FWS to use fishway prescription power to speed eel restoration through interim trap and transport of eel from below Conowingo Dam to key points in Susquehanna watershed, including areas below other dams on the Lower Susquehanna).

[59] FLA, *supra*, at E-384 (emphasis added).

its professed goal plainly covers American eel and the plan manifestly establishes objectives for upstream and downstream eel passage, including at FERC-licensed hydroelectric dams.[60] Exelon cherry-picks quotes, entirely omitting mention of the eel component.[61] Even if there were any question, SRAFRC, *American Eel Addendum* is a comprehensive plan covering eel that establishes the goal that "every American Eel that approaches Conowingo Dam" passes upstream and that at least 85% of downstream migrants survive.[62] Exelon's claim that its proposal is consistent with the 2010 SRAFRC plan (and other identified plans) is entirely unreasonable. Exelon fails to show that its plan will "ensure adequate passage of American eels" upstream or that its plan will "[e]nsure at least 85 percent survival" or "[e]stablish operational measures … to ensure survival of silver eels passing downstream."[63] Thus, there is no basis in the record for Exelon's claim that operating Conowingo Dam without operational changes for eel, and without permanent eel passage that will allow restoration of eel to their full historical range, is "consistent" with SRAFRC's comprehensive 2010 plan.[64] Nor is there any basis for claiming that "[t]he continued operation of the Project will not have a significant impact on any migratory fish population in the Susquehanna River."[65] Further, Exelon's proposal for a highly limited trap and transport program, with stocking occurring solely upstream of York Haven Dam, cannot be reconciled with SRAFRC's 2013 plan, which

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[60] SRAFRC, *Restoration Plan*, *supra*, at 35, 37-38, 48, 50-52.

[61] *See* FLA, *supra*, at E-384.

[62] SRAFRC, *American Eel Addendum*, at 5, 7.

[63] SRAFRC, *Restoration Plan*, *supra*, at 37; *accord* SRAFRC, *American Eel Addendum*, *supra*, at 5-7.

[64] FLA, *supra*, at E-384.

[65] *Id.*

calls for eel stocking throughout the basin, including areas below the upstream dams.[66] Exelon's analysis of the eel passage options set out in the Final Eel Engineering Report is also arbitrary. Exelon assumes there are only two "resource management objectives": maximizing the number of silver eel out-migrating; or "maximiz[ing] eel abundance upstream of York Haven Dam."[67] It thus fails to consider other resource management objectives that are actually consistent with existing comprehensive plans. These include (1) restoration of the American eel population in a sustainable way throughout the eels' historic range in the Susquehanna River Basin and (2) restoration of environmental conditions to as close to pre-Conowingo Dam conditions as possible.[68] Because Exelon's analysis fails to consider other reasonable resource management objectives, Exelon's claim that up- and downstream trap and transport is the best option is arbitrary.[69]

To the extent Exelon discusses the effects of American eel restoration on the Eastern elliptio mussel, its analysis fails to engage with the science. The analysis summarizes documents Exelon obtained through a Freedom of Information Act request and emphasizes that the information is "limited."[70] But recent published research, including detailed supporting data, has shown that the previously identified hosts for elliptio mussels are not effective hosts in the Susquehanna River watershed.[71] Of the species the recent research identifies as effective hosts, American eel are, by far, the most

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[66] *See* SRAFRC, *American Eel Addendum*, *supra*, at 6, app.A 17-18.

[67] Final Eel Engineering Report, *supra*, at 79-80.

[68] *See* SRAFRC, *American Eel Addendum*, *supra*, at 5; SRAFRC, *Restoration Plan*, *supra*, at 35.

[69] Exelon also fails even to mention that FWS has found that listing American eel as "threatened" under the Endangered Species Act may be warranted, 76 Fed. Reg. 60,431, 60,431-32 (Sept. 29, 2011).

[70] *E.g.*, FLA, *supra*, at E-159 to -161.

[71] Lellis et al., *supra*, at 79; *see also id.* at 83 (linking to supporting data).

effective.[72] Moreover, the other four hosts have very limited ranges where they would co-exist with Eastern elliptio in the watershed. Lake trout only exist in the Susquehanna in isolated lakes, and brook trout and the two sculpin species live almost exclusively in smaller cold-water tributaries—not the mainstem and warm-water streams where the bulk of the mussel populations would be expected.

2. Flaws in Analysis of Upstream Passage

Exelon does not provide reasoned analysis in key aspects of its discussion of upstream passage. First, Exelon fails to adequately discuss how facilities for upstream passage would be most effectively sited in terms of attraction flows, despite the fact that FWS and Exelon itself have real-world experience with attracting eels below the Dam.[73] Second, in its discussion of volitional passage, Exelon provides no analysis of where outfalls should be located to avoid drop-back into Conowingo Pond.[74] All Exelon does is allude to the possibility of using "technologies similar to" one other dam on another river, the St. Lawrence-FDR facility.[75] Exelon should also provide analysis of eel passage facilities at dams like the Beauharnois, in Quebec, and S.D. Warren's Dundee Project, in Maine.[76] Third, Exelon's proposal to transport eels to tributaries about 50 feet wide, upstream of York Haven Dam, has no rational basis at all. Indeed, Exelon acknowledges

[72] *Id.*

[73] FLA, *supra*, at E-152, E-162 to -163; *id.* ex.E app.A at 10 (acknowledging that there are "logistical impediments posed by the sampling area" for eel, but claiming Exelon did well enough and "provided important information to help site potential eel ramp locations in the future").

[74] *See* Final Eel Engineering Report, *supra*, at 36-37, 39-40; *supra* p.14 (giving some relevant considerations).

[75] Final Eel Engineering Report, *supra*, at 36.

[76] *See* Milieu, Inc., *Beauharnois Generating Station Eel Ladders* (last visited Dec. 12, 2013), http://milieuinc.com/projet1-a.html (discussing eel passage facilities); Final Eel Engineering Report at 44 tbl.5.1.1-2 (Beauharnois Dam is about 80 feet high); S.D. Warren Co., 105 FERC ¶ 61,009, 61,032, 61,042 (2003) (requiring installation of eel passage facility at 50-foot-high Dundee Project dam on Presumpscot River, Maine).

that it just made up the 50-feet number as part of an effort to lead stakeholders to discuss (and implicitly give credence to) Exelon's preference for downstream trap and transport.[77] It is further irrational for Exelon to base its proposal for upstream passage on its preference for how downstream passage would function, where that preference has no obvious rational basis in ecological considerations and, as already discussed, limiting eel restoration to areas above York Haven Dam is inconsistent with comprehensive plans.[78]

3. Flaws in Analysis of Downstream Passage

Exelon's discussion of downstream passage is extremely vague, with irrational supporting analysis. First, Exelon has no concrete plan whatsoever for downstream trap and transport, and admits that, regardless, it prefers that option over any other.[79] Exelon provides virtually no analysis of how downstream trap and transport would actually function, or, indeed, whether it actually could.[80] Exelon's attempt to rush ahead without adequate information, or even a plan to develop adequate information, is irrational.

Second, to the extent that Exelon is relying on some "group consensus" at a two-day workshop on downstream passage options as the basis for its proposal for

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[77] *See* FLA, *supra*, ex.E app.A at 23.

[78] Exelon states that its proposal "would allow for upstream passage above York Haven Dam with transported eels released in small tributaries (approximately 50 feet wide) upstream of York Haven Dam that were previously stocked by the USFWS." FLA, *supra*, at E-152; *accord id.* at E-161. This statement appears to originate with the following statement from the Final Eel Engineering Report: "For costing purposes, Exelon has assumed the program will start in small tributaries (~50 feet wide) upstream of York Haven Dam that have been stocked by the USFWS." Final Eel Engineering Report, *supra*, at vi. In the FLA, Exelon omits the phrases "for costing purposes" and "will <u>start</u> in small tributaries." FERC should look skeptically on Exelon's attempt to hide the ball.

[79] FLA, *supra*, ex.E app.A at 27.

[80] *See id*. at E-154; Final Eel Engineering Report at 78 (acknowledging "[t]here is very little information on the efficiency of eel-weir type of collection facilities, particularly for a mainstem location on a large river such as the Susquehanna" and basing assumed trap efficiency on conversations with one person).

downstream trap and transport in only 50-foot wide tributaries above York Haven Dam,[81] that reliance is irrational: there was no such "consensus." The Lower Susquehanna Riverkeeper participated in that workshop,[82] and assures FERC there was no consensus on Exelon's proposal.[83] If anything, a trap and transport directly above York Haven Dam, on the mainstem of the Susquehanna, was discussed as addressing the need for eels migrating from numerous tributaries upriver of York Haven Dam, not the very limited option Exelon now proposes. Exelon itself admits that stakeholders have not reached any sort of consensus on its proposal that limits transportation to 50-foot wide tributaries.[84]

Third, Exelon's conclusion that downstream passage through the turbines would produce a range of survival, from 95% to less than 80%, is vague, providing no lower bound.[85] Exelon points to a limited, site-specific study that presents survival rates that are substantially higher than those traditionally accepted.[86] Further casting doubt on the study, Exelon acknowledges that "spillage occurred for a number of days during which eels were outmigrating," and thus it does not actually know how many eels went through the turbines as opposed to the spillway.[87]

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[81] *See* Final Eel Engineering Report, *supra*, at vi, 69.

[82] *See id.* app.A at 6

[83] *See id.* app.A at 4 ("Michael Helfrich (Riverkeeper) suggested that it would be beneficial to have eels in the lower basin for eastern elliptio propagation.").

[84] FLA, *supra*, ex.E app.A at 23.

[85] FLA, *supra*, at E-154.

[86] *Compare id.* at E-129 (study of 88 eel released in Conowingo Pond in 2011 found 89.8% of detectors were later located well below Dam), *with, e.g.*, Final Eel Engineering Report, *supra*, app.A attach.B slide 16 (presentation of Alex Haro, U.S. Geological Survey, titled "Eel Biology and Downstream Migratory Behavior") (estimating 5-100% of eels are injured or killed by turbine passage).

[87] FLA, *supra*, at E-129.

Moreover, such analysis that Exelon does provide is inconsistent. For example, a supporting document recommends, based on experience with transporting large eels, like the silver eels that Exelon proposes to transport downstream, "that handling and transportation be minimized."[88] Yet Exelon proposes to drive whatever eels it catches in the upstream traps 220 miles downstream to be released, after holding them for up to two days.[89]

II. SCOURING OF TRAPPED SEDIMENT BEHIND THE DAM IS A SUBSTANTIAL AND UNACCEPTABLE PROJECT-INDUCED IMPACT.

Since its construction, the Project has profoundly altered the Lower Susquehanna River system. Among other things, the Project traps some of the sediment and nutrients delivered from upstream sources into the Conowingo Pond.[90] The Project's reservoir traps an average of 50-67% of the annual sediment load (1.5 to 2 million tons),[91] 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. While some have described the Conowingo Dam's sediment trapping effect as a boon to the downstream ecosystem, it would be overly simplistic to describe the Project's sediment trapping effect as a beneficial feature of the

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[88] Final Eel Engineering Report, *supra*, app.A attach.E slide 43 (presentation of William A. Richkus, Ph.D., Versar, Inc., titled "Review of Research and Technology on Passage and Protection of Downstream Migrating Eels").

[89] *Id.* at 75 tbl.6.3-1.

[90] *See* FLA, *supra*, at E-50.

[91] *See* Final Study Report: Sediment Introduction and Transport Study: RSP 3.15 at 11, 14-15 (FERC Accession No. 20120831-5086, Aug. 31, 2012) [hereinafter FSR 3.15]; *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) [hereinafter 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).

Project. First, the dam's sediment trapping effect prevents larger-grained beneficial sediment from reaching downstream habitats in the Lower Susquehanna River and Chesapeake Bay. Second, this effect has produced a large repository of both coarse- and fine-grained sediment and associated nutrients that can be re-mobilized ("scoured") and delivered downstream by large storm-induced flows.[92] These 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 storm durations and flows had the Project not been in place. The scoured materials cause adverse effects downstream of the Project. Exelon must therefore develop alternatives for preventing Project-induced scouring.

A. Request to Accept the Chesapeake Bay TMDL as a Comprehensive Plan Under FPA Section 10(a)(2).

In December 2010 the U.S. Environmental Protection Agency ("EPA") Region 3 established the *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (Dec. 29, 2010) [hereinafter Chesapeake Bay TMDL].[93] It sets forth a comprehensive plan for improving, developing, or conserving a waterway affected by Conowingo Dam, including pollution limits for the Susquehanna River, which supplies approximately 50 percent of the Bay's freshwater volume. The Bay TMDL was

[92] *See* FSR 3.15, *supra*, 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) [hereinafter Langland & Hainly (1997)]; Langland (2009), *supra*; 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) [hereinafter Hirsch (2012)].

[93] The full Chesapeake Bay TMDL is available at http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html.

established under authority of the Clean Water Act[94] in coordination with Pennsylvania, Maryland, and other states within the Bay watershed. It articulates the standards applied, the data relied upon, and the methodology used to establish the TMDLs. For these reasons, the Chesapeake Bay TMDL satisfies the criteria that the Commission uses in deciding whether to consider a comprehensive plan under Section 10(a)(2), 16 U.S.C. § 803(a).[95] SOLS et al. are filing herewith a copy of the Chesapeake Bay TMDL along with "Appendix T" to the TMDL, which specifically addresses assumptions pertaining to the Project, and request that FERC accept the Chesapeake Bay TMDL as a comprehensive plan under Section 10(a)(2).

B. Continued Operation of the Project Will Cause Unacceptable Adverse Impacts Due to Scouring of Trapped Sediment.

Section 10(a) of the Federal Power Act authorizes the Commission to issue licenses subject to conditions that are best suited for power development and other public uses of the nation's waters.[96] In deciding whether to issue a license, the Commission, "in addition to the power and development purposes for which licenses are issued, shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality."[97] The lack of adequate analysis in Exelon's study

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[94] 33 U.S.C. § 1313.

[95] FERC Order No. 481-A, 53 Fed. Reg. 15,802 (May 4, 1998).

[96] *See* 16 U.S.C. § 803(a).

[97] *Id.* § 797.

report makes it difficult, if not impossible, for FERC to give proper consideration to these interests.[98]

The Project traps a large percentage of the sediment passing through the Lower Susquehanna River watershed system.[99] The rate at which sediments are trapped varies; it was estimated by USGS in 2009 to be about 2,000,000 tons per year or about 55% of incoming sediment load.[100] This rate is understood to be declining asymptotically as the reservoir approaches dynamic equilibrium, the point when "sediments will no longer be effectively trapped and loads transported out of the reservoir will approach the loads transported into the reservoir."[101] In 2009, based on 2008 bathymetry studies of the Project's reservoir, scientists estimated that the reservoir would trap about 30,000,000 more tons before it reaches equilibrium.[102] Based on the estimated annual trapping rate of 2 million tons, and assuming no scour from large storms, USGS in 2009 estimated that "Conowingo Reservoir could reach the remaining sediment-storage capacity… in about 15–20 years."[103]

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[98] For these reasons, it was inappropriate for FERC to allow Exelon to abandon a proper analysis of Project-induced scour and to forego its responsibility to develop appropriate "benchmarks" for addressing scour. *See* FERC, Determination on Requests for Modifications to the Conowingo Hydroelectric Project Study Plan (FERC Accession No. 20120521-3002, May 21, 2012) [hereinafter FERC Determination on Modifications] (dismissing objections by SOLS et al. and the Maryland resource agencies regarding Exelon's omission of benchmarks in study report 3.15, contrary to the approved study plan); *see also* FERC, Study Plan Determination for the Conowingo Hydroelectric Project 5 (FERC Accession No. 20100204-3055, Feb. 4, 2010) (stating that "the study report should include a sediment management plan that includes projections of sediment accumulation; benchmarks for potential impacts and actions; and options to manage, mitigate, and remove accumulated sediment.").

[99] Langland & Hainly (1997), *supra*.

[100] Langland (2009), *supra*.

[101] Langland (2009), *supra*, at 19.

[102] *Id*.

[103] *Id*.

Currently the trapped sediment and attached nutrients are growing increasingly vulnerable to scouring from the reservoir and subsequent discharge downstream into the Lower Susquehanna River and Chesapeake Bay.[104] The latest science shows that the scour threshold – the volume of flow at which scour occurs – is becoming lower as the reservoir approaches equilibrium. In 2012 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."[105] Whereas previous estimates placed the scour threshold for Conowingo Pond at around 400,000 cubic feet per second (cfs), the 2012 USGS study supported an updated estimate of 175,000 – 300,000 cfs.[106] Based on historic flows, we can expect to see the scour threshold exceeded many times during the proposed license period.

Despite available evidence that scour is occurring, Exelon's final study report on sediment transport offers only a cursory and oversimplified view of the impact of Project-induced scour upon Chesapeake Bay water quality. According to Exelon, "[t]he impact of [scour] on sediment and nutrient loading to Chesapeake Bay is to alter the timing of sediment and nutrient delivery to the Bay (more during major floods and less during non-flood periods)."[107] Far more than "alter the timing of sediment and nutrient loading," a large scour event could have catastrophic impacts on water quality in the northern Chesapeake Bay. Just one such event – much less a number of scour events projected to

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[104] *Id*. at 19; Hirsch (2012), *supra*, at 10.

[105] Hirsch (2012), *supra*, at 10.

[106] *Id*. at 12.

[107] FSR 3.15, *supra*, at 11.

occur within the proposed license period – would seriously undermine the goals of the Chesapeake Bay TMDL. Despite this, Exelon failed to estimate the approximate quantity of sediment scoured from within the Project under various flow scenarios, or to assess the environmental impacts of such scouring events.

Today, we are past the time for identifying future benchmarks to trigger appropriate remediation actions. As stated in the recent peer-reviewed report by the USGS:

> 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 and sediment entering, and scouring of sediment in, the reservoirs along with the management actions implemented upstream in the watershed.[108]

Therefore, FERC must require Exelon to submit a detailed analysis of sediment-removal alternatives to support appropriate license conditions to address this problem.[109] Unless and until Exelon produces a specific action plan for preventing scouring impacts, FERC cannot and should not issue a renewed license for the Conowingo dam.

C. Exelon's Final License Application Lacks an Adequate Discussion of the Scour-Related Impacts of the Project.

Rather than explain how it proposes to address the negative impacts the Project has on downstream waters because of the sediment it traps, Exelon purports to delegate

[108] Hirsch (2012), *supra*, at 13 (emphasis added).

[109] If sediment removal alternatives were not proposed, at a minimum scour would still need to be assessed as an "unavoidable adverse impact." This would be wholly inappropriate, however, because there is no factual basis for finding that impacts due to scour are "unavoidable."

this responsibility to others.[110] It is certainly appropriate for Exelon to continue cooperating with federal and state authorities as part of the Lower Susquehanna River Watershed Assessment ("LSRWA") led by the U.S. Army Corps of Engineers, and to use that process as a source of information and ideas.[111] But such watershed-wide efforts do not excuse Exelon from its responsibility to study and propose alternatives for preventing Project-induced scour. Furthermore, delegating this responsibility takes it outside of the FERC process, leaving resource agencies and stakeholders with no ability to comment on flaws in the study designs or process within the FERC re-licensing process. These flaws are significant. For instance, the current LSRWA studies were based on limited data due to financial constraints on the LSRWA process, and as a result, they do not evaluate the effects of storms as large as the three largest scour-producing storms in the last 50 years; scouring events from Tropical Storm Lee and Hurricane Agnes were not evaluated in the LSRWA studies. Studies of relevant storm events are the responsibility of Exelon, and the excuse of inadequate *public* funding is unacceptable.

To the extent that the Final License Application discusses scour, it notes that further studies may help to better isolate the impact of scour from the impact of other sources of sediment during major storms.[112] However, ultimately Exelon's efforts to distinguish Project-induced scour from non-Project sources is a distraction, because Exelon's responsibility for the Project-induced loads due to scour is not diminished by

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[110] *See, e.g.*, FLA, *supra*, at E-50, and FSR 3.15, *supra*, at i (purporting to defer analysis of scour impacts until "future development of an overall sediment management strategy for the lower Susquehanna River and Chesapeake Bay by others"); FSR 3.15, *supra*, tbl.5.6-1 (stating that the "Corps needs to conduct a feasibility study" regarding the alternative of dredging behind the dam to address scour).

[111] Exelon is already a participant in the study. *See* FSR 3.15, *supra*, at 36-37.

[112] FSR 3.15, *supra*, at 10.

the presence of other sources of sediment—and the only way to prevent loads from scouring is to remove the material trapped behind the dam so it is no longer available to be scoured.

The Final License Application incorrectly implies that Project-induced impacts due to scour could be prevented by watershed-wide pollution control efforts.[113] There is no evidence to support this notion. Watershed pollution controls may help slow the reservoir-filling process, but it has been shown that scouring is not contingent on future filling of the reservoir; scouring is already occurring, at lower thresholds than previously thought.[114] Moreover, watershed pollution controls will not prevent scouring of the sediment that is already present and continuing to fill Conowingo Pond. Just one catastrophic pulse caused by scouring could eclipse a decade of upland pollution control efforts. In the absence of a plan to remove trapped material from the reservoir, continued operation of the Project will harm downstream water quality and habitats, and undermine comprehensive restoration plans and the Chesapeake Bay TMDLs.

Although the 2012 USGS report shows that the following numbers underestimate current and future conditions, the table below helps provide a picture of the expected frequency of flow events and the volume of scour each event would produce:[115]

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[113] *See*, *e.g.*, FLA, *supra*, at E-51 ("Best Management Practices (BMPs) from all sediment/nutrient source sectors are effective in reducing sediment and nutrient loads to Conowingo Pond.")

[114] *See* Hirsch (2012), *supra*, at 11-12.

[115] This table was provided by the USGS to the Lower Susquehanna River Watershed Assessment in its August 2013 meeting.

Flow (cubic feet per second)	Recurrence Interval (years)	Predicted scour at 400,000 cfs (tons)[1]	Predicted total load scour plus watershed (tons)[2]	Percent scour to total load
1,000,000	80	12,000,000	28,000,000	43
900,000	45	8,000,000	20,200,000	40
800,000	25	5,800,000	18,000,000	32
700,000	15	4,000,000	16,000,000	25
600,000	10	3,000,000	13,400,000	22
500,000	6.25	1,600,000	7,400,000	22
400,000	4	1,000,000	4,500,000	22
300,000	2	0	1,000,000	0

These predictions illustrate the stark reality of this problem: As shown in the table, a storm producing 400,000 cfs can be expected about every four years. During a storm of that magnitude, 1 million tons of sediment and attached nutrients would be scoured and delivered below the Dam. Once every 6.25 years, a storm of 500,000 cfs would scour about 1.6 million tons of sediment from the reservoir; once a decade a storm of 600,000 cfs would scour about 3 million tons; and once every 15 years, a single storm producing a flow of 700,000 cfs would dump 4 million tons of scoured sediment below the Dam. If not for the Project, this sediment would not be delivered to the Bay in large, potentially catastrophic pulses. Several storms of comparable magnitude can be expected during the proposed license period.[116] Such storms would have devastating immediate effects on

[116] As discussed below, the frequency and magnitude of storms is likely to increase in the future due to climate change.

suspended sediment and nutrient loads in the system. As with the aftermath of Tropical Storm Lee in 2011, turbidity in the upper Chesapeake Bay and the Susquehanna Flats would spike dramatically and remain that way for days, weeks, or more. When these storms occur during critical life cycle phases, scouring causes impacts to aquatic organisms like crabs attempting to migrate to the upper Bay, submerged Bay grasses attempting to establish new shoots, and oyster spat attempting to attach to solid surfaces.[117] Exelon has not evaluated these impacts.

Exelon cannot seriously dispute the evidence that Project-induced scour will occur during the proposed license period, and that it will occur more frequently—and in larger volumes—as Conowingo Pond continues to fill with sediment. As discussed below, questions raised by Exelon in its Final License Application go only to degree or timing of equilibrium and scour, but they do not contravene overwhelming evidence that these impacts will occur within the license period. Simply allowing Conowingo Pond to fill up with sediment is not an acceptable option, for it will allow progressively more severe scour events to occur. The sediment problem the Project causes is sizeable, and FERC must act in this proceeding to alleviate it.

1. Watershed-Based Pollution Controls Will Only Briefly Delay Equilibrium and Will Not Prevent Project-induced scour.

Contrary to misleading statements in the Final License Application and Final Study Report 3.15, the Chesapeake Bay TMDLs do not address the impacts of Project-induced sediment scour, and will not prevent those impacts. In fact, the Chesapeake Bay

[117] *See generally* P. Wang & L.C. Linker, *Effect of Timing of Extreme Storms on Chesapeake Bay Submerged Aquatic Vegetation* (2005); Maryland Sea Grant College, *Dams, Sediment, and the Bay*, Chesapeake Quarterly (Dec. 2011); W.C. Dennison, T. Saxby, B.M. Walsh, eds., *Responding to Major Storm Impacts: Ecological Impacts of Hurricane Sandy on Chesapeake and Delmarva Coastal Bays* 4-5 (2012).

TMDLs only make the Project-related problems more urgent. Failing to prevent the scouring of materials trapped in the Project's reservoir is contrary to the Bay TMDLs and would seriously undermine their implementation.

The Chesapeake Bay TMDLs did not include a pollutant load allocation for loads to the Bay attributable to scouring of stored sediment in Conowingo Pond. Instead, EPA "assume[d] the current trapping capacity will continue through the planning horizon for the TMDL (through 2025)," and expressly <u>did not</u> consider "future diminished trapping capacity behind the Conowingo Dam" in developing pollution load allocations under the Bay TMDL.[118] EPA further stated that "[i]f 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."[119] In the meantime, EPA observed that pollution controls in the watershed above the Project would help to attenuate Project-induced loads, and encouraged the states to work with FERC in this licensing proceeding to "develop an implementation strategy for the Conowingo Dam."[120] Likewise, as Exelon acknowledges, none of the states' Watershed Implementation Plans ("WIPs") included pollution controls sufficient to prevent or offset the Project-induced impacts of scour.[121]

Scour loads from the stored sediments at the Project cannot be prevented by actions taken upriver of the Project's reservoir, because upstream reductions do nothing

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[118] Chesapeake Bay TMDL, *supra*, app.T at 5.

[119] *Id*. SOLS et al. do not agree that EPA's failure to address these loads in the Chesapeake Bay TMDL was appropriate or consistent with legal requirements.

[120] *Id*.

[121] *See* FSR 3.15, *supra*, at 41 (stating "[n]one of the WIPs include strategies to escalate sediment/nutrient reduction efforts if the sediment trapping efficiency of Conowingo Pond is found to decline.")

about the already-accumulated sediment behind the Dam. At best, upstream reductions could help slow the already harmful situation from growing worse. Following implementation of the New York and Pennsylvania WIPs, nearly 1 million tons of sediment will be discharged each year.[122] If 55% of this is trapped in the Project's reservoir, approximately 500,000 tons per year will be added to the already accumulated sediment. Moreover, a recent assessment by the Maryland Department of Natural Resources staff showed that even under an idealistic "E3" scenario (*i.e.*, if "everything, everywhere, by everyone," possible was done, without regard to physical limitations, participation rates, or cost), "the maximum available sediment per year that could be reduced by additional BMP implementation above and beyond the WIP implementation throughout the [entire] Susquehanna River Watershed is approximately 95,000 tons/year."[123] In other words, the Project's reservoir will continue to trap sediment, but at a slower rate.

Exelon observes that that implementation of watershed best management practices ("BMPs") "from all sediment/nutrient source sectors are effective in reducing

[122] New York's WIP targets for sediment loads in 2025 for New York (293-322 million lbs/yr) plus the Pennsylvania's target for 2025 (1,677,008,769 lbs/year) total 1,970,008,769-1,999,008,769 lbs/year or between 985,004 and 999,504 tons/yr. N.Y. State Dept. of Envtl. Conservation, Final Phase II WIP for New York Susquehanna and Chemung River Basins 14 (Jan. 7, 2013), and personal communication with Ted Tesler, PA Dept. of Envtl. Protection (Aug. 9, 2013)

[123] *See* LSRWA, Meeting Minutes for Quarterly Meeting, August 15, 2013, at 9-10 (Sept. 24, 2013). The statement in the original specifies "lower Susquehanna River Watershed," however this was a clerical error. The actual analysis estimated maximum sediment reductions under "E3" assumptions for the entire Susquehanna River watershed, not just the Lower Susquehanna River watershed. Personal communication from Bruce Michael, MDNR (Dec. 5, 2013).

sediment and nutrient loads to Conowingo Pond."[124] This is meaningless. That pollution control activities (*i.e.*, BMPs) are capable of preventing some sediment and nutrient pollution from moving through the system says nothing about how those activities would be effective at preventing Project-induced scour. For the reasons discussed above, upland sediment reductions will do nothing to prevent scouring of the sediment that is already trapped by the Dam's reservoir. Without removing the trapped sediment, the continued, unchanged operation of the Project will cause a substantial increase in Project-induced scouring even if the states aggressively employ "watershed BMPs from all sediment/nutrient source sectors."

2. Exelon's Statements Regarding the Scouring Threshold Are Irrelevant.

Instead of analyzing the likely impact of scour, much of the apparent effort for FSR 3.15 went toward Exelon's attempt to obfuscate widely-accepted hypotheses regarding scour, which are based on peer-reviewed studies. At most, the questions that Exelon raises go to the degree or timing of scour impacts; they do not raise fundamental questions about the basic inference that Project-induced scour is an adverse impact of continued Project operations.

For example, as part of the Final Study Report on sediment, Exelon performed a modeling analysis using the "HEC-6" model to test the assumption that scour occurs at 400,000 cfs.[125] The U.S. Army Corps of Engineers developed the HEC-6 model and

[124] FLA, *supra*, at E-51; *see also* FSR 3.15, *supra*, at 40-41 (discussing NRCS (2011)). The NRCS 2011 paper used models to estimate sediment and nutrient loading under a variety of best management practices (BMPs) in use during 2003-2006, versus modeled loads during the same period without the application of those BMPs. *Id.* While it may provide a useful vision of what BMPs might be capable of accomplishing, it is not an estimate of actual BMP implementation or effectiveness.

[125] *See* FSR 3.15, *supra*, at 30-31.

USGS applied it in 1995 to simulate the transport of sediment through the series of reservoirs on the Lower Susquehanna River.[126] However, the authors of the 1995 USGS analysis pointed out in the same study that HEC-6 had significantly under-predicted scoured sediment, stating that "[h]igh-flow sediment transport was not simulated in the HEC-6 model as well as the data of table 12 indicates…. Sediment scoured from the three reservoirs may have been more than 23 million tons instead of the 2 million tons of deposition simulated in the model."[127] With this in mind, we struggle to find a rational basis for Exelon's self-serving use of HEC-6 to test assumptions regarding the scour threshold.

Exelon also suggests that the estimated 400,000 cfs scour threshold might have been wrong because the earlier reports upon which that estimate was based (Gross et al. (1978) and Lang (1982)) had underestimated sediment load inputs between Harrisburg, Pennsylvania and Conowingo Dam, thereby overestimating the effect of scouring.[128] However, the magnitude of this potential overestimation is not as significant as Exelon implies. Subsequent analysis did include "sediment loads from the Conestoga River and Pequea Creek, the two largest sediment sources to the reservoir system below Marietta."[129] The potential overestimation was found to be inconsequential.[130]

Exelon also speculates that more than half of the scour estimated by Langland and Hainly in 1997 is not attributable to scour, but to turbulence caused by operation of the

[126] Hainly, et al., *Deposition and Simulation of Sediment Transport in the Lower Susquehanna River Reservoir System* 27 (1995). "HEC" stands for "Hydrologic Engineering Center." *Id*.

[127] *Id*. at 34. Exelon acknowledges this discrepancy. FSR 3.15, *supra*, at 17.

[128] FSR 3.15, *supra*, at 12.

[129] Langland & Hainly (1997), *supra*, at 20.

[130] Langland, personal communication (n.d.) (comments on May 6, 2011 Revised Study Report 3.15)

Project gates.[131] It is entirely unclear how Exelon believes that this point—even if true—would diminish its responsibility. From the perspective of downstream water quality, there is no difference between turbulence-induced re-suspension of trapped materials and scouring. Further, turbine related turbulence is basically constant, so its impact is not likely to change over time.

Ultimately, Exelon's quibbling about the scour threshold is of little moment because significant changes in bathymetry and scouring threshold at the Project have occurred in just the last decade. In 2012, Hirsch estimated that the scour threshold "lies in the range of about 175,000 to 300,000 ft^3/s."[132] In short, Exelon has failed to raise substantial doubts regarding expert predictions that Project-induced scour is likely to cripple restoration efforts in the Chesapeake Bay watershed absent swift intervention.[133]

3. Exelon's Cumulative Impact Analysis is Seriously Flawed.

FERC's regulations set forth the minimum requirements for an analysis of cumulative impacts:

> List cumulatively affected resources based on the Commission's Scoping Document, consultation, and study results. Discuss the geographic and temporal scope of analysis for those resources. Describe how resources are cumulatively affected and explain the choice of the geographic scope of analysis. Include a brief discussion of past, present, and future actions, and their <u>effects on resources based on the new license term</u> (30–50 years). Highlight the effect on the cumulatively affected resources from <u>reasonably foreseeable future actions</u>. Discuss past

[131] *See* FSR 3.15, *supra*, at 34.

[132] Hirsch (2012), *supra*, at 12.

[133] Langland (2009), *supra*, at 19; *cf.* FSR 3.15, *supra*.

> actions' effects on the resource in the Affected Environment Section.[134]

Exelon's Environmental Exhibit to the FLA does not meet this standard.

Exelon's "cumulative impact analysis" provides little relevant information regarding the cumulative impact of scour in the context of other ongoing and future sources of water quality impairment downstream from the Project. Exelon unhelpfully reminds us that Conowingo Pond will continue to retain sediment, until it ceases to do so:

> With or without the proposed Sediment Management Plan the Project will continue trapping sediment as long as steady-state conditions are not reached. With successful implementation of the EPA Chesapeake Bay TMDL program, sediment loads to the Project will be reduced and the time to Project sediment storage capacity will be prolonged. The cumulative impact of the Project will be to continue to reduce sediment and nutrient loads to Chesapeake Bay until sediment-storage capacity is reached.[135]

Exelon's conclusion is inexplicably truncated at the point of equilibrium, the very place where the cumulative impact analysis should have just taken off.

Further, Exelon's analysis has nothing to do with scour. FSR 3.15 fails to quantify the impact of scour that will occur during the license period, or assess that impact in the context of other activities that will contribute to Chesapeake Bay sediment loads. This is grossly inadequate. It is also inexcusable. The Project creates a repository of sediment that is available to be remobilized and dumped into the Chesapeake Bay during large storms. Surveys conducted after past large storms (*e.g.*, Hurricane Agnes in 1972 and Tropical Storm Lee in 2011) show that the Project's cumulative impacts encompass

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[134] 18 C.F.R. § 5.18(b)(2).

[135] FSR 3.15, *supra*, at 57.

severe and adverse impacts to parts of the Chesapeake Bay ecosystem. For example, Hirsch (2012), *supra*, quantifies the relative impact of Lee in comparison to annual average loads from the prior decades:

- 78% of the Susquehanna's sediment contribution, 61% of its phosphorus contribution, and 31% of its nitrogen contribution in 2011 came in the aftermath of Tropical Storm Lee. At least 25% of this pollution came from scoured sediment and nutrients;[136]
- 39% of the Susquehanna's sediment contribution, 22% of its phosphorus contribution, and 5% of its nitrogen contribution from 2002-2011 came in the aftermath of Lee; and
- 22% of the Susquehanna's sediment contribution, 9% of its phosphorus contribution, and 1.8% of its nitrogen contribution from 1978-2011 came in the aftermath of Lee.[137]

The FLA contains no discussion of the impact of future storms of the same or greater magnitude in the context of continued future operation of the Project. Nor does it contain any discussion about the context of climate change and related impacts on the frequency and magnitude of storms. As the U.S. EPA has noted in comments to FERC, climate change is likely to exacerbate scouring even beyond current predictions.[138]

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[136] See table on p.31, above.

[137] Hirsch (2012), *supra*, at 12, tbl.2.

[138] See EPA, Comments on FERC's Notice of Application Accepted for Filing 1-2 (FERC Accession No. 20130812-0009, Aug. 12, 2013) (citing Maryland Sea Grant Chesapeake Quarterly Magazine (Dec. 2011) and U.S. Climate Change Science Program for Fiscal Year 2009, Highlights of Recent Research and Plans for FY 2009.)

Exelon attempts to minimize the adverse cumulative impacts of the Project's scouring effect. It claims that "[t]he cumulative impact of the Project to the system is to provide the last site of sediment storage along the Susquehanna River before sediment reaches Chesapeake Bay. This has benefited Chesapeake Bay by providing a means by which the quantity of fine-grained sediment and associated nutrients, sources of water quality impairment, reaching the Bay are reduced."[139] This is ridiculously oversimplified, and ignores sediment scouring as well as the fact that the Project also traps beneficial sediment—both <u>adverse</u> cumulative impacts.

Final Study Report 3.15 also attempts to minimize the cumulative impact of the Project in comparison to other hydropower projects on the Susquehanna River. It states that "[t]he impact of the Project has been to alter the sediment budget of the Lower Susquehanna River which had already been altered by Holtwood Dam (built 1910) when the Project was initially constructed in 1928."[140] Similarly, it states that "[t]he Project's impact on coarse sediment transport (sand and gravel) is exerted on a sediment supply already similarly affected by the Holtwood and Safe Harbor Dams."[141] On the contrary, the impact of the Project is not a "similar" effect to the other upstream dams, because the reservoir capacity of the Conowingo Pond is much greater, and increases the effects of the other dams vastly. Safe Harbor Dam's reservoir holds 92 million tons of sediment at full capacity, and Holtwood Dam's reservoir holds 14 million. Conowingo Dam's reservoir, by contrast, holds 204 million tons sediment at full capacity.[142] Moreover,

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[139] FSR 3.15, *supra*, at 56

[140] *Id*.

[141] *Id*.

[142] USGS, *Lower Susquehanna River Reservoir System Bathymetry* at slides 16, 17, 19 (Sept. 23, 2009).

comparing the impacts of the Project with the impacts of other projects does not determine what the impacts of the Conowingo Project actually are. That is the relevant question, and Exelon dodges it.

Finally, the discussion of the cumulative impacts of scour in FSR 3.15 is also internally contradictory. While Exelon denies that scour is occurring[143] it nonetheless counts "the passage of major storm producing large amount of scour" as a *benefit*, stating that "scour will extend" the time period before equilibrium.[144] This is an entirely incoherent claim: to save the Upper Chesapeake Bay from some sediment, we must inundate the Upper Chesapeake Bay with millions of tons of sediment and other harmful pollutants.

D. Exelon Fails to Propose Specific Options to Address Scour.

The stated objective of Final Study Report 3.15 was, among other things, to "develop a sediment management plan to include benchmarks for potential impacts and actions, as well as options to manage, mitigate, and remove accumulated sediment."[145] Exelon failed to do so. The discussion of potential options for addressing scour in FSR 3.15 is generalized and vague. It identifies three general categories of options: "1) control volume of sediment entering reservoir, 2) create flow conditions within reservoir to prevent accumulation, or 3) remove sediment that has already been deposited."[146] As noted above, option 1 may reduce the rate at which sediment accumulates behind Conowingo Dam, but it has no effect on scouring, which is the Project's main sediment-

[143] *See* FSR 3.15, *supra*, at ii, 19-21.

[144] *Id*. at 57.

[145] FERC Determination on Modifications, *supra*, at app.B at 2.

[146] FSR 3.15, *supra*, at 46.

related threat to the environment. Option 2 may also be of value once the stored sediment is removed, but it would do nothing to address current and predicted loads and frequencies of scour events. Option 3 is important, but Final Study Report 3.15 barely provides additional detail. Rather than conducting an independent analysis of options for sediment removal, Exelon briefly discusses a 1995 analysis by the Susquehanna River Basin Commission of the potential removal volumes and costs for removal.[147] Exelon's "finding" regarding the potential option of dredging behind the dam states that the "Corps needs to conduct a feasibility study."[148] Yet it is not the Corps' responsibility but Exelon's to study and propose solutions to Project-induced impacts like scour.

In a cursory discussion of one specific option, Exelon implies that mechanical removal of trapped materials may not be appropriate, citing the example of Morgan Falls Hydroelectric Project on the Chattahoochee River in Georgia.[149] That project is not a useful comparison because the project-induced impacts discussed in the Morgan Falls license proceeding concerned the adverse impacts of sedimentation upon recreation within the reservoir, and water quality within the reservoir. The discussion in the Morgan Falls proceeding had nothing to do with preventing large pulses of scoured sediment and nutrients that adversely affect downstream water quality.[150]

The deficiencies in Exelon's proposed sediment management plan stem from its failure to meet the objectives of Final Study Report 3.15. In response to the objections raised by SOLS et al. and state resource agencies, FERC required Exelon to conduct

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[147] *Id.* at 48-49.

[148] *Id.* tbl.5.6-1

[149] *Id.* at 46-47.

[150] FERC, Order Issuing New License. Georgia Power Company. Project No. 2237-017. (FERC Accession No. 20080522-3018, May 22, 2008).

"regular bathymetric surveys and cooperate with the Corps' study to determine benchmarks," and requested that Exelon include a sediment management plan in the FLA "with provisions for establishing benchmarks and any potential actions that may be necessary for continued operation of the project."[151] We reiterate our objection to FERC's contention that "a bathymetric survey every 5 years and continued cooperation with the Corps" is sufficient.[152] First, as noted above, the appropriate time for identifying future benchmarks has already past. Langland in 2009 observed that the Project would trap a lower percentage of incoming sediment as Conowingo Pond fills.[153] As USGS confirmed in 2012, "changes are not just a theoretical issue for future consideration, but are already underway."[154] Moreover, periodic surveys conducted after the relicensing will not ensure that appropriate conditions for preventing scour will be in place at the time of the relicensing. Nor is it sufficient for Exelon merely to cooperate with the Corps-led study. Exelon must also identify and commit to options for preventing scour of accumulated sediment, in order to allow FERC and state agencies to develop appropriate license conditions.

Given Exelon's failure to adequately study this issue in FSR 3.15, it is now unsurprising that Exelon's proposed "Sediment Management Plan" ignores the significance of the reservoir's current and future scour impacts as those impacts relate to the Lower Susquehanna River and Chesapeake Bay. Instead, the Plan only proposes actions to address on-site operational concerns regarding powerhouse intakes, and on-site

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[151] FERC Determination on Modifications, *supra*, at B-6

[152] *Id*.

[153] Langland (2009), *supra*, at 19.

[154] Hirsch (2012), *supra*, at 13.

recreational boat ramps.[155] The proposed "benchmarks for action" are completely unrelated to the impacts of Project-induced scour on the Lower Susquehanna River watershed or Chesapeake Bay water quality. These failures have made it impossible for SOLS et al. and other members of the public to provide meaningful and timely input regarding benchmarks for action to address scour, which is a key issue affecting the Final License Application.

E. Recommendations for License Conditions Regarding Project-Induced Scour.

To summarize, scouring from the Project's reservoir is already having a harmful impact on the Lower Susquehanna River and Chesapeake Bay. But for the existence and continued operation of the Project, millions of tons of additional and unnatural quantities of sediment and nutrients due to scouring would not be dumped during large storms. The only way to prevent scour is to remove the material that has built up behind the Dam. To address this problem, SOLS et al. propose that any renewed license include conditions for removing at least 4 million tons of sediment annually from Conowingo Pond, in order to offset the 1.5-2 million tons currently being deposited annually, and to eventually remove all material from the reservoir that would be vulnerable to scouring during the proposed license period.

Finally, we note that FERC has a broad "right upon or after the expiration of any license to take over and thereafter to maintain and operate any project," after providing the required notice and payment to the licensee.[156] Given the impact that the Project now imposes and stands to impose in the future upon the nation's largest estuary, and given

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[155] FLA, *supra*, ex.E app.C at 3-4.

[156] 16 U.S.C. § 807(a).

Exelon's continued apathy regarding the serious impacts of scouring, SOLS et al. submit that FERC can and should actively evaluate the option of recapturing the Project license.

III. CONTINUED CLOSURE OF THE DAM'S CATWALK IS UNJUSTIFIED.

SOLS et al. urge FERC to conduct a thorough review of alternatives for restoring access to the Dam's catwalk, and to closely consider the impacts on the human environment that would stem from Exelon's proposal to maintain its closure of the catwalk, in the environmental impact statement under NEPA. We strongly disagree with Exelon's assertion that its "studies confirm that recreational fishing facility capacity at the Project will satisfy projected demands during the term of the next license."[157] As Exelon acknowledges, having the catwalk reopened was highest on the list of concerns expressed by users of existing recreational sites.[158] Because Exelon did not seek input from former users of the catwalk, and because most former users of the catwalk have reportedly stopped using any of the Project area for recreational purposes, the responses by remaining users of existing facilities most likely did not provide a full understanding of the recreational demand for the catwalk.[159] In personal communications with former users of the catwalk, Lower Susquehanna Riverkeeper has been informed that one of the reasons for this is that older individuals who fished from the catwalk face greater physical difficulty casting from the western shore and the fishing wharf.[160] In addition, few of the areas' prized fish species, striped bass, are caught from the new fishing wharf. Exelon's

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[157] FLA, *supra*, ex.E app.A at 11.

[158] *Id*. at E-300.

[159] FLA, *supra*, ex.E app.A at 11.

[160] One concern that we have with the catwalk is the return of fish to the river below. To reduce any potential injury to the released fish, a pair of simple slides or flumes could be installed at the catwalks for little cost to allow the released fish safer passage back into the waters below than dropping them from the height of the catwalk.

assertion that the existing facilities fulfill the recreational demands of the region is therefore conclusory and lacks a rational basis.

For decades since the inception of the Project, the catwalk has been a significant part of the local and regional culture. Residents and visitors enjoyed the unique viewing and recreational opportunities provided by the catwalk. In fact, local residents understood the construction of the catwalk to have been based on a permanent commitment by the original dam operators to the region's families to maintain that facility as a sort of compensation for the loss of access occasioned by the construction of the Project.[161]

Exelon's insistence on keeping the catwalk closed on the basis of security is arbitrary. U.S. Route 1 traverses the Susquehanna River over the top of Conowingo Dam, and is open to all. We see no rational basis for concluding that access to the catwalk would pose a greater threat to security than the open and unrestricted access of tractor trailers and cars to the highway that runs atop the dam. The fact that catwalks at comparable hydropower facilities have been kept open (including those upriver of the Project, namely York Haven Hydroelectric Project - FERC No. 1888, and Safe Harbor Hydroelectric Project - FERC No. 1025) further calls into question Exelon's supposed security reasons for keeping the catwalk closed.

Finally, Exelon's analysis of the costs of providing security to allow for restored access to the catwalk appears to include modifications that are unrelated to security.[162] We therefore urge FERC to conduct an independent analysis of alternatives for restoring access to the dam's catwalk.

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[161] Letter from Jere Hess re Trying to reopen the fishing platform (catwalk) on the Conowingo Dam for the Fisherman and their families (FERC Accession No. 20090714-0028, July 7, 2009).

[162] FLA, *supra*, ex.E app.A at 11

CONCLUSION

For the foregoing reasons, if FERC issues the proposed renewed license for Project No. 405-106, it should include the conditions to ensure the following:

(1) Permanent volitional up- and downstream passage for American eel,

(2) Upstream trap-and-transport as an interim measure until volitional upstream passage is operational,

(3) Removal of sediment from Conowingo Pond sufficient to prevent scouring during the duration of the license period, and

(4) Restored access to the Dam's catwalk.

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Respectfully Submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this 31st day of January, 2014, I have served the foregoing document and its attachments upon each person designated on the official service list compiled by the Secretary in this proceeding.

/s/Jennifer C. Chavez
Jennifer C. Chavez