153 FERC ¶ 62,233
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

York Haven Power Company, LLC Project No. 1888-030

ORDER ISSUING NEW LICENSE

(December 22, 2015)

INTRODUCTION

1. On August 30, 2012, York Haven Power Company, LLC (York Haven Power) filed, pursuant to sections 4(e) and 15 of the Federal Power Act (FPA), an application for a new license to continue operation and maintenance of the York Haven Hydroelectric Project No. 1888 (York Haven Project or project).[1] The project's authorized capacity being licensed is 19.62 megawatts (MW). The project is located on the Susquehanna River in York, Dauphin, and Lancaster Counties, Pennsylvania.[2] The project does not occupy federal land.

2. As discussed below, this order issues a new license for the project.

BACKGROUND

3. The York Haven Project is one of five hydroelectric projects located on the lower Susquehanna River and, with its dam at river mile (RM) 55, is the most upstream. Proceeding downstream from the project are the 380.39-MW Safe Harbor Hydroelectric Project No. 1025 (Safe Harbor Project) with its dam at RM 33, the 195.5-MW Holtwood Hydroelectric Project No. 1881 (Holtwood Project) with its dam at RM 25, the 800-MW Muddy Run Pumped Storage Project No. 2355 (Muddy Run Project) with its powerhouse at RM 22, and the 574.54-MW Conowingo Hydroelectric Project No. 405 (Conowingo Project) with its dam at RM 10.

[1] 16 U.S.C. §§ 797(e) and 808 (2012).

[2] The Susquehanna River is a navigable waterway of the United States. *See Metropolitan Edison Co.*, 2 F.P.C. 703 (1940). Therefore, section 23(b)(1) of the FPA, 16 U.S.C. § 817(1) (2012), requires the project to be licensed.

4. The Federal Power Commission, the Commission's predecessor, issued an original license for the project on November 7, 1944, by an unpublished order.[3] The Commission issued a new major license for the project on August 14, 1980, and the license expired on September 1, 2014.[4] Since then, York Haven Power has operated the project under an annual license pending the disposition of its new license application.

5. On April 29, 2013, the Commission issued a public notice that was published in the *Federal Register* accepting the application for filing, indicating the application was ready for environmental analysis, and setting June 28, 2013, later extended to January 31, 2014, as the deadline for soliciting motions to intervene and protests, comments, recommendations, preliminary terms and conditions, and preliminary fishway prescriptions.[5]

6. The U.S. Department of the Interior (Interior); Susquehanna River Basin Commission (SRBC); Pennsylvania Department of Environmental Protection (Pennsylvania DEP); Pennsylvania Fish and Boat Commission (Pennsylvania FBC); and Maryland Department of Natural Resources (Maryland DNR) and Maryland Department of the Environment (Maryland DOE), collectively; filed notices of intervention.[6] PPL Brunner Island, LLC (Brunner Island);[7] Safe Harbor Water Power Corporation; PPL Holtwood, LLC; Exelon Generation Company, LLC (Exelon); The Nature

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[3] The original license was issued to Metropolitan Edison Company and subsequently transferred to York Haven Power.

[4] *York Haven Power Company*, 21 FERC ¶ 61,430 (1982). (Although the order was issued in 1980, the order itself was not published in the FERC reports until 1982.)

[5] 78 Fed. Reg. 26,345 (May 6, 2013). *See also* Request for Extension of Time and Notice of Updated Hydro Licensing Processing Schedule issued June 14, 2013; Notice Granting Extension of Time and Intent to Prepare and Environmental Impact Statement issued August 30, 2013; and Notice Granting Extension of Time issued December 13, 2013.

[6] Under Rule 214(a) of the Commission's Rules of Practice and Procedure, Interior, SRBC, Pennsylvania DEP, Pennsylvania FBC, Maryland DNR, and Maryland DOE became parties to the proceeding upon timely filing of their notices of intervention. 18 C.F.R. § 385.214(a) (2015).

[7] Brunner Island filed its motion to intervene on November 13, 2012. Motions to intervene filed after an application has been filed but before notice has been issued are considered timely.

Conservancy; and American Rivers filed timely motions to intervene.[8] New Energy Capital Partners, LLC (New Energy) timely filed a motion to intervene on October 21, 2013, and York Haven Power filed an answer in opposition to New Energy's motion on November 4, 2013. On June 12, 2014, New Energy's motion to intervene was granted.[9]

7. Lancaster County Conservancy, Interior, The Nature Conservancy, and American Rivers filed comments and recommendations. No entity opposes relicensing the project.

8. On January 30, 2014, York Haven Power filed an Offer of Settlement (Agreement). Signatories to the Agreement were York Haven Power, U.S. Fish and Wildlife Service (FWS), Pennsylvania FBC, Maryland DNR, and SRBC. The Agreement states that it resolves all issues among the signatories pertaining to the relicensing of the York Haven Project, including upstream passage of American shad and American eel, downstream passage of juvenile and post-spawning American shad, downstream passage of silver stage American eel, resident fish passage, flow management, water quality and debris management, and endangered species and species of special concern. Because the Agreement does not address other environmental resources, such as recreation, land use, and cultural resources, it is assumed the measures proposed in the final license application for these resources continue to represent York Haven Power's proposal. According to the Agreement's Explanatory Statement, section 3.0 contains measures that the signatories agree should be incorporated as articles into the new license. Section 4.0 includes miscellaneous provisions that are not intended to be part of the new license.

9. The Commission issued public notice of the Agreement on February 19, 2014. On February 19, 2014, Brunner Island filed a protest and comments in opposition to the Agreement, expressing concern about debris management and the amount of water that would be available for operation of its downstream Brunner Island Steam Electric Station. York Haven Power responded on March 4, 2014. On December 29, 2014, Brunner Island withdrew its protest and comments in opposition, noting that subsequent talks with York Haven Power had improved its understanding of the Agreement's implications.

10. On July 30, 2014, Commission staff issued a draft multi-project Environmental Impact Statement (EIS) that, among other things, analyzed the proposed project's impacts

[8] Timely, unopposed motions to intervene are granted by operation of Rule 214(c) of the Commission's Rules of Practice and Procedure. 18 C.F.R. § 385.214(c) (2015).

[9] *See* Secretary's Notice Granting Intervention issued June 12, 2014; 18 C.F.R. § 385.214(c)(2) (2015).

and alternatives, including the measures proposed in the Agreement.[10] Comments on the draft EIS related to the York Haven Project were filed by: Pennsylvania Game Commission; Hugh Rogers; New Energy; York Haven Power; FWS/Susquehanna River Anadromous Fish Restoration Cooperative; Chesapeake Bay Foundation and Midshore Riverkeeper Conservancy, collectively; Onondaga Nation; Interior; Exelon; State of Maryland; Dr. Amy Roe; National Marine Fisheries Service (NMFS); U.S. Environmental Protection Agency (EPA); SRBC; The Nature Conservancy; American Rivers; Stewards of the Lower Susquehanna, Lower Susquehanna Riverkeeper, and Waterkeepers Chesapeake, collectively; and Clean Chesapeake Coalition.

11. On March 11, 2015, Commission staff issued a final EIS. Comments on the final EIS were filed by EPA, NMFS, The Nature Conservancy, Interior, Clean Chesapeake Coalition, SRBC, and York Haven Power.

12. The interventions, comments, and recommendations have been fully considered in determining whether, and under what conditions, to issue this license.

PROJECT DESCRIPTION

A. Project Area

13. The project is located on the Susquehanna River in York, Dauphin, and Lancaster Counties in south central Pennsylvania. The project powerhouse is located at RM 55, about 17 miles downstream of the city of Harrisburg. The Three Mile Island Nuclear Station, owned by Exelon, is located on Three Mile Island, within Lake Frederic, the York Haven Project's impoundment. A coal-fired steam electric generating plant, the Brunner Island Electric Steam Station, is located about 1.5 miles downstream of the project.

B. Project Facilities

14. The York Haven Project includes York Haven Dam, which consists of five integrated structures linked linearly across the Susquehanna River from its western shore to the eastern shore of Three Mile Island. The total length of the dam, including the integral powerhouse, is about 9,080 feet. Starting on the western shore of the Susquehanna River, York Haven Dam includes a 475-foot-long boulder masonry and concrete west forebay dam and retaining wall, and a 115-foot-long boulder masonry south forebay dam and sluice gate, which help form the project's forebay. Integral to these forebay dams and parallel to the river's western bank is a 472-foot-long by

[10] The EIS also considered the impacts of the Muddy Run Project and the Conowingo Project, which are also located on the lower Susquehanna River.

48-foot-wide brick and stone masonry powerhouse that includes 20 turbine-generator units (6 vertical shaft propeller turbines and 14 horizontal Francis turbines) and appurtenant equipment. Water flowing into the forebay is directed through the powerhouse's turbines and then discharged into the Susquehanna River immediately downstream of the powerhouse. Extending upstream from the north end of the powerhouse, and parallel to the river bank, is a 3,000-foot-long stone masonry headrace wall, known as the east forebay dam, which forms the eastern side of the forebay and serves to direct water to the powerhouse. A 4,970-foot-long concrete-covered rock fill and timber main dam is attached to the headrace wall and runs from the north end of the headrace wall, diagonally across the main channel of the Susquehanna River, to the western shore of Three Mile Island. The main dam has a maximum height of 18 feet at its crest and an average height of 10 feet. Together, these structures form the project's impoundment, Lake Frederic.

15. Lake Frederic is 3.5 miles long with 29 miles of shoreline within the project boundary, including the shorelines of its islands. At the normal water surface elevation of 277.86 feet,[11] Lake Frederic has a surface area of 2,218 acres and a gross storage capacity of 9,600 acre-feet.

16. On the east side of Three Mile Island, the project includes a 928-foot-long east channel dam that extends from the eastern shore of Three Mile Island, across the east channel of the Susquehanna River, to the eastern shore of the Susquehanna River. The east channel dam has an average height of 9 feet and supports an east channel upstream fish passage facility that has been operated since April 2000. The fish passage facility consists of a vertical slot fish ladder at the western end of the east channel dam.

17. The York Haven Project includes an outdoor switchyard located just downstream of the forebay. The switchyard includes the station's transformers that step up the project's voltage for connection to the 115-kilovolt (kV) electric grid. There are no primary transmission lines included as part of the project because it interconnects with the electric grid at the switchyard.

18. York Haven Power owns and operates seven project recreation facilities: the East Shore Boat Launch and Canal Lock recreation area, the Goosehorn Island Picnic Area, the Shelley Island Recreation Area, the Goodling Island Picnic Area, the Battery Island Picnic Area, the York Haven Power Plant Recreation Area, and a canoe portage trail.[12]

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[11] All elevations are referenced to the National Geodetic Vertical Datum of 1929.

[12] Also within the York Haven Project boundary are three non-project boat launches owned and operated by public entities: the Newberry Township boat launch, the Goldsboro Borough boat launch, and the Pennsylvania FBC boat launch.

C. Current Project Operation

19. The project is operated generally in a run-of-river mode. During normal operation, generating units are brought on-line based on anticipated inflow rates. Project outflow adjustments typically occur in 700 to 1,100 cubic feet per second (cfs) increments, up to the station's hydraulic capacity of 17,000 cfs.

20. During low to moderate flow conditions, defined as less than 17,000 cfs, the project is capable of maintaining run-of-river operation and a virtually constant impoundment water level of 277.9 feet.[13] Under low to moderate-flow conditions, York Haven Power is permitted under the current license to draw down the impoundment by up to 1.10 feet, which typically only occurs for dam maintenance purposes.

21. When river inflow exceeds the hydraulic capacity of the turbines (approximately 60 percent of the time), the impoundment elevation rises above the normal pool elevation, depending on inflow, and any excess water overtops the main dam, east channel dam, and headrace walls.

22. Article 30 of the current license requires York Haven Power to provide a year-round continuous minimum flow of 1,000 cfs, or inflow, whichever is less, and an average daily minimum flow of 2,500 cfs, or inflow, whichever is less. York Haven Power maintains the minimum flow requirements through a combination of keeping at least two units in operation and allowing spill to occur over the main dam.[14] These minimum flows can be temporarily modified if required by operating emergencies beyond the control of York Haven Power.

23. Pursuant to a 1997 license amendment,[15] York Haven Power provides flows at the east channel fish passage facility to support the upstream migration of adult American shad (typically from mid-April to mid-June). These flows include a spill of 4,000 cfs at the main dam and the release of 2,000 cfs at the east channel dam, which includes 67 cfs

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[13] The value 277.9 represents the low point of the main dam, which under current operation is considered the normal elevation when river flows are less than the maximum turbine capacity.

[14] Although not required by the current license, York Haven Power also provides a minimum flow of 1,000 cfs downstream of the project on the west side of the river for the benefit of the Brunner Island cooling water intake, located downstream of the project powerhouse.

[15] *See* 80 FERC ¶ 62,294 (1997).

through the fish ladder.[16] At the conclusion of the American shad upstream passage season, pursuant to a June 2010 Consent Order and Agreement (Consent Order) between York Haven Power and Pennsylvania DEP,[17] York Haven Power maintains a minimum flow of 400 cfs in the east channel to enhance resident fish passage until the seasonal closure of the fishway.[18]

D. Proposed Streamflow and Fish Passage–Related Environmental Measures

1. Measures Proposed Under the Terms of the Agreement

24. Under the terms of the Agreement, York Haven Power will implement the following environmental measures at the project, as detailed in section 3 of the Agreement. The timing and duration of some measures are linked to when a nature-like fishway,[19] included as part of the Agreement, is completed and operational. Construction of the nature-like fishway is expected to be completed in 2021.

25. To protect aquatic resources, York Haven Power will continue to deliver through the powerhouse a year-round continuous minimum flow of 1,000 cfs or inflow, whichever is less, and an average daily minimum flow of 2,500 cfs, or inflow, whichever is less. When inflow to the project is less than 3,000 cfs, York Haven Power will operate the project in run-of-river mode, without deliberate impoundment drawdown or storage for purposes of generating electricity.

26. To provide for upstream fish passage prior to completion of the nature-like fishway, York Haven Power will continue to operate and maintain the existing east channel fishway as the primary means for upstream fish passage.

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[16] Flows at the east channel dam are provided by two wheel gates adjacent to the fish ladder that can each pass a 1,000 cfs attraction flow for the fish ladder.

[17] On June 16, 2010, York Haven Power entered into a Consent Order with Pennsylvania DEP to resolve issues related to the Water Quality Certification required for relicensing the project. The Consent Order is attached as Appendix I to the Agreement.

[18] Fishway closure occurs on December 15th or when the average daily river water temperature is equal to or less than 40 degrees Fahrenheit for three consecutive days.

[19] A nature-like fishway is designed to appear and operate similar to a natural riffle, with a gradually sloping channel interspersed with rock weirs and pools.

27. To enhance upstream fish passage prior to completion of the nature-like fishway, York Haven Power will continue to provide a minimum flow of 2,000 cfs at the east channel dam and a spill flow of 4,000 cfs at the main dam during the American shad upstream passage season.

28. To provide for the upstream passage of resident fish species prior to completion of the nature-like fishway and pursuant to the June 2010 Consent Order, York Haven Power will continue to maintain a minimum flow of 400 cfs in the east channel downstream of the east channel fishway from the end of the American shad upstream passage season until the end of the resident fish passage season.

29. To provide for the downstream passage of juvenile American shad, York Haven Power will continue its current downstream juvenile American shad passage protocol that includes provisions for operating units 1 through 6 first online and last offline during the juvenile shad downstream migration period, and opening the forebay sluice gate at specific times for downstream fish passage. If river flows exceed the capacities of units 1 through 6, unit 14 will be operated, and if flows exceed the capacities of units 1 through 6 and 14, units 7 through 13 and 15 through 20 will be operated in ascending order.

30. To improve upstream fish passage, York Haven Power will construct, operate, and maintain a nature-like fishway in the vicinity of the apex of the main dam and Three Mile Island, in compliance with design criteria specified in Appendix A of the Agreement, which will become the primary means of upstream fish passage at the project. Prior to and upon completion of the nature-like fishway, York Haven Power will: (a) develop an erosion and sediment control plan for construction of the nature-like fishway; and (b) conduct vegetation surveys, wetlands delineations, invasive species surveys, rare species surveys, bog turtle habitat assessments, and bald eagle surveys in the area to be affected by the nature-like fishway.[20]

31. To facilitate passage through the nature-like fishway during the American shad upstream passage season, York Haven Power will provide at least 5 percent of the total river flow through the nature-like fishway and supplemental attraction flow channel[21]

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[20] On May 7, 2015, York Haven Power filed the results from its wetland delineation and stream identification, cover type mapping and invasive plant, botanical, and bog turtle habitat assessment surveys.

[21] The supplemental attraction flow channel will be located on the Three Mile Island side of the nature-like fishway. It is designed to provide additional flow that cannot be delivered through the main fishway channel itself and is composed of an upper inclined trashrack, roughly 60-feet long and 10-feet tall; a headgate section with electrical gate operators approximately 15-feet tall; a flume section; and a 83-foot-long, broad-crested weir outlet control, having an overall length of almost 900 feet.

when flows entering the project are between 5,000 and 150,000 cfs. This equates to a minimum flow through the nature-like fishway of between 1,000 and 7,500 cfs depending on inflow. Outside of the American shad upstream passage season, York Haven Power will provide a minimum flow of 200 cfs through the nature-like fishway when the river elevation is at the crest of the main dam. When flows exceed the combined hydraulic capacity of all available generating units, York Haven Power will manage flows, to the extent controllable, to maximize flow over the main dam and the nature-like fishway in order to provide attraction flow to the vicinity of and from the nature-like fishway to maximize the fishway's effectiveness.

32. To facilitate the downstream passage of post-spawning adult American shad and juvenile American shad, York Haven Power will reallocate the existing minimum flows to pass about 370 cfs through the forebay sluice gate, to the extent practicable, for 1 or 2 hours in the morning during weekdays from May 1 through June 30, if river flows exceed the sum of: (1) the combined hydraulic capacity of the project's generating units; (2) flows through the nature-like fishway, once constructed; (3) flows through the east channel; and (4) flows (if any) over the main dam.

33. To facilitate the downstream passage of juvenile American shad both prior to and after construction of the nature-like fishway, York Haven Power will pass about 370 cfs through the forebay sluice gate between the hours of 5 p.m. and 11 p.m. during the entire juvenile American shad passage period, and for 1 or 2 hours in the morning, to the extent practicable, for any day during the juvenile American shad passage season that river flows exceed the sum of: (1) the combined hydraulic capacity of the project's generating units; (2) flows through the nature-like fishway, once constructed; (3) flows through the east channel; and (4) flows (if any) over the main dam.

34. To protect outmigrating juvenile and adult American shad that pass into the downstream plunge pool, York Haven Power will develop designs within 4 years of license issuance for: (1) removal of obstructions in or deepening of the plunge pool below the forebay sluice gate, and (2) a chute structure to convey flows beyond the roadway on the downstream side of the stone masonry forebay bulkhead wall to allow juvenile and adult American shad to land unimpeded in the downstream pool.

35. To protect outmigrating adult American eels, York Haven Power will: (1) provide for the downstream passage of silver eels and meet a downstream eel passage goal (survival of 85 percent of silver eels from above York Haven Dam to below the dam and powerhouse); (2) cooperate with resource agencies and other interested parties in the conduct of Interior's Lower Susquehanna River Downstream Eel Study that would

include monitoring silver eels at the project;[22] (3) conduct a downstream passage effectiveness study (site-specific downstream eel study) as described in appendices G and H of the Agreement; and (4) conduct a downstream eel passage improvement study if downstream eel passage goals are not achieved with provisions for subsequent monitoring and adjustments.

36. To ensure that effective upstream passage is provided for adult American shad, York Haven Power will conduct American shad upstream passage effectiveness studies, using radio telemetry, beginning during the second year of nature-like fishway operation. If the project area passage success criterion is not achieved, York Haven Power will implement corrective measures, followed by two additional years of radio telemetry studies to confirm achievement of the success criterion.

37. To minimize turbine entrainment of juvenile American shad, York Haven Power will conduct a juvenile American shad headrace turbine avoidance study consistent with design criteria included in Appendix D of the Agreement. If the juvenile American shad headrace turbine avoidance goals are not achieved, York Haven Power will implement measures to enhance the effectiveness of downstream juvenile shad passage and conduct a supplemental juvenile American shad headrace turbine avoidance study within 2 years of implementing the measures.

38. After completion of the nature-like fishway and to protect aquatic resources in the east channel and provide a minimum passage flow for fish ascending the east channel and using the east channel fishway, York Haven Power will provide an average daily minimum flow in the east channel below the east channel dam of 267 cfs year round.

39. To prevent a buildup of debris in the project forebay, York Haven Power will remove non-natural debris from the forebay, and sluice remaining natural debris downstream through a gated opening at the downstream end of the forebay, after notifying the downstream Brunner Island Electric Steam Station.

40. To provide for debris removal in the lower Susquehanna River watershed, York Haven Power will contribute $25,000 per year for this purpose to the York County Conservation District or such other entity identified by Pennsylvania DEP.

[22] As part of the off-license provisions included in section 4.1 of the Agreement, York Haven Power also will contribute a sum of $25,000 to be used by the resource agencies to help in the conduct of the Lower Susquehanna River Downstream Eel Study, and, if determined necessary, York Haven Power will provide $50,000 to resource agencies for collection and tagging of silver eels at upstream locations.

2. Other Proposed Environmental Measures

41. York Haven Power proposes to maintain existing project recreation facilities and consult with the resource agencies on recreation management every 10 years after the effective date of any new license.

42. To enhance shoreline resources, York Haven Power proposes to continue the current permitting program for the approximately 300 permitted lots located within the project boundary, but terminate permits and remove from the permitting program existing lots upon abandonment by the permittee, or when existing structures become damaged and are not replaced by structures conforming to applicable federal, state, and local regulations.

43. To protect historic resources, York Haven Power proposes to implement a Historic Properties Management Plan (HPMP) filed with the Commission on December 28, 2012, to manage project effects on historic properties eligible for listing in the National Register of Historic Places (National Register).

E. Project Boundary

44. The existing York Haven Project boundary encloses an area of approximately 3,220 acres, including Lake Frederic. The project boundary is generally located at a 200-foot offset from the 282.5-foot contour elevation, as measured from the river. All of the islands within Lake Frederic are within the project boundary, except for the portion of Hill Island located above the 282.5-foot contour, and the northern portion of Three Mile Island where the Three Mile Island Nuclear Station is located. The project boundary also encloses the land occupied by the project facilities, including the York Haven Dam, powerhouse, east channel dam, and the following project recreation facilities: the Goosehorn Island Picnic Area, the Shelley Island Recreation Area, the Goodling Island Picnic Area, the Battery Island Picnic Area, the York Haven Power Plant Recreation Area, and a canoe portage trail. The East Shore Boat Launch and Canal Lock recreation area is a project recreation facility; however, the current project boundary does not encompass the site's entire parking area and historic canal lock.

45. York Haven Power proposes to add 1.9 acres to the York Haven Project boundary in order to encompass the entire East Shore Boat Launch and Canal Lock recreation area.

SUMMARY OF LICENSE REQUIREMENTS

46. As summarized below, this license, which authorizes 19.62 MW of renewable energy, requires a number of measures to protect and enhance water quality, fish, wildlife, threatened and endangered species, recreation, and cultural resources at the project.

47. To protect and enhance water quality, fisheries, and other aquatic resources, the license requires the Agreement measures, discussed above, through license articles and conditions found in the Pennsylvania DEP's Water Quality Certification (certification) (Appendix A) and Interior's fishway prescription (Appendix B).

48. To minimize impacts on bald eagles and their habitat, the license requires York Haven Power to consult with FWS about the construction of the nature-like fishway and comply with the most current FWS' *National Bald Eagle Management Guidelines*.

49. To minimize impacts to the federally threatened northern long-eared bat, the license requires York Haven Power to limit tree clearing to the winter hibernation months.

50. To protect recreation resources, the license requires York Haven Power to develop a recreation management plan for maintaining and monitoring project recreation opportunities.

51. To protect shoreline resources, the license requires York Haven Power to develop a shoreline management plan (SMP) to ensure project shorelines are managed to protect scenic, recreational, and environmental values.

52. To protect cultural resources, the license requires York Haven Power to modify its draft HPMP per the Programmatic Agreement (PA) that was executed on April 21, 2015.[23]

WATER QUALITY CERTIFICATION

53. Under section 401(a)(1) of the Clean Water Act (CWA), the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency has either issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed 1 year.[24] Section 401(d) of the CWA provides that the certification shall become a condition of any federal license that authorizes construction or operation of the project.[25]

[23] *See* August 3, 2015 Commission staff transmittal of executed Programmatic Agreement.

[24] 33 U.S.C. § 1341(a)(1) (2012).

[25] 33 U.S.C. § 1341(d) (2012).

54. On August 29, 2013, York Haven Power applied to Pennsylvania DEP for certification for the York Haven Project. Pennsylvania DEP received this request on August 29, 2013. Pennsylvania DEP issued certification for the York Haven Project on August 19, 2014. The conditions include: a project description (section I), seven provisions that are general or administrative (section II, A through G), and seven project-specific provisions. The project-specific provisions include four provisions concerning fish passage (section III, A through D), two provisions concerning minimum flows (section IV, A and B), and a provision concerning debris management (section V). The conditions, which are consistent with the measures in the Agreement, are set forth in Appendix A of this order, and incorporated into this license by Ordering Paragraph (D).

55. In the EIS, Commission staff did not recommend the measure that requires an annual $25,000 contribution to the York County Conservation District, or another entity to be identified by Pennsylvania DEP, for debris removal in the lower Susquehanna River watershed (Condition V.A.2)[26] because almost all of the debris arrives at the York Haven Project and passes over the main dam during high-flow events when river flows far exceed the hydraulic capacity of the project. York Haven Power currently removes the non-natural debris that accumulates in the forebay, and the remaining debris is sluiced downstream. Commission staff, therefore, concluded that York Haven Power has no control over the quantity of debris that flows downstream or where it is deposited and that the proposed measure does not appear to be related to any specific project effect. However, this condition is included in the license pursuant to section 401 of the CWA.

COASTAL ZONE MANAGEMENT ACT

56. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its receipt of the applicant's certification.[27]

57. By email dated December 10, 2009, and filed December 15, 2009, Pennsylvania DEP notified Commission staff that the project "…is located outside of Pennsylvania's Lake Erie and Delaware Coastal Zones, and will not impact upon them." Therefore, no consistency certification is required.

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[26] *See* final EIS at 400-01.

[27] 16 U.S.C. § 1456(c)(3)(A) (2012).

SECTION 18 FISHWAY PRESCRIPTIONS

58. Section 18 of the FPA provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate.[28]

59. On January 30, 2014, Interior timely filed a preliminary fishway prescription for the York Haven Project that includes conditions consistent with the Agreement.[29] On April 17, 2015, Interior filed comments on the final EIS, stating that it supports the Agreement and the Pennsylvania DEP-issued certification for the York Haven Project. Interior did not indicate whether it would file a final fishway prescription. Because Interior has not filed a modification or withdrawn its preliminary prescription, this order treats the preliminary fishway prescription as final.

60. The fishway prescription requires York Haven Power to: (1) provide flows at the project consistent with the Agreement; (2) develop fishway operating procedures, including schedules, for each fishway; (3) construct a nature-like fishway at the main dam by November 30, 2021; (4) conduct monitoring and effectiveness studies for the nature-like fishway to ensure that at least 75 percent of the shad passed at the downstream Safe Harbor Project are passed at the York Haven Project, or that at least 85 percent of the shad that arrive in the York Haven Project area are passed above the York Haven Project; (5) if the project area passage success criterion is not achieved, conduct evaluations and make structural and operational changes, as appropriate; and (6) design the upstream end of the nature-like fishway to accommodate installation of PIT tag monitoring devices when PIT tag monitoring devices are available and feasible for reliably monitoring American shad exiting the nature-like fishway. Interior's fishway prescription is attached to this order as Appendix B and incorporated into the license by Ordering Paragraph (E).

61. By letter filed January 30, 2014, Interior also requested that a reservation of authority to prescribe fishways under section 18 be included in any license issued for the York Haven Project. Consistent with Commission policy, Article 402 of this license reserves the Commission's authority to require fishways that may be prescribed by Interior for the York Haven Project.

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[28] 16 U.S.C. § 811 (2012).

[29] Interior filed a correction to the preliminary fishway prescription on February 7, 2014, that corrected references to the number of generating units at the York Haven Project. Appendix B reflects this correction.

SUSQUEHANNA RIVER BASIN COMMISSION

62. The SRBC was established by the Susquehanna River Basin Compact (Compact), with duties and responsibilities for comprehensive planning, programming, and management of the water and related resources of the Susquehanna River Basin.[30] Commission-issued licenses must meet the comprehensive development/public interest standard of the FPA section 10(a)(1). In addition, under the Compact, projects in the Susquehanna River Basin that are licensed by the Commission "shall not substantially conflict with any…[SRBC] comprehensive plan."[31] Under a 1976 Memorandum of Understanding, the Commission and the SRBC have committed to cooperate in the processing of license applications, to the extent feasible, and the Commission has agreed to give due regard to any recommendations made by the SRBC. [32]

63. The SRBC intervened in the relicensing proceeding, stating that it "generally supports" the York Haven Project.[33] Subsequently, as explained above, the SRBC became a signatory to the Agreement, which resolves all issues among the signatories pertaining to the relicensing of the York Haven Project, including upstream passage of American shad and American eel, downstream passage of juvenile and post-spawning American shad, downstream passage of silver stage American eel, resident fish passage, flow management, water quality and debris management, and endangered species and species of special concern. In addition, as discussed below, Commission staff reviewed SRBC's "Comprehensive Plan for the Water Resources of the Susquehanna River Basin,"

[30] The Compact is a federal interstate agreement among New York, Maryland, Pennsylvania, and the United States. Pub. L. No. 91-575, 84 Stat. 1509 (1970).

[31] As set forth in the conditions and reservations under which the United States consented to participate in the Compact, the Commission's responsibilities and jurisdiction under the FPA and other relevant statutes are not altered, provided that "whenever a comprehensive plan, or revision thereof, has been adopted [by the SRBC]…the exercise of any power conferred by law on any…agency…of the United States with regard to water and related land resources in the Susquehanna River Basin shall not substantially conflict with any such portion of such [SRBC] comprehensive plan… " Compact, Part II, Section 2(r)(2)(ii).

[32] Letter From Sec'y Richard L. Dunham, Fed. Power Comm'n, to Chairman Thomas C. H. Webster, SRBC, approving enclosed Memorandum of Understanding (Nov. 5, 1976) (on file with the Fed. Energy Regulatory Comm'n).

[33] SRBC June 11, 2013 Motion to Intervene at 1.

under section 10(a)(2) of the FPA[34] to consider the extent to which the York Haven Project is consistent with the comprehensive plan and found no conflicts.

THREATENED AND ENDANGERED SPECIES

64. Section 7(a)(2) of the Endangered Species Act (ESA) of 1973 requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of their designated critical habitat.[35]

65. There are three federally listed species with the potential to occur in the vicinity of the York Haven Project: the threatened bog turtle (*Glyptemys [Clemmys] muhlenbergii*), the endangered Indiana bat (*Myotis sodalis*), and the threatened northern long-eared bat (*Myotis septentrionalis*). Additionally, although shortnose and Atlantic sturgeon are known to occur in the Susquehanna River downstream of the Conowingo Project (RM 10), the York Haven Project would have no effect on shortnose and Atlantic sturgeon because these species have not been collected at or passed through the Conowingo fish lifts since they began operation in 1972.[36] NMFS concurred with staff's no effect determination for these species by letter filed September 19, 2014.

66. In the Agreement, York Haven Power agrees to conduct bog turtle habitat assessments and surveys prior to construction of the nature-like fishway, including consultation with resource agencies during permitting to develop mitigation plans, as necessary. Based on this, staff determined that relicensing the project would not be likely to adversely affect the bog turtle.[37] Article 401 requires that the results of York Haven Power's bog turtle habitat assessment, among other reports, be filed with the plans and specifications for the nature-like fishway.

67. Staff also determined that although Indiana bat habitat may occur in the project area, relicensing the project would not be likely to adversely affect the Indiana bat because proposed project activities, including those associated with construction of the nature-like fishway, would result in minimal tree clearing.[38] FWS concurred with staff's

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[34] 16 U.S.C. § 803(a)(2)(A) (2012).

[35] 16 U.S.C. § 1536(a) (2012).

[36] *See* draft EIS at 10 and 240 and final EIS at 16 and 259.

[37] *See* final EIS at 16-17 and 259-60.

[38] *See* draft EIS at 11 and 243 and final EIS at 17 and 261-62.

determination for the Indiana bat by letter filed January 7, 2015, and for the bog turtle by letters filed January 7, 2015, and May 7, 2015.[39]

68. Regarding the northern long-eared bat, staff determined that, although habitat for this species may occur in the project area, relicensing the project would not be likely to jeopardize the continued existence of the northern long-eared bat due to the minimal tree clearing required for nature-like fishway construction.[40] Subsequently, the northern long-eared bat was listed as threatened on April 2, 2015, with an effective date of May 4, 2015.[41] By letter to FWS dated August 4, 2015, staff determined that relicensing the project, with a staff-recommended measure requiring York Haven Power to limit tree clearing to the period between October 15 and March 31 in the year when construction commences, would not be likely to adversely affect the northern long-eared bat. FWS concurred with staff's determination for the northern long-eared bat by letter filed August 7, 2015, providing that all tree clearing occur during hibernation months for this species, which is November 15 through March 31 in Pennsylvania.[42] Article 404 requires York Haven Power to restrict any tree clearing to the November 15 through March 31 period to minimize impacts to the northern long-eared bat.

69. Therefore, no further action under the ESA is required for any of the above listed species.

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[39] On May 7, 2015, York Haven Power filed a copy of FWS' concurrence letter dated May 4, 2014, in Appendix E of its report entitled *Phase I Bog Turtle Habitat Assessment at the York Haven Hydroelectric Project, Londonderry Township, Dauphin County, Pennsylvania*.

[40] *See* final EIS at 262-63. At the time of final EIS issuance, the northern long-eared bat was still proposed for listing as a threatened species under the ESA.

[41] 80 Fed. Reg. 17,974-18,033 (2015).

[42] In its August 7, 2015 letter, FWS concurred with staff's determination that the York Haven Project is not likely to affect the northern long-eared bat, and stated that formal consultation is not required. FWS also stated that its concurrence is valid for two years from the date of the letter, and recommended an additional review if the project (i.e., construction of the nature-like fishway) is not completed within two years. However, as there is no foreseeable circumstance that would require staff to change its effects analysis or determination of effect, and FWS does not require an additional review if construction extends beyond August 7, 2017, at this time we consider our responsibilities pursuant to the ESA to be complete.

NATIONAL HISTORIC PRESERVATION ACT

70. Under section 106 of the National Historic Preservation Act (NHPA)[43] and its implementing regulations,[44] federal agencies must take into account the effect of any proposed undertaking on properties listed in or eligible for listing in the National Register (defined as historic properties) and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. This generally requires the Commission to consult with the State Historic Preservation Officer (SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

71. To satisfy these responsibilities, the Commission executed a PA with the Pennsylvania SHPO. The Commission also invited the National Park Service, Delaware Nation, and York Haven Power to concur with the stipulations of the PA. None of the parties filed concurrences.

72. The PA requires the licensee to prepare a final HPMP based on the HPMP filed on December 28, 2012. Commission staff's analysis in the EIS indicated that although the December 2012 HPMP included many standard requirements, some measures contained within the HPMP would benefit from clarification and added detail. In the EIS, staff recommended implementing York Haven Power's proposed HPMP with the following modifications: (1) include a requirement to request access to sites on private lands within the project boundary if project impacts are identified during shoreline monitoring activities, assess these effects, and evaluate the affected sites for listing in the National Register; (2) develop a plan and schedule to survey and record archaeological sites on York Haven Power-owned fee lands in the project boundary and evaluate them for their National Register eligibility to ensure that any effects on sites owned by York Haven Power are fully considered in accordance with section 106 of the NHPA; (3) include two additional sites (36YO300, 36YO334) in the monitoring schedule, or clarify why they were excluded; (4) update section 3.3.1 (*Policy: Inadvertent Discoveries*) to state that activities will be halted if an archaeological site or object(s) is inadvertently discovered; (5) include the National Park Service as a consulting party; and (6) include a provision to review the HPMP every 5 years with consulting parties.[45]

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[43] Section 106 of the NHPA, as amended, 54 U.S.C. § 306108, Pub. L. 113-287, 128 Stat. 3188 (2014). (The National Historic Preservation Act was recodified in Title 54 in December 2014).

[44] 36 C.F.R. Part 800 (2015).

[45] *See* final EIS at 399-400.

73. The executed PA requires the measures recommended in the EIS. It also requires an update to the HPMP's provision addressing inadvertent discoveries, as well as the addition of a provision to review and update the HPMP every 5 years, to be done in consultation with the Pennsylvania SHPO and Delaware Nation.

74. Execution of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 407 requires the licensee to implement the PA and update the HPMP within 6 months.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES PURSUANT TO SECTION 10(j) OF THE FPA

75. Section 10(j)(1) of the FPA[46] requires the Commission, when issuing a license, to include conditions based on recommendations submitted by federal and state fish and wildlife agencies pursuant to the Fish and Wildlife Coordination Act,[47] to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

76. In response to the April 29, 2013 public notice that the project was ready for environmental analysis, Interior filed two recommendations under section 10(j).[48] This license includes conditions consistent with the two recommendations, which are within the scope of section 10(j). The recommendation to cooperate with FWS and other interested parties in the funding, planning, and conduct of Interior's Lower Susquehanna River Downstream Eel Study to evaluate the timing, magnitude, duration, annual variation, and environmental conditions associated with the active migration of silver eels through the Susquehanna River to the Chesapeake Bay is incorporated into this license pursuant to Pennsylvania DEP's certification (condition III.C.2.b [Appendix A]) and the fishway prescription (Appendix B condition 9.9.7.b). The minimum stream flow recommendation also is incorporated into this license pursuant to Pennsylvania DEP's certification (conditions IV.A.1.c and IV.B.3 [Appendix A]).

SECTION 10(a)(1) OF THE FPA

77. Section 10(a)(1) of the FPA requires that any project for which the Commission issues a license be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the

[46] 16 U.S.C. § 803(j)(1) (2012).

[47] 16 U.S.C. §§ 661 *et seq*. (2012).

[48] Interior filed the recommendations on January 30, 2014.

improvement and utilization of waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.[49]

78. The licensee's proposal and staff's recommendations for bald eagles, a recreation management plan, a shoreline management plan, and changes to the project boundary are considered under the broad public interest standard of section 10(a)(1) of the FPA.

A. Bald Eagles

79. The bald eagle is protected under the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Bald eagles are known to forage, roost, and nest along the Susquehanna River, and within the project area. In its license application, York Haven Power discussed the potential presence of a bald eagle nest on the southern end of Three Mile Island, but provided no detail on its location.[50]

80. In the final EIS, staff determined that there are no current or proposed project-related activities that would affect bald eagles, including changes to minimum flows or new recreational facilities.[51] Additionally, as part of the Agreement, York Haven Power agreed to conduct a bald eagle survey prior to construction of the nature-like fishway, and to consult with the resource agencies during permitting and development of mitigation plans, as necessary. Article 401 requires that the results of York Haven Power's bald eagle survey, among other reports, be filed with the plans and specifications for the nature-like fishway.

81. However, in a letter filed August 7, 2015, FWS indicates that a bald eagle nest is present less than 0.5 mile from the project and about 0.25 mile from the proposed limits of disturbance for construction of the nature-like fishway, and states that bald eagle population increases along the Susquehanna River may result in the establishment of additional bald eagle nests within the project vicinity. FWS recommends that York Haven Power refer to FWS' *National Bald Eagle Management Guidelines* (May 2007),[52] and if it appears that disturbance may occur due to construction or maintenance activity,

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[49] 16 U.S.C. § 803(a)(1) (2012).

[50] *See* final EIS at 232 and 238.

[51] *See* final EIS at 245.

[52] *See* http://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf.

modify the activity consistent with its guidelines and conservation measures as noted on the FWS' website.[53]

82. Based on the documented presence of a bald eagle nest near the location of the proposed nature-like fishway, and the likelihood of increased bald eagle activity within the project boundary in the future, construction of the nature-like fishway may have the potential to affect the bald eagle, depending on the location of foraging, roosting, or nesting habitat of the species in proximity to the project activity. Therefore, Article 403 requires FWS' recommended bald eagle measures.

B. Recreation Management

83. Project recreation facilities include boat launches, fishing platforms, a portage trail, nature trails, and multiple day-use areas with picnic facilities and ball courts. York Haven Power proposes a number of operational and maintenance activities related to recreation, such as maintaining the canoe portage trail, fishing access, and public boat access areas, and consulting with stakeholders on recreation management every 10 years after license issuance. However, there is no existing project recreation plan and York Haven Power does not propose a plan for implementing its proposed measures or investigating whether the sites continue to meet demand over the course of the license. As recommended in the EIS, developing a recreation management plan that documents project recreation facilities, operation and maintenance responsibilities, and plans for monitoring recreation demand will provide a guide for the protection, mitigation, and enhancement of the project's recreation facilities. Including a discussion of current and future visitation estimates and a provision for monitoring to be conducted every 12 years, in concert with every other Form 80 reporting period, will ensure the sites meet demand, as well as provide for regular reviews to determine if updates to the plan are necessary. Consultation with the state and federal resource agencies, counties, and other interested stakeholders in the development of the plan and any updates will ensure that stakeholder interests are represented.[54] Article 405 requires the recreation management plan.

C. Shoreline Management

84. York Haven Power does not have an existing SMP; however, it permits non-project uses of project shorelines via the standard land use article and issues permits to individuals for approximately 300 private residential lots on York Haven Power-owned land on the Cly Shore, Beshore, and Shelley islands, located within the

[53] *See* http://www.fws.gov/northeast/ecologicalservices/eaglenationalguide.html.

[54] *See* final EIS at 398.

project boundary.[55] Beshore Island also includes a boat launch, owned and operated by York Haven Power, for the permittees' access. If not properly managed, these uses could impact aesthetics, water quality, and public recreational opportunities at the project.[56]

85. To protect shoreline resources, York Haven Power proposes to continue providing public recreation access, permitting the lots, and conducting routine monitoring to ensure the private structures located on the permitted lots are not in disrepair. York Haven Power does not, however, describe the amount and type of monitoring it will conduct. While the lot permits issued by York Haven Power require permittees to comply with federal, state, and local laws, ultimately it is the responsibility of the licensee to ensure that shoreline development within the project boundary is consistent with project license requirements, purposes, and operation. In the EIS, staff concluded that preparation of an SMP that details the lot permitting process and requirements, as well as York Haven Power's proposed monitoring program, would assist York Haven Power in meeting its responsibilities for protecting the shoreline and ensuring shoreline development activities are consistent with project purposes throughout the term of a license.[57]

86. Development of an SMP that contains a summary of the purpose, goals, and objectives of the plan and a description of the shoreline use classifications will help to ensure that the management of project lands and waters along Lake Frederic's shorelines is consistent with the Commission's shoreline management policies. Updating the SMP every 10 years, if necessary, recognizes the potential for growth and development along the project reservoir over the term of the license.

87. Regarding the permitted lots, the Commission has generally concluded that the long-term leasing of project lands for private residential purposes is at odds with its policy of maximizing public recreation at licensed projects.[58] However, existing residential, commercial, or other structures may be included within the boundary to the extent that underlying lands are needed for project purposes (e.g., for flowage, public

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[55] These permits allow permittees to place trailers or recreational vehicles on the lots; however, many lots include more permanent structures.

[56] Final EIS at 298-99

[57] *Id.* at 398-99.

[58] *See, e.g., Public Utility District No. 2 of Grant County, Washington*, 88 FERC ¶ 61,012, at 61,033 (1999); *Central Maine Power Co.,* 75 FERC ¶ 61,052, at 61,192 (1996).

recreation, shoreline control, or protection of environmental resources),[59] which is the case with the islands on which the permitted lots are located. As such, including within the SMP a detailed description of the permitting program and how the licensee will provide for the termination of permits and removal of lots from the permitting program will ensure that the program is carried out consistent with Commission regulations.

88. Article 406 requires development of an SMP.

D. Project Boundary

89. The project boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources.[60] York Haven Power proposes to add 1.9 acres to the project boundary in order to enclose the entirety of the East Shore Boat Launch and Canal Lock recreation area within the boundary. In the EIS, staff concurred with York Haven Power's proposal because the entire site, including all of the parking lot and historic canal lock, are part of the recreation area.[61] Modifying the project boundary to include all of the lands associated with the East Shore Boat Launch and Canal Lock recreation area would ensure these recreation amenities are provided for the public's enjoyment for the term of the license. This order approves the modified boundary that adds 1.9 acres in order to encompass the entire East Shore Boat Launch and Canal Lock recreation area.

ADMINISTRATIVE PROVISIONS

A. Annual Charges

90. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of funds for administration of the FPA.

B. Exhibit F and G Drawings

91. The Commission requires licensees to file sets of approved project drawings in electronic file format. Article 202 requires the filing of the approved Exhibit F drawings.

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[59] *See* section 4.41(h)(2) of the Commission's regulations, 18 C.F.R. § 4.41(h)(2) (2015).

[60] *See id.*

[61] *See* final EIS at 399.

92. The Exhibit G drawing filed on August 30, 2012, does not provide specific courses and distances for a portion of the boundary, as shown in the "enlargement plan" of the drawing. Article 203 requires the licensee to file a revised Exhibit G drawing that provides specific courses and distances for the entire project boundary.

C. Amortization Reserve

93. The Commission requires that, for new major licenses, non-municipal licensees must set up and maintain an amortization reserve account upon license issuance. Article 204 requires the establishment of the account.

D. Headwater Benefits

94. Some projects directly benefit from headwater improvements that were constructed by other licensees, the United States, or permittees. Article 205 requires the licensee to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

E. Use and Occupancy of Project Lands and Waters

95. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 408 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

F. Review of Final Plans and Specifications

96. Where new construction or modifications to the project are involved, the Commission requires the licensee to file revised exhibits of project features as built. Article 206 provides for the filing of these exhibits.

97. Article 301 requires the licensee to provide the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Office with final construction drawings and specifications, together with a supporting design report, consistent with the Commission's engineering guidelines. The submittal must include a temporary construction emergency action plan, a quality control and inspection program, and a soil erosion and sediment control plan.

98. Article 302 requires the licensee to provide the Commission's D2SI – New York Regional Office with cofferdam and deep excavation construction drawings.

99. Article 303 requires the licensee to coordinate any modifications that would affect project works or operation resulting from environmental requirements with the Commission's D2SI – New York Regional Office.

100. As part of the new license, the licensee is required to construct a nature-like fishway, which may affect the project's existing Public Safety Plan. Article 304 requires the licensee to file a revised Public Safety Plan after construction of the nature-like fishway.

G. Commission Approval of Resource Plans and Filing of Reports and Amendment Applications

101. In Appendices A and B, there are certain conditions and fishway prescriptions that either do not require the licensee to file plans with the Commission for approval, do not require the licensee to file reports with the Commission, or could require future license amendments. Therefore, Article 401 requires the licensee to: (a) file plans with the Commission for approval; (b) file reports with the Commission; and (c) file amendment applications, as appropriate.

STATE AND FEDERAL COMPREHENSIVE PLANS

102. Section 10(a)(2) of the FPA[62] requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.[63] Under section 10(a)(2)(A) of the FPA, federal and state agencies filed 33 comprehensive plans that address various resources in Pennsylvania. Of these, staff identified and reviewed 22 comprehensive plans that are relevant to the York Haven Project.[64] No conflicts were found.

APPLICANT'S PLANS AND CAPABILITIES

103. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA, Commission staff evaluated York Haven Power's record as a licensee for these areas: (A) conservation efforts; (B) compliance history and ability to comply with the new license; (C) safe management, operation, and maintenance of the project; (D) ability to provide efficient and reliable electric service; (E) need for power; (F) transmission services; (G) cost

[62] 16 U.S.C. § 803(a)(2)(A) (2012).

[63] Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2015).

[64] The list of applicable plans is found in section 5.4 of the final EIS.

effectiveness of plans; and (H) actions affecting the public.[65] This order accepts the staff's finding in each of the following areas.

A. Conservation Efforts

104. Section 10(a)(2)(C) of the FPA requires the Commission to consider the electricity consumption improvement programs of the applicant, including its plans, performance, and capabilities for encouraging or assisting its customers to conserve electricity cost-effectively, taking into account the published policies, restrictions, and requirements of state regulatory authorities.[66] The York Haven Project connects with transmission facilities in the PJM Interconnection, a regional transmission organization that coordinates the movement of wholesale electricity throughout Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. Because York Haven Power primarily supplies capacity and energy to the PJM, York Haven Power's ability to influence end-users is limited. Staff concludes that, given the limits of its ability to influence users of the electricity generated by the project, York Haven Power complies with section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with the New License

105. Based on a review of York Haven Power's compliance with the terms and conditions of the existing license, staff finds that York Haven Power's overall record of making timely filings and compliance with its license is satisfactory. Therefore, staff believes that York Haven Power can satisfy the conditions of a new license.

C. Safe Management, Operation, and Maintenance of the Project

106. Staff has reviewed York Haven Power's management, operation, and maintenance of the York Haven Project pursuant to the requirements of 18 C.F.R. Part 12 and the Commission's Engineering Guidelines. Staff concludes that the dams and other project works are safe, and that there is no reason to believe that York Haven Power cannot continue to safely manage, operate, and maintain these facilities under a new license.

D. Ability to Provide Efficient and Reliable Electric Service

107. Staff has reviewed York Haven Power's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric

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[65] 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2012).

[66] 16 U.S.C. § 803(a)(2)(C) (2012).

service. Staff's review indicates that York Haven Power regularly inspects the project turbine generator units to ensure that they continue to perform in an optimal manner, schedules maintenance to minimize effects on energy production, and since the project has been in operation, has undertaken initiatives to ensure that the project is able to operate reliably into the future. Staff concludes that York Haven Power is capable of operating the project to provide efficient and reliable electric service in the future.

E. Need for Power

108. The York Haven Project serves the PJM regional transmission grid by providing 19.62 MW of capacity for local and regional power demand. To assess the need for power, staff looked at the need for power in the operating region in which the project is located, which is the PJM region of the North American Electric Reliability Corporation (NERC). NERC annually forecasts electrical supply and demand in the nation and the region for a 10-year period. NERC's most recent report on annual supply and demand projections for the PJM region indicates that total summer demand is projected to grow at an annual average compound rate of 1.25 percent over the 10-year planning period from 2014 through 2023. Independent power producers such as York Haven Power are projected to supply part of this demand. Staff concludes that the project's power and contribution to the region's diversified generation mix will help meet a need for power in the region.

F. Transmission Services

109. There are no primary transmission lines included as part of the York Haven Project, because it interconnects with the 115-kV electric grid at a substation immediately downstream of the project's downstream forebay wall. York Haven Power is proposing no changes that would affect its own or other transmission services in the region.

G. Cost Effectiveness of Plans

110. York Haven Power plans to make a number of facility and operational modifications to enhance environmental resources affected by the project. Based on York Haven Power's record as an existing licensee, staff concludes that these plans are likely to be carried out in a cost-effective manner.

H. Actions Affecting the Public

111. York Haven Power provided extensive opportunity for public involvement in the development of its application for a new license for the York Haven Project. During the previous license period, York Haven Power maintained recreational facilities, boat launches, fishing access, and parking areas, which enhanced public use of project lands. York Haven Power uses the project to help meet regional power needs. In addition, the project provides employment opportunities.

PROJECT ECONOMICS

112. In determining whether to issue a new license for an existing hydroelectric project, the Commission considers a number of public interest factors, including the economic benefits of project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corporation*,[67] the Commission uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

113. In applying this analysis to the York Haven Project, Commission staff considered three options: the no-action alternative, York Haven Power's proposal, and the project as licensed herein. Under the no-action alternative, the project would continue to operate as it does now. The project has an installed capacity of 19.62 MW and generates an average of 132,271 megawatt-hours (MWh) of electricity annually. Multiplying staff's estimate of average generation by the alternative power cost of $58.96/MWh yields a total value of the project's power of $7,798,698 in 2014 dollars.[68] The average annual project cost is about $6,456,290 or $48.81/MWh. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the project's power.[69] Therefore, the project costs $1,342,408, or $10.15/MWh, less to produce power than the likely alternative cost of power.

114. As proposed by York Haven Power, the levelized annual cost of operating the project is $7,062,310, or $53.60/MWh. The project would generate an estimated average 131,771 MWh of energy annually. When the estimate of average generation is multiplied by the alternative power cost of $58.98/MWh, the result is a total value of the project's

[67] 72 FERC ¶ 61,027 (1995).

[68] The alternative power cost is based on an average daily energy rate of $52.83/MWh and a capacity rate of $46.14/kilowatt-year. The average daily energy rate is based on an average on-peak energy rate of $63.33/MWh and an average off-peak energy rate of $42.33/MWh. All rates are based on the 2014 PJM State of the Market values.

[69] Details of staff's economic analysis for the project as licensed herein and for various alternatives are included in the final EIS issued March 11, 2015. All costs here have been escalated by staff to December 2014 dollars.

power of $7,771,854 in 2014 dollars. Therefore, in the first year of operation, the project would cost $709,544, or $5.38/MWh, less than the likely alternative cost of power.

115. As licensed herein with the mandatory conditions and staff measures, the levelized annual cost of operating the project is about $7,074,620, or $53.69/MWh. The project would generate an estimated average 131,771 MWh of energy annually. When the estimate of average generation is multiplied by the alternative power cost of $58.98/MWh, the result is a total value of the project's power of $7,771,854 in 2014 dollars. Therefore, in the first year of operation, project power will cost $697,234, or $5.29/MWh, less than the likely cost of alternative power.

116. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include the ability to help maintain the stability of a power system by quickly adjusting power output to respond to rapid changes in system load, and to respond rapidly to a major utility system or regional blackout by providing a source of power to help restart fossil-fuel based generating stations and put them back on line.

COMPREHENSIVE DEVELOPMENT

117. Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality.[70] Any license issued must be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

118. The EIS for the project contains background information, analysis of effects, and support for related license articles. The project will be safe if operated and maintained in accordance with the requirements of this license.

119. Based on Commission staff's independent review and evaluation of the York Haven Project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the EIS, the proposed York Haven Project, with the mandatory conditions and staff-recommended modifications and measures, is best adapted to a comprehensive plan for improving or developing the Susquehanna River.

[70] 16 U.S.C. §§ 797(e) and 803(a)(1) (2012).

120. This alternative was selected because: (1) issuance of a new license will serve to maintain a beneficial, dependable, and inexpensive source of electric energy; (2) the required environmental measures will protect and enhance fish and wildlife resources, water quality, recreational resources, and historic resources; and (3) the 19.62 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution.

LICENSE TERM

121. Section 15(e) of the FPA provides that any new license issued shall be for a term that the Commission determines to be in the public interest, but not less than 30 years or more than 50 years.[71] The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such activities; and 50-year terms for projects with extensive measures.[72]

122. This license authorizes a moderate amount of new construction and environmental mitigation and enhancement measures. Consequently, a 40-year license term for the York Haven Project is appropriate.

123. When establishing a license term, it also is Commission policy to "coordinate the expiration dates of licenses [in the same river basin] to the maximum extent possible, to maximize future consideration of cumulative impacts at the same time in contemporaneous proceedings at relicensing."[73] To this end, the new license for the Muddy Run Project No. 2355, which is being issued concurrently with this license order, is also for a term of 40 years.

124. As noted above, there are three other nearby licensed projects located on the lower Susquehanna River: Conowingo Project No. 405, Safe Harbor Project No. 1025, and Holtwood Project No. 1881. The Conowingo Project license has expired and its application for a new license is currently pending before the Commission (awaiting State of Maryland action on the project's application for water quality certification).

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[71] 16 U.S.C. § 808(e) (2012).

[72] *See Consumers Power Co.*, 68 FERC ¶ 61,077, at 61,383-84 (1994).

[73] 18 C.F.R. § 2.23 (2015).

125. The Safe Harbor Project license will expire on April 22, 2030,[74] and the Holtwood Project license will expire on August 31, 2030.[75] Under the FPA, the Commission cannot issue a new license with a term of less than 30 years; therefore, the term of this license cannot be coordinated with those for the Safe Harbor Project and the Holtwood Project, because they expire 15 years from now in 2030.

The Director orders:

(A) This license is issued to York Haven Power Company, LLC (licensee), for a period of 40 years, effective the first day of the month in which this order is issued, to operate and maintain the York Haven Project. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in these lands, described in the project description and the project boundary discussion of this order.

(2) Project works consisting of: (a) a 928-foot-long, concrete gravity overflow, east channel dam with an average height of 9 feet that spans the river channel from Three Mile Island to the east shoreline; (b) a 4,970-foot-long, concrete covered rock fill and rock-fill/timber crib, main dam spanning the river from Three Mile Island to a headrace wall and with a maximum height of 18 feet and an average height of 10 feet; (c) a 3,000-foot-long headrace wall forming a headrace channel; (d) a 472-foot-long by 48-foot-wide, brick and stone masonry powerhouse located at the end of the headrace and containing 6 propeller and 14 Francis turbine-generator units with nameplate ratings ranging from 0.7 to 1.6 megawatts (MW), having a total installed capacity of 19.62 MW; (e) a 475-foot-long west forebay dam and retaining wall, and a 115-foot-long south forebay dam, which together connect the powerhouse with the west shoreline; (g) an impoundment, Lake Frederic, with a surface area of 2,218 acres at a normal water surface elevation of 277.86 feet;[76] (h) a vertical slot upstream fishway located at the east channel dam; (i) two wheel gates, each with a 1,000-cfs capacity, used to pass attraction flow for

[74] *Safe Harbor Water Power Corp.*, 18 FERC ¶ 62,535, at 63,916 (1982). (Although the order was issued in 1980, the order itself was not published in the FERC reports until 1982.)

[75] *PPL Holtwood, LLC*, 129 FERC ¶ 62,092, at 64,267 (2009).

[76] All elevations are referenced to the National Geodetic Vertical Datum of 1929.

the east channel fishway; (j) a "nature-like" fishway, located at the junction of the main dam and the west shore of Three Mile Island, reaching upstream from the York Haven Dam, with a varying width of approximately 300 feet, a thalweg channel width of approximately 65 feet, and a supplemental attraction flow channel on the Three Mile Island side of the nature-like fishway facility; and (k) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F shown below:

Exhibit A: The following sections of Exhibit A filed on August 30, 2012:

Section 1, pages A-1 through A-2 entitled "General Project Description" and section 2, pages A-2 through A-8 entitled "Project Facilities," describing the mechanical, electrical, and transmission equipment within the application for license.

Exhibit F: The following Exhibit F drawings filed on August 30, 2012:

Exhibit F Drawing	FERC No. 1888-	Description
Sheet F-1	1001	Dams and Headrace Wall
Sheet F-2	1002	Power House Plan and Elevation
Sheet F-3	1003	Power House Sections and Transformer House Details
Sheet F-4	1004	Power House Sections
Sheet F-5	1005	General Arrangement and Final Elevations
Sheet F-6	1006	Structural Arrangement Permanent Cofferdam Layout Plan
Sheet F-7	1007	Structural Details Permanent Cofferdam and Rock Anchors Sections and Details
Sheet F-8	1008	Structural Arrangement Fish Passage Weir Plan and Conc. Sections and details
Sheet F-9	1009	Structural Details Fish Passage Weir and Weir Sill Structural Details
Sheet F-10	1010	General Arrangement Fish Passage Fish Ladder Layout
Sheet F-11	1011	Structural Arrangement Fish Passage Counting Building and Crowder Plan, Sections and Details
Sheet F-12	1012	Structural Details Fish Passage Energy Diffusers In Attraction Water Channel
Sheet F-13	1013	General Arrangement Fish Passage Fish Ladder Profile with Water Elevations
Sheet F-14	1014	Civil Arrangement Fish Passage Project Finished Grading Plan

Sheet F-15	1015	Civil Arrangement Fish Ladder Area Finished Grading Plan
Sheet F-16	1016	Civil Arrangement Fish Passage Civil Details and Notes

(3) All of the structures, fixtures, equipment, or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(4) Project recreation facilities including: (1) the East Shore Boat Launch and Canal Lock recreation area; (2) Goosehorn Island Picnic Area; (3) Shelley Island Recreation Area; (4) Goodling Island Picnic Area; (5) Battery Island Picnic Area; (6) York Haven Power Plant Recreation Area; and (7) a canoe portage trail. These facilities are owned and operated by York Haven Power.

(C) The Exhibits A and F described above are approved and made part of this license. The Exhibit G drawing filed as part of the application for license does not provide specific courses and distances for a portion of the project boundary and is not approved.

(D) This license is subject to the conditions submitted by the Pennsylvania Department of Environmental Protection under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1)(2012), as those conditions are set forth in Appendix A to this order.

(E) This license is subject to the conditions submitted by the Secretary of the U.S. Department of the Interior under section 18 of the FPA, as those conditions are set forth in Appendix B to this order.

(F) This license is also subject to the articles set forth in Form L-3(Oct. 1975), entitled, "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States" (*see* 54 F.P.C. 1792 *et seq.*), as reproduced at the end of this order, and the following additional articles:

Article 201. *Administrative Annual Charges*. The licensee must pay the United States annual charges, effective the first day of the month in which the license is issued, and as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 19.62 megawatts.

Article 202. *Exhibit F Drawings*. Within 45 days of the date of issuance of this license, as directed below, the licensee must file two sets of the approved exhibit

drawings in electronic file format on compact disks with the Secretary of the Commission, ATTN: OEP/DHAC.

Digital images of the approved exhibit drawings must be prepared in electronic format. Prior to preparing each digital image, the FERC Project-Drawing Number (i.e., P-1888-1001 through P-1888-1016) must be shown in the margin below the title block of the approved drawing. Exhibit F drawings must be segregated from other project exhibits, and identified as Critical Energy Infrastructure Information (CEII) material under 18 C.F.R. § 388.113(c). Each drawing must be a separate electronic file, and the file name must include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-1888-1001, F-1, Dams and Headrace Wall, MM-DD-YYYY.TIF].

All digital images of the exhibit drawings must meet the following format specification:

IMAGERY – black & white raster file
FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4 (also known as T.6 coding scheme)
RESOLUTION – 300 dots per inch (dpi) desired, (200 dpi minimum)
DRAWING SIZE FORMAT – 22" x 34" (minimum), 24" x 36" (maximum)
FILE SIZE – less than 1 megabyte desired.

Article 203. *Exhibit G Drawing*. Within 90 days of the date of issuance of this license, the licensee must file, for Commission approval, a revised Exhibit G drawing that complies with sections 4.39 and 4.41 of the Commission's regulations and includes specific courses and distances for the entire project boundary.

Article 204. *Amortization Reserve*. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project must be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee must set aside in a project amortization reserve account at the end of each fiscal year one-half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee must deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee must set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee must maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves must be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and

proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios must be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity must be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 205. *Headwater Benefits*. If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee must reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Article 206. *As-built Exhibits*. Within 90 days of completion of construction of the facilities authorized by this license, the licensee must file, for Commission approval, revised exhibits A, F, and G, as applicable, to describe and show those project facilities as built. In addition, a courtesy copy must be filed with the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer.

Article 301. *Contract Plans and Specifications*. At least 60 days prior to the start of any construction, the licensee must submit one copy of its plans and specifications and supporting design document to the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer, and two copies to the Commission (one of these must be a courtesy copy to the Director, D2SI). The submittal to the D2SI-New York Regional Engineer must also include as part of preconstruction requirements: a Quality Control and Inspection Program, Temporary Construction Emergency Action Plan, and Soil Erosion and Sediment Control Plan. The licensee may not begin construction until the D2SI-New York Regional Engineer has reviewed and commented on the plans and specifications, determined that all preconstruction requirements have been satisfied, and authorized start of construction.

Article 302. *Cofferdam Construction Drawings and Deep Excavations*. Should construction require cofferdams or deep excavations, the licensee must: (1) review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction; and (2) must ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of any cofferdams or deep excavations, the licensee must submit one copy to the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer and two copies to the Commission (one of these copies must be a courtesy copy

to the Director, D2SI), of the approved cofferdam and deep excavation construction drawings and specifications, and the letters of approval.

Article 303. *Project Modification Resulting From Environmental Requirements*. If environmental requirements under this license require modification that may affect the project works or operations, the licensee must consult with the Commission's Division of Dam Safety and Inspections-New York Regional Engineer. Consultation must allow sufficient review time for the Commission to ensure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Article 304. *Public Safety Plan*. At least 60 days after completion of construction of the nature-like fishway required by Pennsylvania Department of Environment's water quality certification (Appendix A), the licensee must submit one copy to the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer and two copies to the Commission (one of these copies must be a courtesy copy to the Commission's Director, D2SI) of an updated Public Safety Plan. The plan must include an updated evaluation of public safety concerns at the project site, including all updated designated recreation areas, and assess the need for the installation of safety devices or other safety measures. The submitted plan must include a description of all public safety devices and signage, as well as a map showing the location of all public safety measures. For guidance on preparing public safety plans the licensee can review the *Guidelines for Public Safety at Hydropower Projects* on the FERC website.

Article 401. *Commission Approval, Reporting and Filing of Amendments*.

(a) Requirement to File Plans for Commission Approval

Various conditions of this license found in the Pennsylvania Department of Environmental Protection (Pennsylvania DEP) final section 401 Water Quality Certification (certification) conditions (Appendix A), and the U.S. Department of the Interior (Interior) fishway prescription (Appendix B) require the licensee to prepare plans in consultation with other entities for approval by Pennsylvania DEP or Interior (U.S. Fish and Wildlife Service [FWS]) for submittal to the Commission and implement specific measures without prior Commission approval. Each such plan must also be submitted to the Commission for approval. These plans are listed below.

Certification Condition No.[a]	**Interior Condition No.[a]**	**Description**	**Due Date**
III.A.1.a	9.8	Fishway operating procedures	No set date for initial fishway operating procedures. Proposed modifications due 60 days prior to operation of nature-like fishway (NLF) or any other enhancements and/or facilities.
III.A.2.b.i	9.9.1.b	Final plans and specifications for NLF[b]	January 31, 2016

Certification Condition No.[a]	Interior Condition No.[a]	Description	Due Date
III.B.1.b.iv	9.9.3.b.iv	NLF monitoring plan	10 months prior to start of second upstream American shad passage season following completion of NLF (estimated due date: June 1, 2023, assuming NLF completion in fall 2021)
III.B.3.d	9.9.6.d	Juvenile American shad headrace turbine avoidance study plan	Within 4 years of license issuance
III.B.3.e	9.9.6.e	Designs for removal of barriers to downstream migration	Within 4 years of license issuance
III.C.2.c	9.9.7.c	Site-specific downstream eel study plan, including route of passage and eel survival	November 30, 2020)

[a] The conditions shown in this table were filed by Pennsylvania DEP on August 19, 2014, and by Interior on February 7, 2014.

[b] The filing must include the final results of the pre-construction environmental studies for the following: (a) vegetation cover-type mapping, (b) wetlands delineations, (c) invasive species surveys, (d) rare species surveys, (e) a bog turtle habitat assessment, and (f) a bald eagle survey. The filing must also include all comments from state and federal agencies and other stakeholders on the completed studies, and any protection measures proposed by resource agencies as a result of the studies.

The licensee must include with each plan filed with the Commission documentation that the licensee has received approval from Pennsylvania DEP or Interior, as appropriate.

The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan or changes in project operations or facilities, including any changes required by the Commission.

(b) Requirement to File Reports

Certain conditions of the Pennsylvania DEP certification and Interior fishway prescription require the licensee to file reports with other entities. Because these reports relate to compliance with the requirements of this license, each such report must also be submitted to the Commission. These reports are listed in the following table:

Certification Condition No.[a]	Interior Condition No.[a]	Description	Due Date
III.A.1.d	9.8.d	Fish passage operating procedures annual report	By December 31 of each year
Appendix C section 7		Nature-like fishway annual monitoring report	Within six months of completion of each year's monitoring
Appendix F section 6		Headrace juvenile shad turbine avoidance study report	Within 90 days of completion of the study
Appendix G section 6		Downstream eel site-specific route of passage study	Within 90 days of completion of the study

[a] The conditions shown in this table were filed by Pennsylvania DEP on August 19, 2014, and by Interior on February 7, 2014.

The licensee must submit to the Commission documentation of any consultation, and copies of any comments and recommendations made by any consulted entity in connection with each report. The Commission reserves the right to require changes to project operations or facilities based on information contained in the report and any other available information.

(c) Requirement to File Amendment Applications

Certain conditions of Pennsylvania DEP's certification (Appendix A) and Interior's fishway prescription (Appendix B) contemplate unspecified long-term changes to project operations or facilities based on the results of studies or monitoring. Such changes may not be implemented without prior Commission authorization granted after the filing of an application to amend the license.

Article 402. *Reservation of Authority to Prescribe Fishways*. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 403. *Bald Eagle Protection.* At least 60 days prior to construction of the nature-like fishway or maintenance activities that may affect the bald eagle or its habitat (such as non-routine noise, human activity, or tree removal that would disturb an active nest), the licensee must ensure the activity is consistent with U.S. Fish and Wildlife Service's (FWS') National Bald Eagle Management Guidelines (May 2007, or most recent version of the document, available at *http://www.fws.gov/northeast/ecologicalservices/eaglenationalguide.html*). If the activity is inconsistent, the licensee must consult with the FWS' Pennsylvania Field Office and the Pennsylvania Game Commission to develop measures to protect the bald eagle or its habitat. If the licensee and the resource agencies are unable to reach agreement on measures, the licensee must file, for Commission approval, a plan describing the licensee's activity, a description of the inconsistency between its activity and the National Bald Eagle Management Guidelines, alternative measures to protect the bald eagle or its habitat, and the licensee's record of consultation with the resource agencies.

The Commission reserves the right to require changes to such a plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 404. *Timing of tree clearing during construction.* To minimize impacts to the federally threatened northern long-eared bat, the licensee must limit tree clearing associated with construction of the nature-like fishway to between November 15 and March 31, in the years when construction occurs.

Article 405. *Recreation Management Plan*. Within 6 months of license issuance, the licensee must develop a plan, for Commission approval, to provide for the operation and maintenance of project recreation facilities at the York Haven Hydroelectric Project. The plan, at a minimum, must include:

(1) A description of the purpose, goals, and objectives of the plan;

(2) A description of the existing recreation facilities at the following project recreation sites: (a) York Haven Power Plant Recreation Area; (b) Battery Island Picnic Area; (c) Goodling Island Picnic Area; (d) Shelley Island Recreation Area; (e) Goosehorn Island Picnic Area; (f) East Shore Boat Launch and Historic Launch; and (g) canoe portage trail;

(3) Provisions for operating and maintaining the project recreation sites identified in item (2);

(4) A plan and schedule to file as-built site plan drawings of the existing recreation sites at the project once the recreation management plan has been filed with the Commission, for approval; and

(5) A provision for monitoring use of project recreation sites every 12 years, starting in 2026 and continuing throughout the license term (consistent with every other 6-year Form 80 reporting period deadline), to ensure the sites meet demand and are operating as intended.

In addition, the recreation management plan must include a recreation facilities table that describes all approved recreation facilities for each project recreation site and a recreation amenities table that describes the amenities identified in the recreation facilities table and provides geographic information system (GIS) location data for each recreation amenity. The recreation facilities and recreation amenities tables must be developed in accordance with the guidelines provided in the Project Recreation Facilities Tables and As-Built Site Plan Drawing Guidance.[77]

The recreation management plan and any updates must be developed in consultation with resource agencies; York, Dauphin, and Lancaster Counties, Pennsylvania; and other interested stakeholders, including the Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Department of Conservation and Natural Resources, the Susquehanna River Basin Commission, and the National Park Service. The licensee must include with the plan and any updates an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must provide a minimum of 30 days for the entities to comment and to make recommendations before filing the plan or any updates with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

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[77] Available on the Commission's internet site at: http://www.ferc.gov/industries/hydropower/gen-info/guidelines/as-built-site-plan.pdf.

The Commission reserves the right to require changes to the plan or any updates. Implementation of the plan or any updates must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan or the updates, including any changes required by the Commission.

The licensee must file a report, filed every 12 years on October 1, six months after the due date of every other Form 80 reporting period, describing whether or not an update to the recreation plan is needed. The report must include an evaluation of the adequacy of existing recreation facilities to provide public access and whether or not changes are warranted to address existing and projected future recreation needs. If an update to the approved recreation management plan is needed, the licensee must either provide a plan and schedule for filing an update or incorporate the update into the report (documents with the proposed changes tracked are preferred so that plan modifications can be easily identified). If the licensee proposes changes to the existing facilities, the licensee must file the changes with the Commission for approval.

Article 406. *Shoreline Management Plan*. Within one year of license issuance, the licensee must develop a plan, for Commission approval, to manage project shorelines for the protection of scenic, recreational, and environmental resources at the York Haven Hydroelectric Project. The plan, at a minimum, must include:

(1) A description of the purposes, goals, and objectives of the plan;

(2) A description of proposed shoreline use classifications, with identified allowable and prohibited uses, for existing and future use of the shoreline;

(3) Details on the licensee's permitting program and guidelines, including how the licensee will manage the permitting program for the approximately 300 permitted lots located on licensee-owned land within the project boundary on Cly Shore, Beshore, and Shelley Islands, and what those permits allow and prohibit;

(4) Details on how the licensee will provide for the termination of permits and removal of existing permitted lots from the permitting program when: (a) lots are abandoned by the lot permittee, or (b) existing structures become damaged and are not promptly repaired in accordance with all applicable federal, state, and local regulations;

(5) Details on the licensee's shoreline monitoring and enforcement program; and

(6) A provision for a report to be filed every 10 years, describing whether or not an update to the shoreline management plan is needed. The report must include an evaluation of the adequacy of the plan and whether or not changes are warranted. If an update is needed, the licensee may choose to either provide a plan and schedule for filing an update or incorporate the update into the report (red-line documents are preferred so that plan modifications can be easily identified).

Nothing in this article requires the licensee to grant or renew permits for any residential lot.

The plan and any updates must be developed in consultation with resource agencies; York, Dauphin, and Lancaster Counties, Pennsylvania; and other interested stakeholders, including Pennsylvania Fish and Boat Commission, Pennsylvania Department of Conservation and Natural Resources, and the Pennsylvania Department of Environmental Protection. The licensee must include with the plan and any updates an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must provide a minimum of 30 days for the entities to comment and to make recommendations before filing the plan or the updates with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan or any updates. Implementation of the plan or any updates must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan or the updates, including any changes required by the Commission.

Article 407. *Programmatic Agreement and Historic Properties Management Plan*. The licensee must implement the "Programmatic Agreement Between the Federal Energy Regulatory Commission and the Pennsylvania Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuing a New License to York Haven Power Company, LLC, for the Continued Operation of the York Haven Project in York, Dauphin, and Lancaster Counties, Pennsylvania (FERC No. 1888-030)," executed on April 21, 2015, and including but not limited to the Historic Properties Management Plan (HPMP) for the project. Pursuant to the requirement of this Programmatic Agreement, the licensee must file, for Commission approval, a final HPMP within 6 months of issuance of this order. The final HPMP should be based on the draft HPMP filed with the Commission on December 28, 2012.

The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated prior to Commission approval of the HPMP, the licensee must obtain approval from the Commission and the Pennsylvania State Historic Preservation Officer, before engaging in any ground-disturbing activities or taking any other action that may affect any historic properties within the project's area of potential effects.

Article 408. *Use and Occupancy*. (a) In accordance with the provisions of this article, the licensee must have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval.

The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee must also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project

overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on

recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must not apply to any part of the public lands and reservations of the United States included within the project boundary.

(G) The licensee must serve copies of any Commission filing required by this order on any entity specified in the order to be consulted on matters relating to that filing. Proof of service on these entities must accompany the filing with the Commission.

(H) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 825*l* (2012), and section 385.713 of the Commission's regulations, 18 C.F.R. § 385.713 (2015). The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Ann F. Miles
Director
Office of Energy Projects

Form L-3
(October, 1975)

**FEDERAL ENERGY REGULATORY COMMISSION
TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED
MAJOR PROJECT AFFECTING NAVIGABLE
WATERS OF THE UNITED STATES**

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the

Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a nonpower licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project

property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such

conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that

the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during

the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to the United States, free of cost, such of its lands and rights-of-way and such rights of

passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

Article 25. The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 27. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 28. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

APPENDIX A

Water Quality Certificate Conditions for the York Haven Project Issued by the Pennsylvania Department of Environmental Protection on August 19, 2014[78]

II. PROVISIONS APPLICABLE TO ALL WATER QUALITY CERTIFICATION CONDITIONS

A. Final Agency Action. Any action taken by the Pennsylvania Department of Environmental Protection ("DEP" or "PADEP") in response to any submission required or authorized under this certification or any action taken by DEP to require YORK HAVEN to undertake any action that affects YORK HAVEN's personal or property rights, privileges, immunities, duties, liabilities or obligations including, but not limited to, any action to approve, approve with conditions, disapprove, modify or establish operational or structural changes, plans, schedules, studies or monitoring programs shall constitute a "final agency action" and may be challenged in accordance with applicable law.

B. Operational modifications are a component of the adaptive management system to implement the approved plans, including the performance requirements of this certification. Operational modifications include modifications of seasonal and daily periods of operation of the fishways, dam and powerhouse, detailing how the plant shall be operated during fish passage season and throughout the year. These operational modifications may include:

- sequencing of turbine start-up and operation;
- procedures for estimating, monitoring and reporting flow management through the power house, in the tailrace, above, through and downstream of the nature-like fishway, and through the East Channel fishway as described in the Fishway Operating Procedures ("FOP");
- any other necessary provisions to implement elements of this certification for plant operation, to ensure attraction to and operation of the fishways or to meet other provisions of this certification and its procedures for monitoring and reporting on the operation of each fish passage facility or other provisions of this certification or measure;

[78] Pennsylvania DEP water quality certification conditions III.B.3[a][i] and III.B.3[b][i] are modified by deleting references to an incorrect number of generating units and inserting the correct references.

- procedures for annual fish passage facilities start-up and shut-down; and,
- procedures for use in case of emergencies and project outages significantly affecting fishway operations or other provisions of this certification.

C. Structural modifications are changes to project infrastructure, tailrace, fishways or other areas of the Susquehanna River pursuant to the provisions of this certification. No substantial alteration or addition not in conformity with the plans approved by the Federal Energy Regulatory Commission shall be made to any dam or other project works, constructed under the Federal Power Act without the prior approval or authorization of the Federal Energy Regulatory Commission.

D. Resources Agencies – Pennsylvania Department of Environmental Protection ("DEP" or "Department"), Pennsylvania Fish and Boat Commission ("PFBC"), Susquehanna River Basin Commission ("SRBC"), Maryland Department of Natural Resources ("MDDNR"), and the United States Fish and Wildlife USFWS ("USFWS").

E. General Requirements

1. The work authorized under this certification shall, at all times, be subject to oversight and inspection by representatives of DEP, and no changes in the maps, plans, profiles, and specifications as approved shall be made except with the written consent of DEP. DEP, however, reserves the right to require such changes or modifications in the maps, plans, profiles, and specifications as may be considered necessary to assure compliance with the Pennsylvania Clean Streams Law, Dam Safety and Encroachments Act and other appropriate requirements of state law. DEP further reserves the right to suspend or revoke this certification for failure to comply with appropriate requirements of state law, an administrative order of DEP or a term or condition of this certification.

2. YORK HAVEN shall notify DEP, in writing, of the proposed time for commencement of earth disturbance activity, under this certification at least 15 days prior to the commencement of the work.

3. YORK HAVEN shall prepare, implement and monitor the Erosion and Sedimentation Control Plan prepared in accordance with Chapter 102 so as to minimize erosion and prevent excessive sedimentation into the receiving watercourse or body of water.

4. All wetlands within the project area shall be accurately delineated and marked in the field prior to the start of construction activities and such field marking shall be maintained up to the time that earth disturbance activities are completed and the site has been stabilized. An acceptable means of field-identification is the use of an orange construction safety fence.

5. YORK HAVEN shall obtain either coverage under a general NPDES Permit or an individual NPDES Permit for Stormwater Discharges Associated with

Construction Activity for earth disturbance activities requiring an NPDES permit, prior to conducting such earth disturbance activities.

6. Any additional information or revisions to any submittal required under this certification requested by the DEP in writing or any changes to implementation of any plans requested in writing by the DEP shall be submitted or completed within 15 business days of the request or such longer period of time approved by the DEP in writing.

F. Temporary stream crossings

1. All necessary causeway and/or cofferdams shall be constructed of rock, clean granular fill materials, or other materials meeting specifications approved by DEP reasonably free of fines, silts and other erodible material.

2. All temporary cofferdams shall be completely removed and the area restored and stabilized upon completion of the project in accordance with 25 Pa. Code Chapter 102 and the approved Erosion and Sedimentation Control Plan.

3. Roads shall cross all watercourses at a right angle to the stream, unless an alternative configuration is otherwise approved in writing by DEP.

4. A culvert, having as large a diameter as possible, must be provided to minimize placement of excessive fill and excavation of the streambanks. If the bank height prohibits a large diameter pipe culvert, the crossing could consist of a bridge. The minimum size diameter culvert to be used is 12 inches.

5. Road and causeway embankments shall consist of rock, clean granular fill materials, or other materials meeting specifications approved by DEP, reasonably free of fines and silt or other erodible material, to minimize stream channel sedimentation during placement, removal, and periods of overtopping. No construction materials or equipment shall be stockpiled or stored overnight on crossings or causeways.

6. Unless otherwise approved by DEP, approach roads to temporary road crossings shall utilize original grades. However, clean rock material or gravel to a depth of six inches above original grade shall be utilized for approaches as necessary.

7. Temporary road crossings shall be kept open and functioning at all times by maintaining the crossings free of debris and other obstructions.

8. Construction of the temporary roads and cofferdams at any public boat launching ramp along a waterway shall take place between September 15 and May 15.

G. Reasonable Assurance of Compliance – DEP supports issuance of a 46 year license by FERC for the project. Because of changes in the characteristics of the Susquehanna River that will occur by 2030 and because the FERC licenses for the Holtwood Hydroelectric Facility and the Safe Harbor Hydroelectric Facility expire in

2030, this certification may be revised in 2030, as necessary, to establish requirements consistent with Section 401 of the Clean Water Act, 33 U.S.C Section 1341.

III. FISH PASSAGE

A. General Requirements

1. Fishway Operating Procedures ("FOP")

a. YORK HAVEN shall establish and maintain a FOP for the operation and maintenance of facilities related to migratory and resident fish passage, which shall be subject to review and approval by DEP and review and comment by the other Resource Agencies. The FOP will include, for each fishway, schedules for routine maintenance, procedures for routine operations (including: seasonal and daily periods of operation, dam and powerhouse operational measures) detailing with how the plant shall be operated during fish passage season including sequencing of turbine start-up and operation, debris management as well as any other necessary provisions for plant operation and related to attraction flow as a component of the fish passage system including the NLF provisions for the operation of the NLF, procedures for monitoring and reporting on the operation, and procedures for use in case of emergencies and Project outages significantly affecting fishway operations.

b. YORK HAVEN shall implement the FOP consistent with the approval by the DEP. YORK HAVEN shall provide written documentation to the Resource Agencies that all fishway operational personnel have received training concerning the content of the approved FOP, which documentation shall be signed by the Project's operations manager.

c. Copies of the approved FOP and all modifications will be provided to the Resource Agencies.

d. By December 31 of each year, YORK HAVEN shall provide to the Resource Agencies an annual report detailing: (1) the implementation of the FOP, including any deviations from the FOP and a process to prevent or minimize those deviations in the future, or in the case of emergencies or Project outages, the steps taken by YORK HAVEN to minimize or mitigate adverse effects on fishway operation or fish passage measures; and (2) any proposed modifications to the FOP to further enhance its effectiveness in the future. YORK HAVEN shall meet with the Resource Agencies by January 31 of each year

unless a different date is mutually agreed upon by YORK HAVEN and the Resource Agencies. Any required modifications to the FOP requested by DEP or the USFWS shall be submitted to the Resource Agencies within 30 days of receipt of such request for the modification unless a longer period is approved by DEP. The modifications to the FOP shall be implemented consistent with the approval of the DEP.

e. Except as otherwise specifically provided, for fish passage system enhancements and facilities that do not begin operation with the entry into operation of the Project under the new FERC license, 60 days prior to operation of the enhancements and/or facilities, YORK HAVEN shall submit FOP provisions for any such new fish passage enhancements, facilities and measures to the Resource Agencies for review and approval by DEP and review and comment by the other Resource Agencies, and YORK HAVEN shall implement the FOP as approved by the DEP.

f. The FOP shall also include the procedures for resident fish passage.

2. Nature-Like Fishway Construction – YORK HAVEN will finance, design, permit and install a nature-like fishway facility ("NLF Facility") in the vicinity of the apex of the Main dam and Three Mile Island ("TMI") in accordance with the conditions set forth below.

a. Unless a different plan is approved by the DEP in writing, the NLF Facility shall be in substantial compliance with the design concept and criteria for the NLF Facility set forth in Appendix A and B hereto.

b. The NLF Facility shall be authorized, constructed and operated consistent with the following schedule unless the DEP approves a different schedule in writing. YORK HAVEN shall respond to all Resource Agency and FERC requests for additional information within 60 days from receipt of the request unless a different response time is approved by the DEP in writing.

i. By March 31, 2015, YHPC shall prepare and submit to the Resource Agencies a functional design of the NLF Facility, including hydrologic and hydraulic analyses, NLF configuration and dimensions, general arrangements drawings with plan and profile views,

and draft elements of applications for an ACOE Clean Water Act §404 Permit, a §401 Water Quality Certification, an Erosion and Sedimentation Control Plan and an NPDES Permit for Stormwater Discharge Associated with Construction Activities.

ii. By July 15, 2015, YORK HAVEN shall prepare and submit (a) a complete application to the ACOE for a Clean Water Act §404 Permit; (b) an application to DEP for a §401 Water Quality Certification; (c) an Erosion and Sedimentation Control Plan and application to DEP for an NPDES Permit for Stormwater Discharge Associated with Construction Activities; and (d) engineering designs and a request for construction approval from FERC.

iii. The process of issuing bid requests, evaluating bids, finalizing costs and completing procurement of construction contracts for the NLF Facility shall be completed within 150 days from issuance of all necessary governmental approvals for NLF Facility construction, including the Clean Water Act §404 permit, the related DEP water quality certification, the NPDES Permit for Stormwater Associated with Construction Activities, and the FERC approval for the NLF Facility.

iv. The NLF Facility shall be constructed and placed into operation within 3 full construction seasons after the date specified in ¶ iii above.

vi. Except as otherwise provided herein, other than facility and operations modifications to the NLF as provided in Sections III.B.1.d and e, YORK HAVEN shall not be required to design, construct or install any additional fish passage structure at the project prior to 2041.

c. YORK HAVEN shall implement the NLF operation and maintenance plan consistent with the approval of the DEP as part of the FOP.

B. American Shad Passage

1. Upstream Shad Passage

a. The period from completion of construction through the end of the first American shad upstream shad passage season following completion of the NLF Facility will be a "shake-down" period, during which YORK HAVEN shall conduct visual observations and make adjustments to the NLF Facility to address any unanticipated inhibitions or barriers that impede the NLF Facility's performance.

b. Starting in the second American shad upstream passage season following completion of the NLF Facility, YORK HAVEN shall commence telemetry studies to monitor the overall effectiveness of the NLF Facility, consistent with the following:

i. The telemetry studies will be conducted for at least two years, and potentially a third year if, after consultation with the Resource Agencies, it is determined to be necessary by YORK HAVEN or either the USFWS or PADEP in order to obtain observations over a range of high and low flows typical of American shad passage seasons on the Susquehanna River. In general, the range defining typical high and low flows during the American shad upstream passage season would be anticipated to be as follows:

(1) Typical low flow range: 22,000 cfs to 35,300 cfs.

(2) Typical high flow range: 35,300 cfs to 55,600 cfs.

ii. The telemetry studies will be planned to be conducted during successive shad passage seasons, but may be performed on a non-successive basis under the following circumstances:

(1) YORK HAVEN may postpone conducting the telemetry studies, after consultation with the Resource Agencies and with the approval of the USFWS and DEP, in the event that extenuating circumstances (such as the unusual flows, construction at downstream dams or other conditions) are interfering or expected to

interfere with upstream shad passage. The PADEP agrees that in the event that it becomes aware of circumstances that would warrant postponement of the telemetry studies, it will promptly notify YORK HAVEN, with the objective of providing notice to YORK HAVEN, to the extent practicable, as soon as possible prior to the anticipated start of the shad passage season.

(2) YORK HAVEN may postpone a successive season's telemetry study if YORK HAVEN determines, after consultation with the Resource Agencies and with the approval of USFWS and PADEP, that some physical adjustment to the NLF Facility is advisable based on the observations during the prior shad passage seasons, in which case YORK HAVEN shall implement the physical adjustments and perform the telemetry study during the American shad upstream passage season following implementation of the physical adjustment.

iii. The telemetry studies will utilize American shad tagged at the Safe Harbor Project, provided that access is granted by the owner of such Project or at such other location as required or approved by the PADEP in writing.

iv. The telemetry studies shall utilize radio telemetry, acoustic telemetry, or such other technologies as YORK HAVEN proposes and PADEP and the USFWS, after consultation with the other Resource Agencies, approve. The general parameters and protocols for such telemetry studies (number of fish, fish release sites, target areas for telemetry antennas) are described in Appendix C. At least 10 months prior to the start of the second Upstream American Shad Passage Season following completion of the NLF Facility, YORK HAVEN shall prepare and submit to the Resource Agencies for review an NLF Facility Monitoring Plan (the "NLF Monitoring Plan") containing detailed protocols for the telemetry studies.

YORK HAVEN shall confer with the Resource Agencies regarding the NLF Monitoring Plan, and shall provide for at least 90 days for PADEP and the USFWS to review and approve, and for the other Resource Agencies to review and comment on, the NLF Monitoring Plan.

c. Upstream American Shad Passage Target and Effectiveness Criteria:

i. The target established by the Resource Agencies is for at least 75% of the upstream migrating American shad passing the Safe Harbor Dam to pass upstream of the Project through the combination of the NLF Facility and the East Channel Fishway (the "Upstream Shad Passage Target"). The NLF Facility shall be designed and operated to be capable of achieving the Upstream Shad Passage Target, provided that adequate numbers of upstream migrating American shad reach the Project Area. YORK HAVEN shall not be deemed in violation of this condition if the Upstream Shad Passage Target is not achieved for reasons beyond the reasonable control of the Project. ("Project Area" is defined as the area upstream of a line drawn across the Susquehanna River from the downstream end of the powerhouse to the east bank of the river as depicted in Exhibit 1 to Appendix C hereto)

ii. The NLF Monitoring Plan is designed to investigate several issues: (i) whether the upriver migrating American shad passing the Safe Harbor Dam are reaching the Project Area; (ii) whether upriver migrating American Shad entering the Project Area are attracted to the downstream entrance of the NLF Facility; and (iii) whether there are barriers to American shad entering into and passing through the NLF Facility (e.g., velocity barriers or other constraints). Unless a different plan is approved by the DEP and the USFWS, the NLF Monitoring Plan shall be consistent with Appendix C, attached hereto.

iii. The NLF Facility will be deemed to be effective if: (1) in two consecutive years after installation or subsequent modification of the NLF Facility, (A) the Upstream Shad Passage Target, identified in paragraph

B.1.c.i. above, is achieved or (B) 85% of the tagged American shad that enter the Project Area exit the combination of the NLF Facility and the East Channel Fishway (the "Project Area Passage Success Criterion").

iv. If the telemetry studies show that the Project Area Passage Success Criterion is achieved in two successive American shad upstream passage seasons which reflect a range of flows typical of shad passage seasons on the Susquehanna River, the Project Area Passage Success Criterion will be deemed achieved and YORK HAVEN may terminate the telemetry studies.

v. If the telemetry studies show that the Project Area Passage Success Criterion is not achieved in two successive American shad upstream passage seasons, and such failure was not due to unusual or extenuating circumstances (such as unusual flow or temperature conditions), YORK HAVEN will undertake the actions set forth in Section B.1.d. below and then perform a telemetry study for at least two additional American shad upstream passage seasons to confirm achievement of the Project Area Passage Success Criterion.

d. YORK HAVEN shall, in consultation with the Resource Agencies, evaluate the fish movement data from the NLF Monitoring Plan to determine if there are barriers to timely passage of upstream migrating American shad within the Project Area. The Project area is the area from the downstream end of the powerhouse extending to the upstream exit of the NLF or East Channel Fishway, or such other area established by the DEP in writing after consultation with the Resource Agencies and York Haven. If such barriers to timely passage of upstream migrating American shad are identified within the Project Area, YORK HAVEN shall prepare and submit to the Resource Agencies a plan and schedule for those actions to address such conditions that are feasible, appropriate under the circumstances, reasonable and technically sound, provided that the Project shall not be required to undertake the curtailment of electric generating operations. Such plan shall be subject to review

and approval by PADEP and the USFWS and review and comment by the other Resource Agencies. Following approval by PADEP and the USFWS, YORK HAVEN shall implement the approved plan in accordance with the approved schedule.

e. If the Project Area Passage Success Criterion is not achieved, YORK HAVEN shall take the following measures, as appropriate and necessary, after consultation with the Resource Agencies:

   i. Evaluate fishway hydraulics and access for velocity and shear stress barriers, recognizing that hydraulics of the NLF Facility will vary with river flow and flow through the NLF Facility.

   ii. Adjust positions of rock weirs and attraction water discharge if necessary.

   iii. Adjust timing of supplemental attraction flows.

   iv. Install ultrasound to deter fish from an area (such as the Powerhouse or East Channel).

   v. Reduce flows in the East Channel to reduce attraction of American shad to the East Channel.

   vi. Adjust amount of supplemental attraction flows in the NLF Facility up to the Potential Increased Attraction Flow Value.

   vii. Evaluate whether potential barriers exist in the channel downstream of the Main Dam hindering fish movement to the entrance of the NLF Facility, and if reasonably necessary undertake feasible and cost-effective modifications to the channel to remove such barriers.

f. The upstream end of NLF Facility shall be designed to accommodate installation of Passive Integrated Transponder ("PIT") tag monitoring devices at such time as such PIT tag monitoring devices become available and feasible for reliably monitoring American shad exiting the NLF Facility. At such time as requested by PADEP or the USFWS, YORK HAVEN shall conduct a feasibility study to evaluate whether a PIT tag monitoring facility can be successfully installed and maintained near the upper end of the NLF Facility to reliably monitor American shad exiting the NLF Facility. YORK

HAVEN shall install PIT tag readers, or such other monitoring technology as may be required by the PADEP, after consultation with the Resource Agencies, at the NLF Facility when such technology has become available, feasible, and technically sound for measuring American shad passage in the conditions of the NLF Facility as mutually agreed to, after consultation with the Resource Agencies. Upon installation of the PIT tag readers, YORK HAVEN shall implement a PIT tag monitoring plan, or other monitoring techniques approved by the DEP in consultation with the other Resource Agencies, on a schedule approved by the DEP.

g. If at the end of implementation of the measures described above, or such longer time as established by the DEP, the results indicate that as measured as described above, less than 75% of the American shad that pass the Safe Harbor Dam pass through the Project and the Project Area Passage Success Criterion is not being achieved, within 6 months thereafter, YORK HAVEN shall propose a plan and schedule for mitigation, as defined in 25 Pa. Code Section 105.1 that is feasible, appropriate under the circumstances, reasonable and technically sound, provided that the Project shall not be required to undertake the curtailment of electric generating operations. This plan and schedule shall be submitted to the Resource Agencies for review and comment and to DEP for approval. YORK HAVEN shall implement the plan and schedule consistent with the approval of the DEP. In the event YORK HAVEN fails to submit the plan and schedule as required by this paragraph, the DEP, in consultation with the other Resource Agencies, may establish a plan and schedule and YORK HAVEN shall implement that plan and schedule consistent with the approval of the DEP.

2. Downstream Shad Passage of Post-Spawning Adult American Shad

a. YORK HAVEN shall provide for downstream passage of post-spawning adult American shad through maintenance of the existing Project and installation and operation of the NLF Facility, which shall achieve an 80% survival rate as demonstrated by implementation of the protocol set forth in Section b. below.

b. During the period of May 1 to June 30, if river flow exceeds the sum of Project Hydraulic Capacity, required flows through the NLF Facility, required flows through the East Channel, and required flows (if any) over the Main Dam, YORK HAVEN will open and spill water via the Forebay Sluice Gate (~370 cfs) to the extent practicable for a period of one to two hours during the morning on weekdays, subject to Project personnel availability and access requirements for operations and maintenance purposes. Such spilling may be provided in connection with opening of the Forebay Sluice Gate for purposes of passing debris, it being understood by the Parties that during the passage of debris, it will not be feasible to utilize the chute structure.

c. If after operational modifications are implemented YORK HAVEN cannot achieve 80% survival of adult American shad, YORK HAVEN shall propose a plan and schedule for mitigation, as defined in 25 Pa. Code Section 105.1 that is feasible, appropriate under the circumstances, reasonable and technically sound, provided that the Project shall not be required to undertake the curtailment of electric generating operations This plan and schedule shall be submitted to the Resource Agencies within 6 months from the date the DEP determines that YORK HAVEN failed to achieve the 80% survival target. YORK HAVEN shall implement the plan and schedule consistent with the approval of the DEP. In the event YORK HAVEN fails to submit the plan and schedule as required by this paragraph, the DEP, in consultation with the other Resource Agencies, may establish a plan and schedule and YORK HAVEN shall implement that plan and schedule consistent with the approval of the DEP.

3. Downstream Juvenile American Shad Passage

a. After issuance of the New License and until completion of the NLF Facility, YORK HAVEN shall implement the following protocol to facilitate downstream passage of juvenile American shad during the Downstream Juvenile American Shad Passage Period:

i. During the entire Downstream Juvenile American Shad Passage Period from October 1 until November 30, YORK HAVEN will operate the Project units in the following order of priority, depending upon available river flow: Unit 1-6 (Propeller units) may be

operated without restriction up to available river flow; (2) Unit 14 (larger single Francis unit) may be operated if river flow exceeds capacity of Units 1- 6; (3) Units 7-13 and 15-20 ~~30~~ (double Francis units) may be operated in ascending order if river flow exceeds capacity of Unit 1-6 and 14.

ii. During the entire Downstream Juvenile American Shad Passage Period, YORK HAVEN will open and spill water via the Forebay Sluice Gate (~ 370 cfs) between the hours of 5 pm to 11 pm Eastern Standard Time.

iii. If during the Downstream Juvenile American Shad Passage Period river flow exceeds the sum of Project Hydraulic Capacity, required flows through the East Channel, and required flows (if any) over the Main Dam, YORK HAVEN will open and spill water via the Forebay Sluice Gate (~370 cfs) to the extent practicable for one to two hours during the morning, subject to Project access requirements for operations and maintenance purposes, in order to provide for downstream juvenile American shad passage.

b. After completion of the NLF Facility, unless a different protocol is approved by the USFWS and the PADEP, YORK HAVEN shall implement the following protocol to facilitate downstream passage of juvenile American shad during the Downstream Juvenile American Shad Passage Period:

i. During the entire Downstream Juvenile American Shad Passage Period, YORK HAVEN will operate the Project units in the following order of priority, depending upon available River flow: (1) Unit 1-6 may be operated without restriction up to available river flow; (2) Unit 14 may be operated if river flow exceeds capacity of Units 1-6; (3) Units 7-13 and 15-20 ~~30~~ may be operated in ascending order if river flow exceeds capacity of Unit 1-6 and 14.

ii. During the entire Downstream Juvenile American Shad Passage Period, YORK HAVEN will open and spill water via the Forebay Sluice Gate (~ 370 cfs) between the hours of 5 pm to 11 pm EST.

iii. The NLF Facility will be operated to maintain a flow through the fishway of approximately 200 cfs.

iv. If during the Downstream Juvenile American Shad Passage Period river flow exceeds the sum of Project Hydraulic Capacity, required flows through the NLF Facility, required flows through the East Channel, and required flows (if any) over the Main Dam, YORK HAVEN will open and spill water via the Forebay Sluice Gate (~370 cfs) to the extent practicable for one to two hours during the morning, subject to Project access requirements for operations and maintenance purposes, in order to provide for downstream juvenile American shad passage.

c. The overall goal for juvenile American shad downstream passage is to achieve survival of 95% of juvenile American shad from above the Project powerhouse and dam to below the Project powerhouse and dam (the "Downstream Juvenile American Shad Passage Goal"). The effectiveness of downstream passage operations for juvenile American shad will be determined based upon (1) a route of passage analysis, and (2) confirmation that Forebay Sluice Gate provides for safe passage.

d. For purposes of the route of passage analysis, the DEP will assume that (1) juvenile American shad will pass through the NLF Facility, through the East Channel past the East Channel Dam, over the Main Dam, and into the head race in direct proportion to the amount of flow via each such route; (2) any juvenile American shad passing through the NLF Facility, through the East Channel past the East Channel Dam, over the Main Dam, or through the Forebay Sluice Gate will survive; (3) juvenile American shad that do not pass through the NLF Facility, through the East Channel past the East Channel Dam, over the Main Dam, or through the Forebay Sluice Gate will pass through the turbines that are being operated in accordance with the priorities set forth above, and absent observations to the contrary, are allocated between the operating turbines in proportion to the flow through each turbine; and (4) the survival rate of juvenile American shad passing through individual turbines (based on previous balloon tag and blade strike analyses) are as stated in Appendix D. Based upon the foregoing assumptions and confirmation that Forebay Sluice Gate provides for safe passage as described in Section f. below, the juvenile American shad passage goal of 95% would be met if at least

60% of the tagged juvenile American shad released into the headrace exit via the Forebay Sluice Gate (that is, pass downstream of the Project headrace without passing through the turbines) (the "Headrace Shad Turbine Avoidance Target"). Unless a different method is approved by the USFWS and the DEP in writing, YORK HAVEN shall test the downstream passage efficiency of the operating protocols described above by a PIT tag monitoring study. YORK HAVEN shall, in consultation with the Resource Agencies, prepare a plan and schedule for the Headrace Shad Turbine Avoidance Study for review and approval of the Resource Agencies, consistent with the design criteria set forth in Appendix F. The Project will be deemed to meet the Downstream Juvenile American Shad Passage Goal if (1) the Headrace Shad Turbine Avoidance Study shows that the Headrace Shad Turbine Avoidance Target is achieved and (2) YORK HAVEN complies with the provisions of Section III.B.3.e. below to establish conditions under which the Forebay Sluice Gate provides for safe passage of juvenile American shad.

e. Within four (4) years following License issuance and prior to performance of the downstream juvenile American shad studies referenced in Section III.B.3.d. above, YORK HAVEN shall prepare and submit to the Resource Agencies: (i) designs for a chute structure to convey flows beyond the roadway on the downstream side of the Cable Alley structure, meeting the design criteria set forth in Appendix E allowing juvenile and adult American shad to land unimpeded in the downstream pool; and (ii) removal of obstructions in or deepening of the downstream pool into which flows from the Forebay Sluice Gate land to provide an adequate depth of 1 foot for each 4 feet of drop into which juvenile or adult American shad may land. YORK HAVEN shall submit design plans for improvements and a proposed implementation schedule to the USFWS and PADEP for review and approval and to the other Resource Agencies for review and comment, and shall implement the proposed improvements in accordance with the approved designs and schedule by the PADEP. Any such required improvements shall be completed coincident with completion of the NLF Facility, and in advance of commencement of the monitoring described in Section III.B.3.d. above.

f. If the effectiveness monitoring conducted pursuant to Section III.B.3.d. above shows that the Headrace Shad Turbine Avoidance Target is not achieved, unless the USFWS and the DEP approve alternative measures, YORK HAVEN shall implement the following sequence of adaptive measures in the next passage season:

   i. Open the NLF supplemental flow gate (800 cfs) during the same schedule as the Forebay Sluice Gate is opened.

   ii. Suspend operation of certain Francis turbine units during the hours of 5-11 pm EST when river flows are between 15,000 cfs and 22,000 cfs during the Downstream Juvenile American Shad Passage Period, up to a total generation loss of 1,000 Megawatt hours ("MWh").

   iii. Such other measures as may be agreed to by YORK HAVEN, the USFWS and DEP, after consultation with the other Resource Agencies.

g. Unless the DEP and the USFWS approve a different time in writing, within two years of implementing the adaptive measures referenced in Section 3.f. above, YORK HAVEN shall conduct a follow-up Headrace Shad Turbine Avoidance Study following the protocols referenced in Section III.B.3.d. above. If the follow-up Headrace Shad Turbine Avoidance Study shows that Headrace Shad Turbine Avoidance Target is achieved, such adaptive measures shall continue to be implemented for the duration of the License.

h. If by January 1, 2028, (a) the Headrace Shad Turbine Avoidance Studies have not shown that Headrace Shad Turbine Avoidance Target is being achieved by adaptive measures implemented at the Project, and (b) based on all available information and after consultation with YORK HAVEN and the other Resource Agencies, the USFWS renders a final determination on the basis of the record reasonably finding that (i) YORK HAVEN has not demonstrated that the adaptive measures implemented at the Project are reasonably anticipated to meet the Downstream Juvenile American Shad Passage Goal, and (ii) additional measures that are reasonably required to achieve the

Downstream Juvenile American Shad Passage Goal (the "Additional Measures Determination") then:

i. Within 12 months of the Additional Measures Determination, YORK HAVEN shall, in consultation with the Resource Agencies, prepare a design and schedule for implementation of additional structural and operational measures reasonably anticipated to meet the Downstream Juvenile American Shad Passage Goal that are feasible, appropriate under the circumstances, reasonable and technically sound. YORK HAVEN shall evaluate, among other options, options for a Fish Guidance System ("FGS") as described in the report entitled *Evaluation of Fish Guidance Systems* (Draft April 2013), or other appropriate technology to achieve the Downstream juvenile American Shad Passage Goal. As part of the evaluation report, YORK HAVEN shall provide sufficient information to demonstrate the reasonable likelihood of the proposed option and measures to meet the Downstream Juvenile American Shad Passage Goal.

ii. Following approval of the design and schedule by the USFWS and DEP, after consultation with the other Resource Agencies, YORK HAVEN shall prepare and submit the applications for all required governmental approvals, including FERC approvals, and procure, install and implement the approved structural and/or operational measures in accordance with the approved schedule. Such approved measures shall be implemented by December 31, 2030 or such other date as agreed to by YORK HAVEN and the USFWS, after consultation with the other Resource Agencies, or as approved by FERC.

iii. If YORK HAVEN does not present a design and schedule for implementing additional structural and operational measures reasonably anticipated to meet the Downstream Juvenile American Shad Passage Goal that are feasible, appropriate under the circumstances, reasonable and technically sound, or based on all available information and after consultation with YORK HAVEN and the Resource Agencies, the DEP

does not approve YORK HAVEN's design and schedule for additional measures submitted pursuant to Section III.B.3.h. above, the DEP may prescribe such measures as the DEP determines are necessary for safe and effective passage of downstream migrating American shad and YORK HAVEN shall implement those measures within the schedule established by the DEP.

iv. Within one year after the implementation of the structural and operational measures implemented under Section III.B.3.h. above, YORK HAVEN shall perform a follow-up Headrace Shad Turbine Avoidance Study to evaluate the number of tagged juvenile American shad that exit the Forebay without exposure to the turbines.

C. Eel Passage

1. Upstream Eel Passage

YORK HAVEN shall provide for upstream passage of juvenile American eels through maintenance of the existing Project and installation of the NLF Facility. Based upon their present understanding of the behavior of juvenile American eels and the design of the NLF Facility, the USFWS expects that the existing design of the Project in conjunction with the installation of the NLF Facility will be adequate to provide for successful upstream passage of juvenile American eels past the Project, and no other measures are presently believed to be necessary for such upstream passage of juvenile American eels.

2. Downstream Eel Passage

a. The overall goal for silver American eel passage shall be to achieve effective passage and survival of 85% of silver eels from above the Project dams and powerhouse to below the Project dams and powerhouse (the "Downstream Eel Passage Goal").

b. YORK HAVEN shall cooperate with the Resource Agencies and other interested parties in the conduct of (1) a Lower Susquehanna River Downstream Eel Study to evaluate the timing, magnitude, duration, annual variation and environmental conditions associated with active migration of silver eels from tributaries stocked with elvers, through the lower Susquehanna River to the Chesapeake Bay; and (2) a

Site-Specific Route of Passage Study to evaluate the route of passage selected by migrating silver eels in the vicinity of the Project. The design criteria for the Lower Susquehanna River Downstream Eel Study and the Site-Specific Route of Passage Study are described in Appendix G.

c. At least 12 months prior to the anticipated date for completion of the NLF Facility, in consultation with the Resource Agencies, YORK HAVEN shall prepare a plan and schedule for conducting a discrete downstream passage effectiveness study ("Site-Specific Downstream Eel Study"), consisting of a Site Specific Route of Passage Study as described in Appendix G and an Eel Survival Study as described in Appendix H. YORK HAVEN shall submit the Site-Specific Downstream Eel Study plan and proposed schedule to the Resource Agencies, for review and approval by the USFWS and PADEP and for review and approval. YORK HAVEN, in cooperation with the Resource Agencies, shall conduct the Site-Specific Route of Passage Study following completion of the NLF Facility in accordance with the approved plan and schedule, and YORK HAVEN shall conduct the Eel Survival Study in accordance with the approved plan and schedule.

d. If the results of the Site-Specific Downstream Eel Passage Study indicate that the then existing Project operating measures and protocols achieve the Downstream Eel Passage Goal, then YORK HAVEN shall continue to implement those protocols and measures.

e. If the results of the Site-Specific Downstream Eel Passage Study indicate that the Project's existing operating measures and protocols do not achieve the Downstream Eel Passage Goal, YORK HAVEN will prepare and submit to the Resource Agencies a plan and schedule for evaluating the feasibility and costs of potential physical and/or operational modifications to the Project to facilitate downstream eel passage (the Downstream Eel Improvements Study). The Downstream Eel Improvements Study plan and schedule shall be subject to review and approval by PADEP and the USFWS and review and comment by the other Resource Agencies. YORK HAVEN shall conduct the Downstream Eel Improvements Study in accordance with the approved plan and schedule. The Downstream Eel Improvements Study will

consider and evaluate whether any of the following adaptive measures to facilitate downstream eel passage, which may be implemented in a sequence or in combination, are feasible, appropriate under the circumstances, reasonable and technically sound and are reasonably expected to contribute toward achievement of the Downstream Eel Passage Goal:

i. Adjustment to NLF Facility operations.

ii. Installation of current inducers.

iii. Modifications to the juvenile American shad protection measure.

iv. Installation of a fish guidance system.

v. Replacement of turbine runner systems with units designed to have a lower mortality impact upon silver eels.

vi. Other measures mutually agreed to by YORK HAVEN, the USFWS and PADEP, after consultation with the other Resource Agencies.

f. If the Downstream Eel Improvements Study identifies physical or operational adaptive measures listed in Section III.C.2.e. above to facilitate downstream eel passage that are feasible, appropriate under the circumstances, reasonable and technically sound, YORK HAVEN shall prepare a plan and schedule for implementing such measures and an estimation as to the ability of such measures to achieve the Downstream Eel Passage Goal, and will submit the plan and schedule to the Resources Agencies for review and approval by the USFWS and DEP and review and comment by the other Resource Agencies. Following approval of such plan and schedule, YORK HAVEN shall implement the measures described in the approved plan in accordance with the approval schedule.

g. Within 12 months following implementation of any such improvements, YORK HAVEN shall evaluate and provide a report to the Resource Agencies regarding the effectiveness of the measures in relation to achievement of the Downstream Eel Passage Goal.

h. If the adaptive measures implemented pursuant to the Downstream Eel Improvements Study do not result in achievement of the Downstream Eel Passage Goal, YORK HAVEN and the Resource Agencies shall on an annual basis

consult as to potential additional studies or adaptive measures that are or may become feasible, appropriate under the circumstances, reasonable and technically sound, and reasonably expected to contribute toward achievement of the Downstream Eel Passage Goal.

D. Resident Fish Passage

1. General Requirements

a. The term "resident fish species" means those fish species that occur in that portion of Susquehanna River that includes YORK HAVEN Project area, excluding anadromous and catadromous fish species.

b. The term "East Channel" means the channel of the Susquehanna River that lies between Three Mile Island and the eastern shore of the Susquehanna River.

c. The term "East Channel Fish Passage System" means the existing fish passage facilities maintained by YORK HAVEN Project on the East Channel.

d. YORK HAVEN Project shall operate and maintain the East Channel Fish Passage System to allow passage of resident fish species each year from April 1 through the earlier of December 15 or until the average daily river temperature, measured at either the United States Geological Survey gage at Harrisburg or at the temperature sensor at YORK HAVEN Project is equal to or less than 40 degrees Fahrenheit for three consecutive days.

e. The East Channel Fish Passage System shall be operated as required by this certification and the FOP.

f. During the period that the East Channel Fish Passage System is in operation for the passage of fish, YORK HAVEN Project shall manage debris to maintain the functioning and operability of the East Channel Fish Passage System sufficient to allow and not significantly impede the passage of fish.

g. The provisions of this resident fish passage condition shall be included in the FOP for YORK HAVEN Project.

2. Prior to Operation of the NLF

a. After the American shad upstream passage season and during the resident fish passage period referenced above, YORK

HAVEN shall operate the East Channel Fish Passage System to allow for passage of resident fish species and provide for corresponding flows in the East Channel as set forth in Section IV. below.

3. Subsequent to Completion of the NLF Facility

a. YORK HAVEN shall operate the NLF Facility as described in the FOP.

b. Except when the East Channel Fish Passage System must be closed for repairs and maintenance or except as otherwise approved by the PADEP in writing, YORK HAVEN shall leave the East Channel Fish Passage System open for passage of resident fish during the period April 1 through the end of the resident fish passage season (earlier of December 15 or until the average daily river temperature is ≤ 40 degrees Fahrenheit for three consecutive days).

IV. MINIMUM STREAM FLOW ("MSF")

A. Prior to Operation of the NLF

Unless alternative flows are approved by the DEP in writing, YORK HAVEN shall achieve the following.

1. Prior to completion and operation of the NLF Facility, Licensee shall operate the Project consistent with the following flow management criteria:

   a. During the American Shad Upstream Passage Season, the Project shall be operated to provide:

      i. An average daily minimum flow in East Channel below East Channel Dam of 2,000 cfs.

      ii. Spill over Main Dam of equal to or greater than 4,000 cfs.

   b. After American Shad Upstream Passage Season until end of resident fish passage season (earlier of December 15 or until the average daily river temperature is ≤ 40 degrees Fahrenheit for three consecutive days):

      i. The Project shall be operated to provide a minimum stream flow in East Channel below East Channel Dam of 400 cfs.

      ii. When river flows exceed hydraulic capacity of all available hydroelectric generating units, Licensee

shall manage flows above the hydraulic capacity of available units in accordance with the following objectives:

a. To maintain the minimum flow in the East Channel of 400 cfs.

b. To maintain sufficient flow at the Main Dam to assure flow is released to the main channel in accordance with the existing FOP, except during times of maintenance work on the Main Dam when reservoir levels are lowered to permit such maintenance to occur safely.

c. To provide additional attraction flows to the East Channel Fish Passage System through operation of the wheel gates within their design capacity.

d. In the event that the flow is not sufficient to meet all such objectives 1-3 above, such objectives will be implemented in the order of precedence listed above.

c. The Project shall be operated to maintain the following minimum flows below the Project (the total of flows through the Powerhouse, over the Main Dam and East Channel Dam):

i. 1,000 cfs or inflow from upstream, whichever is less, at all times.

ii. An average daily minimum flow of 2,500 cfs or inflow from upstream, whichever is less.

iii. Whenever inflow from upstream is less than 3,000 cfs, the Project shall be operated on a run-of-river basis, adding or suspending operations at turbines to reflect, to the extent practicable, inflow from upstream and without adding or suspending turbine operations to deliberately drawdown or store water for purposes of generating electricity in particular time periods.

iv. Minimum flows may be temporarily modified if required by operating exigencies beyond the control of the YORK HAVEN.

B. After NLF Facility Completion.

Unless an alternative minimum stream flow is approved by the DEP, after completion and operation of the NLF Facility, Licensee shall operate the Project consistent with the following flow management criteria:

1. During the American Shad Upstream Passage Season, the Project shall be operated to provide:
    i. An average daily minimum flow in East Channel below East Channel Dam of a minimum of 267 cfs, understanding that as river flow increases above 21,000 cfs, flows over the East Channel Dam will occur in excess of the minimum of 267 cfs.
    ii. Flow through the NLF Facility (passage channel plus supplemental attraction flow channel) equal to at least 5% of river flow when river flows above the Project are between 5,000 and 150,000 cfs.
2. During the remainder of the year (other than the American Shad upstream passage season), the Project shall be operated to provide:
    i. An average daily minimum flow in East Channel below the East Channel Dam of 267 cfs.
    ii. The NLF Facility will be designed and operated to convey a minimum of 200 cfs when the river elevation is at the elevation of the Main Dam.
    iii. When river flows exceed the hydraulic capacity of all available hydroelectric generating units, YORK HAVEN shall manage flows above the hydraulic capacity of available units in accordance with the following objectives:
        a. To maintain a minimum flow in the East Channel of 267 cfs, understanding that as river flow increases above 21,000 cfs, flows over the East Channel Dam will occur in excess of the minimum of 267 cfs.
        b. To maximize the remainder of flows above hydraulic capacity flowing over the Main Dam and through the NLF Facility. Within the limits of available flows in excess of the hydraulic capacity, except during the period of December 15 to the earlier of April 1 or the start of American Shad Upstream Passage Season, the supplemental attraction flow channel will

be operated with the objective of maintaining a maximum attraction flow through the NLF Facility.

3. The Project shall be operated to maintain the following minimum flows below the Project (the total of flows through the Powerhouse, over the Main Dam and East Channel Dam):

   i. 1,000 cfs or inflow from upstream, whichever is less, at all times.

   ii. An average daily minimum flow of 2,500 cfs or inflow from upstream, whichever is less.

   iii. Whenever inflow from upstream is less than 3,000 cfs, the Project shall be operated on a run-of-river basis, adding or suspending operations at turbines to reflect, to the extent practicable, inflow from upstream and without adding or suspending turbine operations to deliberately drawdown or store water for purposes of generating electricity in particular time periods.

i. Minimum flows may be temporarily modified if required by operating exigencies beyond the control of YORK HAVEN.

V. DEBRIS MANAGEMENT

A. Except as otherwise provided by the DEP in writing, YORK HAVEN shall (1) continue to implement its existing debris management program as described below; and (2) on or before January 15 of each calendar year, provide an annual contribution of $25,000 per year to the York County Conservation District or such other entity identified in writing by the DEP for the purposes of debris removal in the Lower Susquehanna River Watershed. The amount of the annual contribution shall be adjusted every ten years over the term of this certification. The amount of such adjustment shall be calculated to reflect the aggregate increase in the annual U.S. Department of Labor Consumer Price Index – (All Urban Consumers, All Items) over the ten year period. It is the understanding of the Parties that the York County Conservation District or such other identity identified by the DEP shall administer and utilize such funds for the sole purpose of debris removal in the Lower Susquehanna River Watershed.

B. Under the Project's debris management program, almost all of the debris arrives at the Project during high flow events when river flows far exceed the Project Hydraulic Capacity. Under such debris management program, much of that debris passes over the Main Dam and East Channel Dam, and debris that does not pass over the Main Dam or East Channel Dam accumulates in the forebay. Of the debris that enters the forebay, non-natural debris is removed from the accumulated debris in the forebay to the

extent that safety considerations permit, and the remaining (primarily organic) debris material is sluiced downstream through the Forebay Sluice Gate in the masonry non-overflow "cable alley" wall located at the downstream end of the forebay. Prior to opening the Forebay Sluice Gate for debris passage, YORK HAVEN shall notify PPL's Brunner Island Station that debris is to be sluiced at least one-hour prior to debris sluicing, absent extraordinary or emergency circumstances.

APPENDIX B

U.S. Department of the Interior Fishway Prescription for the York Haven Project No. 1888 (filed February 7, 2014, corrected July 15, 2015)[79]

8. Reservation of Authority to Prescribe Fishways

In order to allow for the timely implementation of fishways, including effectiveness measures, the Department requests that the Commission include the following condition in any license(s) it may issue for the Project:

> *Pursuant to section 18 of the Federal Power Act, the Secretary of the Interior herein exercises her authority under said Act by reserving that authority to prescribe fishways during the term of these licenses and by prescribing the fishways described in section 9 of the Department of the Interior's Prescription for Fishways at the Project.*

9. ~~Preliminary~~ Prescription for Fishways

Pursuant to section 18 of the Federal Power Act, as amended, the Secretary of the Department of the Interior, as delegated to the Service, proposes to exercises her authority to prescribe the construction, operation and maintenance of such fishways as deemed necessary, subject to the procedural provisions contained in Section 2 above.

The Department's ~~Preliminary~~ Prescription for Fishways reflects a number of issues and concerns related to fish restoration and passage that have been raised by the Licensee, Commission staff, state resource agencies, and other parties involved in these proceedings. Moreover, the Department, through the Service, reached settlement with the Licensee on matters of fish passage. The full range of issues settled are described in the Settlement Agreement, which includes its appendices.

Fishways shall be constructed, operated, and maintained to provide safe, timely and effective passage for American shad, alewife, blueback herring, and American eels and other designated resident riverine fish species at the Licensee's expense.

To ensure the immediate and timely contribution of the fishways to the ongoing and planned anadromous and catadromous fish restoration and enhancement program in the Susquehanna River, the following are included and shall be incorporated by the

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[79] Interior never filed to modify or withdraw its preliminary prescription. As such, this order treats the preliminary fishway prescription as the final and Interior's prescription is modified by deleting the word preliminary.

Commission to ensure the effectiveness of the fishways pursuant to section 1701(b) of the 1992 National Energy Policy Act (P.L. 102-486, Title XVII, 106 Stat. 3008).

9.1 Design Population: American Shad

Fish passage needs to be adequate to maintain self-sustaining annual populations of two million American shad reproducing in the free-flowing Susquehanna River above York Haven Dam and in suitable tributaries.

9.2 Design Population: River Herring (Alewife and Blueback Herring)

Fish passage needs to be adequate to maintain self-sustaining annual populations of five million river herring, reproducing in the free-flowing Susquehanna River above York Haven Dam and in suitable tributaries.

9.3 Design Population: American Eel

Fish passage needs to be adequate to pass all available upstream migrating eels that arrive to York Haven Dam to the mainstem of the Susquehanna River above the Project. Downstream migration of adult eels must be safe, timely and effective, achieving an 85% survival rate past the Project.

9.4 Operational Flows

Licensee shall operate the Project consistent with the flow management targets set forth below. The flow values set forth in this section are understood to be approximate and based upon reasonable engineering estimates.

9.4.1 Prior to NLF Facility Completion

Prior to completion and operation of the NLF Facility, Licensee shall operate the Project consistent with the following flow management criteria.

a. During the American Shad Upstream Passage Season

i) An average daily minimum flow in East Channel below East Channel Dam of 2,000 cfs.

ii) Spill over the Main Dam of equal to or greater than 4,000 cfs.

b. After the American Shad Upstream Passage Season until end of resident fish passage season (earlier of December 15 or until the average daily river temperature is less than or equal to 40 degrees Fahrenheit for three consecutive days)

i) The Project shall be operated to provide a minimum stream flow in the East Channel below East Channel Dam of 400 cfs.

ii) When river flows exceed hydraulic capacity of all available hydroelectric generating units, Licensee shall manage flows above the hydraulic capacity of available units in accordance with the following objectives:

(1) To maintain the minimum flow in the East Channel of 400 cfs.

(2) To maintain sufficient flow at the Main Dam to assure flow is released to the main channel in accordance with the existing Fish Passage Operational Plan (FPOP), except during times of maintenance work on the Main Dam when reservoir levels are lowered to permit such maintenance to occur safely.

(3) To provide additional attraction flows to the East Channel Fish Passage System through operation of the wheel gates within their design capacity.

9.4.2 After NLF Facility Completion

After completion and operation of the NLF Facility, Licensee shall operate the Project consistent with the following flow management criteria

a. During the American Shad Upstream Passage Season:

i) An average daily minimum flow in East Channel below East Channel Dam of a minimum of 267 cfs, understanding that as river flow increases above 21,000 cfs, flows over the East Channel Dam will occur in excess of the minimum of 267 cfs.

ii) Flow through the NLF Facility (passage channel plus supplement attraction flow channel) equal to at least 5% of river flow when river flows above the Project are between 5,000 and 150,000 cfs.

b. During the remainder of the year, the project shall be operated to provide:

i) An average daily minimum flow in the East Channel below the East Channel Dam of 267 cfs.

ii) The NLF Facility will be designed and operated to convey a minimum of 200 cfs when the river elevation is at the elevation of the Main Dam

iii) When river flows exceed the hydraulic capacity of all available hydroelectric generating units, the Licensee shall manage flows above the hydraulic capacity of available units in accordance with the following objectives:

(1) To maintain a minimum flow in the East Channel of 267 cfs, understanding that as river flow increases above 21,000 cfs, flows over the East Channel Dam will occur in excess of the minimum of 267 cfs.

(2) To maximize the remainder of flows above hydraulic capacity flowing over the Main Dam and through the NLF facility. Within the limits of available flows in excess of the hydraulic capacity, except during the period of December 15 to the earlier of April 1 or the start of the American Shad Upstream Passage Season, the supplemental attraction flow channel will be operated with the objective of maintaining a maximum attraction flow through the NLF Facility.

9.5 Scheduling

The timely installation of the prescribed fishway structures, facilities, or devices is a measure directly related to those structures, facilities, or devices and is necessary to ensure the effectiveness of such structures, facilities, or devices. Therefore, the Department's Prescription includes the express requirement that the Licensee notify and obtain approval from the Service for any extensions of time to comply with the provisions included in the Department's Prescriptions for fishways.

Regarding the timing of seasonal fishway operations, fishways shall be maintained and operated, at the Licensee's expense, to maximize fish passage effectiveness throughout the upstream and downstream migration periods for American shad, alewife, blueback herring, American eel, and designated resident riverine fish.

Table 1. Upstream and downstream migration periods for species covered in this Prescription for Fishways. (*)

Species	Upstream Migration Period	Downstream Migration Period
American shad	April 1 through June 15	July 1 through November 15 (juv.) April 15 through July 1 (adult)
Alewife & blueback herring	March 1** through June 15	June 15 through October 14 (juv.) April 15 through July 1 (adult)
American eel	April 1 through December 1, or whenever river temperature is above 50 degrees F ***	September 15–February 15, or whenever river temperature is above 37 degrees F ****

* Any of these migration periods may be changed during the term of the license by the Department, based on new information, and in consultation with the other fishery agencies and the licensee.

** This operational period is based on Alewife migration timing from other tributaries to the Chesapeake Bay (Sutherland 2000, Eyler et al. 2002, Slacum 2003)

*** This initial operational period is based on preliminary data on American eel migration timing from other tributaries to the Chesapeake Bay.

**** The Department is calling for the licensee to study the magnitude and timing of downstream eel migration through the project so that the effectiveness of a reduced period can be evaluated. This initial operational period is based on preliminary data on American eel migration timing from other tributaries to the Chesapeake Bay (Welsh et al. 2009).

9.6 Specific Prescriptions for the York Haven Project

9.7 General Requirements

9.8 Fishway Operating Procedures (FOP)

a. The FOP will include, for each fishway, schedules for routine maintenance, procedures for routine operations (including: seasonal and daily periods of operation, dam and powerhouse operational measures) detailing with how the plant shall be operated during fish passage season including sequencing of turbine

start-up and operation, debris management as well as any other necessary provisions for plant operation and related to attraction flow as a component of the fish passage system to the operation of the NLF, procedures for monitoring and reporting on the operation, and procedures for use in case of emergencies and Project outages significantly affecting fishway operations.

b. The Licensee shall implement the FOP consistent with the approval of the Service. The Licensee shall provide written documentation to the Resource Agencies that all fishway operational personnel have reviewed and understand the FOP signed by the operations manager of the Amended Project.

c. Copies of the approved FOP and all modifications will be provided to the Resource Agencies.

d. By December 31 of each year, following commencement of the Amended Project, the Licensee shall provide an annual report detailing; the implementation of the FOP, including any deviations from the FOP and a process to prevent those deviations in the future to the Resource Agencies; any proposed modifications to the FOP, or in the case of emergencies or Project outages, the steps taken by the Licensee to minimize adverse effects on fishway operation or fish passage measures; and any proposed modifications to those steps to further enhance their effectiveness in the future. The Licensee shall meet with the Resource Agencies by January 31 of each year unless a different date is mutually agreed upon by the Licensee and the Resource Agencies. Any required modifications to the FOP shall be submitted to the Resource Agencies within 30 days of receipt of a request for the modification unless a longer period is approved by the Service. The modifications to the FOP shall be implemented consistent with the approval of the Service. Nothing herein shall require the Licensee to make operational or structural changes related to the fish passage facilities and measures beyond those changes provided for in Section 9.9 hereof.

e. For fish passage system enhancements and facilities that do not begin operation with the entry into operation of the Amended Project, 60 days prior to operation of the enhancements and/or facilities, the Licensee shall submit FOP provisions for any such new fish passage enhancements, facilities and measures to the Resource Agencies for review and approval and shall implement the FOP as approved by the Service.

9.9 Fish Protection and Passage

9.9.1 Upstream Fish Passage / Nature-Like Fishway Construction

a. Licensee shall finance, design, permit and install a nature-like fishway facility (NLF Facility) in the vicinity of the apex of the Main Dam and Three Mile Island

(TMI) in substantial compliance with the design criteria for the NLF Facility set forth in the Settlement Agreement. Licensee shall complete engineering design, apply for and obtain required governmental approvals, construct, and place into operation the NLF Facility by November 30, 2021.

b. In consultation with the Resource Agencies, Licensee shall develop the final plans and specifications for the NLF consistent with the design concept and design criteria in Appendix A,[80] and shall submit such plans and specifications to the Resource Agencies, Licensee shall provide a minimum of 60 days for the Resource Agencies to submit comments on such plans and for review by the Service and PADEP. Such comments, review and approval shall not result in a material change. After approval of such plans by PADEP and the Service, Licensee shall submit such plans to the Commission for approval. Licensee shall include the final plans submitted to the Commission evidence of Licensee does not adopt a recommendation made by a Resource Agency other than PADEP and the Service, the filing shall include the Licensee's reasons together with supporting information. The plans shall not be implemented until the Licensee is notified that the plans are approved by the Commission. Upon Commission approval and the receipt of all other required governmental approvals, the Licensee shall implement the plans, including any changes required by the Commission.

9.9.2 NLF Facility Operations

Following construction of the NLF Facility, Licensee shall perform all required routine maintenance of the NLF Facility. Licensee shall conduct periodic inspections of the NLF Facility; and manage and remove debris from the NLF Facility to maintain the functioning and operability of the NLF Facility sufficient to allow and not significantly impede the passage of fish.

Licensee shall prepare an NLF Facility operations and maintenance plan (the "NLF O&M Plan"), and will submit the NLF O&M Plan for review by the Resource Agencies and for approval by PADEP and the Service. Following review and comment by the Resource Agencies, and approval by PADEP and Service, the Licensee shall submit the NLF O&M Plan to FERC, and shall implement the NLF O&M Plan for the duration of the License. Licensee shall include in the NLF O&M Plan submitted to the Commission documentation of approval by PADEP and the Service, consultation with the other Resource Agencies, copies of the Resource Agencies' comments and recommendations,

[80] Appendix A, D, E, G, and H are included by reference. They are integral to and attached to the Settlement Agreement on which this Preliminary Prescription for Fishways is based.

and a description of how the other Resource Agencies' comments are accommodated. Licensee shall provide a minimum of 30 days for review and approval of the NLF O&M Plan by PADEP and the Service and for review and comment by the other Resource Agencies.

Any amendment to the NLF O&M Plan that materially alters the operation, maintenance, monitoring or reporting procedures relating to the NLF Facility shall be subject to review and approval by PADEP and the Service, and review and comment by the other Resource Agencies.

Licensee shall provide copies of the approved NLF O&M Plan and all amendments thereto to the Commission and the Resource Agencies.

9.9.3 Monitoring of Shad Passage Effectiveness & Subsequent Actions

The Licensee shall perform post-construction monitoring of the NLF Facility in accordance with the following provisions in consultation with the Resource Agencies and submit the results of such monitoring to the Resource Agencies and the Commission.

(a) The period from completion of construction through the end of the first American shad upstream shad passage season following completion of the NLF Facility will be a "shake-down" period, during which Licensee shall conduct visual observations and make adjustments to the NLF Facility to address any unanticipated inhibitions or barriers that impede the NLF Facility's performance.

(b) Starting in the second American shad upstream passage season following completion of the NLF Facility, Licensee shall commence telemetry studies to monitor the overall effectiveness of the NLF Facility, consistent with the following:

(i) The telemetry studies will be conducted for at least two years, and potentially a third year if, after consultation with the Resource Agencies, determined to be necessary by the Licensee or either the Service or PADEP in order to obtain observations over a range of high and low flows typical of American shad passage seasons on the Susquehanna River. In general, the range defining typical high and low flows during the American shad upstream passage season would be anticipated to be as follows:

- Typical low flow range: 22,000 to 35,300 cfs.
- Typical high flow range: 35,300 cfs to 55,600 cfs.

(ii) The telemetry studies will be planned to be conducted during successive shad passage seasons, but may be performed on a non-successive basis under the following circumstances:

1. Licensee may postpone conduct of the telemetry studies, after consultation with the Resource Agencies and with the concurrence of the Service and PADEP, in the event that extenuating circumstances (such as the unusual flows, construction at downstream dams or other conditions) are interfering or expected to interfere with upstream shad passage. The Resource Agencies agree that in the event that they become aware of circumstances that would warrant postponement of the telemetry studies, they will promptly notify the Licensee, with the objective of providing notice to the Licensee to the extent practicable at least 90 days prior to the anticipated start of the shad passage season.

2. Licensee may postpone a successive season's telemetry study if Licensee determines, after consultation with the Resource Agencies and with the concurrence of Service and PADEP, that some physical adjustment to the NLF Facility is advisable based on the observations during the prior shad passage seasons, in which case Licensee shall will implement the physical adjustments and perform the telemetry study in the American shad upstream passage season following implementation of the physical adjustment.

(iii) The telemetry studies will utilize American shad tagged at the Safe Harbor Project, provided that access is granted by the owner of such Project.

(iv) The telemetry studies shall utilize radio telemetry, acoustic telemetry, or such other technologies as Licensee proposes and PADEP and the Service, after consultation with the other Resource Agencies, approve. The general parameters and protocols for such telemetry studies (number of fish, fish release sites, target areas for telemetry antennas) are described in Appendix D. At least 10 months prior to the start of the second Upstream American Shad Passage Season following completion of the NLF Facility, Licensee shall prepare and submit to the Resource Agencies for review an NLF Facility Monitoring Plan (the "NLF Monitoring Plan") containing detailed protocols for the telemetry studies. Licensee shall confer with the Resource Agencies regarding the NLF Monitoring Plan, and shall provide for at least 90 days for PADEP and the Service to review and approve, and for the other Resource Agencies to review and comment on, the NLF Monitoring Plan. At least five (5) months prior to the start of the second American shad upstream passage season following completion of the NLF

Facility, Licensee shall submit the NLF Monitoring Plan to the Commission for approval. If Licensee does not adopt a recommendation made by a Resource Agency, the filing with the Commission shall include the Licensee's reasons together with supporting information.

(c) Upstream American Shad Passage Target and Effectiveness Criteria:

(i) The target established by the Resource Agencies is for at least 75% of the upstream migrating American shad passing the Safe Harbor Dam to pass upstream of the Project through the combination of the NLF Facility and the East Channel Fishway (the "Upstream Shad Passage Target"). The NLF Facility shall be designed and operated to be capable of achieving the Upstream Shad Passage Target, provided that adequate numbers of upstream migrating American shad reach the Project Area. The Licensee shall not be deemed in violation of this condition if the Upstream Shad Passage Target is not achieved for reasons beyond the reasonable control of the Project, provided that the Licensee complies with Sections 9.9.3(c)(ii)-(v) and (d)-(f) below.

(ii) The NLF Monitoring Plan will be designed to investigate several issues: (i) whether the upriver migrating American shad passing the Safe Harbor Dam are reaching the Project Area; (ii) whether upriver migrating American Shad entering the Project Area are attracted to the downstream entrance of the NLF Facility; and (iii) whether there are barriers to American shad entering into and passing through the NLF Facility (e.g., velocity barriers or other constraints).

(iii) The NLF Facility will be deemed to be effective if: (1) in two consecutive years after installation or subsequent modification of the NLF Facility, (A) the Upstream Shad Passage Target is achieved or (B) 85% of the tagged American shad that enter the Project Area exit the combination of the NLF Facility and the East Channel Fishway (the "Project Area Passage Success Criterion"); and (2) Licensee complies with Section 9.9.3(d) below.

(iv) If the telemetry studies show that the Project Area Passage Success Criterion is achieved in two successive American shad upstream passage seasons which reflect a range of flows typical of shad passage seasons on the Susquehanna River, the Project Area Passage Success Criterion will be deemed achieved and the Licensee may terminate the telemetry studies.

(v) If the telemetry studies show that the Project Area Passage Success Criterion is not achieved in two successive American shad upstream passage seasons, and such failure was not due to unusual or extenuating

circumstances (such as unusual flow or temperature conditions), the Licensee will undertake the actions set forth in Section 9.9.3(e) and then perform a telemetry study for at least two additional American shad upstream passage seasons to confirm achievement of the Project Area Passage Success Criterion.

(d) Licensee shall, in consultation with the Resource Agencies, evaluate the fish movement data from the NLF Monitoring Plan to determine if there are barriers to timely passage of upstream migrating American shad within the Project Area. If such barriers to timely passage of upstream migrating American shad are identified within the Project Area, Licensee shall prepare and submit to the Resource Agencies a plan and schedule for those actions to address such conditions that are feasible, appropriate under the circumstances, reasonable and technically sound, provided that the Project shall not be required to undertake the curtailment of electric generating operations. Such plan shall be subject to review and approval by PADEP and the Service and review and comment by the other Resource Agencies. Following approval by PADEP and the Service, and as necessary FERC, Licensee shall implement the approved plan in accordance with the approved schedule.

(e) If the Project Area Passage Success Criterion is not achieved, Licensee shall take the following measures, as appropriate and necessary, after consultation with the Resource Agencies:

- Evaluate fishway hydraulics and access for velocity and shear stress barriers, recognizing that hydraulics of the NLF Facility will vary with river flow and flow through the NLF Facility.
- Adjust positions of rock weirs and attraction water discharge if necessary.
- Adjust timing of supplemental attraction flows.
- Install ultrasound to deter fish from an area (such as the Powerhouse or East Channel).
- Reduce flows in the East Channel to reduce attraction of American shad to the East Channel.
- Adjust amount of supplemental attraction flows in the NLF Facility up to the Potential Increased Attraction Flow Value.
- Evaluate whether potential barriers exist in the channel downstream of the Main Dam hindering fish movement to the entrance of the NLF

Facility, and if reasonably necessary undertake feasible and cost-effective modifications to the channel to remove such barriers.

(f) The upstream end of NLF Facility shall be designed to accommodate installation of Passive Integrated Transponder ("PIT") tag monitoring devices at such time as such PIT tag monitoring devices become available and feasible for reliably monitoring American shad exiting the NLF Facility. At such time as requested by PADEP or the Service, Licensee shall conduct a feasibility study to evaluate whether a PIT tag monitoring facility can be successfully installed and maintained near the upper end of the NLF Facility to reliably monitor American shad exiting the NLF Facility. Licensee shall install PIT tag readers, or such other monitoring technology as may be agreed upon, after consultation with the Resource Agencies, by the Licensee, the Service and PADEP, at the upstream end of the NLF Facility when such technology becomes available, feasible, and technically sound for measuring American shad passage in the conditions of the NLF Facility as mutually agreed to, after consultation with the Resource Agencies, by Licensee, the Service and PADEP. The Parties contemplate that such monitoring will use American shad tagged at Conowingo or Safe Harbor to monitor overall effectiveness of American shad upstream passage within the lower Susquehanna River.

9.9.4 Upstream Passage of Eels

Licensee shall provide for upstream passage of juvenile American eels through maintenance of the existing Project and installation of the NLF Facility. Based upon their present understanding of the behavior of juvenile American eels and the design of the NLF Facility, the Service expects that the existing design of the Project in conjunction with the installation of the NLF Facility will be adequate to provide for successful upstream passage of juvenile American eels past the Project, and no other PM&E measures are presently believed to be necessary for such upstream passage of juvenile American eels.

9.9.5 Downstream Post-Spawning Adult American Shad Passage

(a) Licensee shall provide for downstream passage of post-spawning adult American shad through maintenance of the existing Project, installation and operation of the NLF Facility, and implementation of the protocol set forth in Section 9.9.5(b).

(b) During the period of May 1 to June 30, if River Flow exceeds the sum of Project Hydraulic Capacity, required flows through the NLF Facility, required flows through the East Channel, and required flows (if any) over the Main Dam, the Licensee will open and spill water via the Forebay Sluice Gate (~370 cfs) to the extent practicable during one to two hours during the morning during

weekdays, subject to Project personnel availability and access requirements for operations and maintenance purposes. Such spilling may be provided in connection with opening of the Forebay Sluice Gate for purposes of passing debris, it being understood by the Parties that during the passage of debris, it will not be feasible to utilize the chute structure referenced in Section 9.9.6(e).

9.9.6 Downstream Juvenile American Shad Passage

(a) After issuance of the New License and until completion of the NLF Facility, Licensee shall implement the following protocol to facilitate downstream passage of juvenile American shad during the Downstream Juvenile American Shad Passage Period:

(i) During the entire Downstream Juvenile American Shad Passage Period, the Licensee will operate the Project units in the following order of priority, depending upon available River flow: (1) Unit 1-6 (Propeller units) may be operated without restriction up to available river flow; (2) Unit 14 (larger single Francis unit) may be operated if river flow exceeds capacity of Units 1- 6; (3) Units 7-13 and 15-20 (double Francis units) may be operated in ascending order if river flow exceeds capacity of Unit 1-6 and 14.

(ii) During the entire Downstream Juvenile American Shad Passage Period, the Licensee will open and spill water via the forebay sluice gate (~ 370 cfs) between the hours of 5 pm to 11 pm Eastern Standard Time ("EST").[81]

(iii) If River flow exceeds the sum of Project Hydraulic Capacity, required flows through the East Channel, and required flows (if any) over the Main Dam, the Licensee will open and spill water via the forebay sluice gate (~370 cfs) to the extent practicable for one to two hours during the morning, subject to Project access requirements for operations and maintenance purposes, in order to provide for downstream juvenile American shad passage.

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[81] Note: During the Downstream Juvenile American Shad Passage Season, a portion of the period is in daylight savings time and a portion is in standard time. All timeframes stated in this Offer of Settlement are stated in Eastern Standard Time. During October, sunset in the central Pennsylvania area is in a range of 5:50-5:05 pm EST. During November, sunset in central Pennsylvania occurs in a range of 5:05 pm to 4:42 pm EST.

(b) After completion of the NLF Facility, Licensee shall implement the following protocol to facilitate downstream passage of juvenile American shad during the Downstream Juvenile American Shad Passage Period:

(i) During the entire Downstream Juvenile American Shad Passage Period, the Licensee will operate the Project units in the following order of priority, depending upon available River flow: (1) Unit 1-6 may be operated without restriction up to available river flow); (2) Unit 14 may be operated if river flow exceeds capacity of Units 1-6; (3) Units 7-13 and 15-20 may be operated in ascending order if river flow exceeds capacity of Unit 1-6 and 14.

(ii) During the entire Downstream Juvenile American Shad Passage Period, the Licensee will open and spill water via the forebay sluice gate (~ 370 cfs) between the hours of 5 pm to 11 pm EST.

(iii) The NLF Facility will be operated to maintain a flow through the fishway of approximately 200 cfs.

(iv) If river flow exceeds the sum of Project Hydraulic Capacity, required flows through the NLF Facility, required flows through the East Channel, and required flows (if any) over the Main Dam, the Licensee will open and spill water via the forebay sluice gate (~370 cfs) to the extent practicable for one to two hours during the morning, subject to Project access requirements for operations and maintenance purposes, in order to provide for downstream juvenile American shad passage.

(c) The overall goal for juvenile American shad downstream passage is to achieve survival of 95% of juvenile American shad from above the Project powerhouse and dam to below the Project powerhouse and dam (the "Downstream Juvenile American Shad Passage Goal"). Measurement of such passage effectiveness and survival is subject to a margin of error. The effectiveness of downstream passage operations for juvenile American shad will be determined based upon (1) a route of passage analysis as described in Section 9.9.6(d), and (2) confirmation that Forebay Sluice Gate provides for safe passage as described in Section 9.9.6(e).

(d) For purposes of the route of passage analysis, the Service will assume that (1) juvenile American shad will pass through the NLF Facility, through the East Channel past the East Channel Dam, over the Main Dam, and into the head race in direct proportion to the amount of flow via each such route; (2) any juvenile American shad passing through the NLF Facility, through the East Channel past the East Channel Dam, over the Main Dam, or through the forebay sluice gate will survive; (3) juvenile American shad that do not pass through the NLF Facility, through the East Channel past the East Channel Dam, over the Main Dam, or

through the forebay sluice gate will pass through the turbines that are being operated in accordance with the priorities set forth in Section 9.9.6(b), and absent observations to the contrary, are allocated between the operating turbines in proportion to the flow through each turbine; and (4) the survival rate of juvenile American shad passing through individual turbines (based on previous balloon tag and blade strike analyses) are as stated in Appendix D. Based upon the foregoing assumptions and confirmation that Forebay Sluice Gate provides for safe passage as described in Section 9.9.6(f), the juvenile American shad passage goal of 95% would be met if at least 60% of the tagged juvenile American shad released into the headrace exit via the Forebay Sluice Gate (that is, pass downstream of the Project headrace without passing through the turbines) (the "Headrace Shad Turbine Avoidance Target"). Licensee shall test the downstream passage efficiency of the operating protocols described above by a PIT tag monitoring study. Licensee shall, in consultation with the Resource Agencies, prepare a plan and schedule for the Headrace Shad Turbine Avoidance Study for review and approval of the Resource Agencies, consistent with the design criteria set forth in Appendix D. The Project will be deemed to meet the Downstream Juvenile American Shad Passage Goal if (1) the Headrace Shad Turbine Avoidance Study shows that the Headrace Shad Turbine Avoidance Target is achieved and (2) the Licensee complies with the provisions of Section 9.9.6(f) to establish conditions under which the Forebay Sluice Gate provides for safe passage of juvenile American shad.

(e) Within four (4) years following License issuance and prior to performance of the downstream juvenile American shad studies referenced in Section 9.9.6(d), License shall prepare and submit to the Resource Agencies: (i) designs for a chute structure to convey flows beyond the roadway on the downstream side of the Cable Alley structure, meeting the design criteria set forth in Appendix E allowing juvenile and adult American shad to land unimpeded in the downstream pool; and (ii) removal of obstructions in or deepening of the downstream pool into which flows from the Forebay Sluice Gate land to provide an adequate depth of 1 foot for each 4 feet of drop into which juvenile or adult American shad may land. Licensee shall submit any design plans for improvements as described in this Section 9.9.6(e) and a proposed implementation schedule to the Service and PADEP for review and approval and to the other Resource Agencies for review and comment, and shall implement the proposed improvements in accordance with the approved designs and schedule. Any such required improvements shall be completed coincident with completion of the NLF Facility, and in advance of commencement of the monitoring described in Section 9.9.6(d).

(f) If the effectiveness monitoring conducted pursuant to Section 9.9.6(d) shows that the Headrace Shad Turbine Avoidance Target is not achieved, Licensee shall

implement the following sequence of adaptive measures in the next passage season:

(i) Open the NLF supplemental flow gate (800 cfs) during the same schedule as the Forebay Sluice Gate is opened.

(ii) Suspend operation of certain Francis turbine units during the hours of 5-11 pm EST when river flows are between 15,000 cfs and 22,000 cfs during the Downstream Juvenile American Shad Passage Period, up to a total generation loss of 1,000 Megawatt hours ("MWh").

(iii) Such other measures as may be agreed to by the Licensee, the Service and PADEP, after consultation with the other Resource Agencies, and (to the extent required) approved by the Commission.

(g) Within two years of implementing the adaptive measures referenced in Section 9.9.6(f), Licensee shall conduct a follow-up Headrace Shad Turbine Avoidance Study following the protocols referenced in Section 9.9.6(d). If the follow-up Headrace Shad Turbine Avoidance Study shows that Headrace Shad Turbine Avoidance Target is achieved, such adaptive measures shall continue to be implemented for the duration of the License.

(h) If by January 1, 2028, (a) the Headrace Shad Turbine Avoidance Studies have not shown that Headrace Shad Turbine Avoidance Target is being achieved by adaptive measures implemented at the Project, and (b) based on all available information and after consultation with Licensee and the other Resource Agencies, the Service renders a determination on the basis of the record reasonably finding that (i) Licensee has not demonstrated that the adaptive measures implemented at the Project are reasonably anticipated to meet the Downstream Juvenile American Shad Passage Goal, and (ii) additional measures that are reasonably required to achieve the Downstream Juvenile American Shad Passage Goal (the "Additional Measures Determination") (which Additional Measures Determination shall be subject to the dispute resolution / appeal procedures set forth in the Settlement):

(i) Within 12 months of the Additional Measures Determination, Licensee shall, in consultation with the Resource Agencies, prepare a design and schedule for implementation of additional structural and operational measures reasonably anticipated to meet the Downstream Juvenile American Shad Passage Goal that are feasible, appropriate under the circumstances, reasonable and technically sound. Licensee shall evaluate, among other options, options for a Fish Guidance System ("FGS") as described in the report entitled *Evaluation of Fish Guidance Systems* (Draft April 2013), or other appropriate technology to achieve the Downstream juvenile American shad Passage Goal. As part of the

evaluation report, Licensee shall provide sufficient information to demonstrate the reasonably likelihood of the proposed option and measures to meet the Downstream Juvenile American Shad Passage Goal.

(ii) Following approval of the design and schedule by the Service and PADEP, after consultation with the other Resource Agencies, Licensee shall prepare and submit the applications for all required governmental approvals, including FERC approvals, and procure, install and implement the approved structural and/or operational measures in accordance with the approved schedule. Such approved measures shall be implemented by December 31, 2030 or such other date as agreed to by Licensee and the Service, after consultation with the other Resource Agencies, or as approved by FERC.

(iii) If Licensee does not present a design and schedule for implementing additional structural and operational measures reasonably anticipated to meet the Downstream Juvenile American Shad Passage Goal that are feasible, appropriate under the circumstances, reasonable and technically sound, or based on all available information and after consultation with Licensee and the Resource Agencies, the Service does not approve the Licensee's design and schedule for additional measures submitted pursuant to Section 9.9.6(h)(i), the Service may elect to exercise its reserved authority to prescribe such measures as the Service determines are necessary for safe and effective passage of downstream migrating American shad; and Licensee retains all rights to challenge any such exercise of reserved authority.

(i) Within one year after the implementation of the structural and operational measures implemented under Section 9.9.6(h), Licensee shall perform a follow-up Headrace Shad Turbine Avoidance Study to evaluate the number of tagged juvenile American shad that exit the Forebay without exposure to the turbines.

9.9.7 Downstream Passage for Silver Eels

Licensee shall provide for the downstream passage of silver eels in accordance with this Section.

(a) The overall goal for silver American eel passage shall be to achieve effective passage and survival of 85% of silver eels from above the Project dams and powerhouse to below the Project dams and powerhouse (the "Downstream Eel Passage Goal"). Measurement of such passage effectiveness and survival is subject to a margin of error.

(b) Licensee shall cooperate with the Resource Agencies and other interested parties in the conduct of (1) a Lower Susquehanna River Downstream Eel Study to evaluate the timing, magnitude, duration, annual variation and environmental conditions associated with active migration of silver eels from tributaries stocked with elvers, through the lower Susquehanna River to the Chesapeake Bay; and (2) a Site-Specific Route of Passage Study to evaluate the route of passage selected migrating silver eels in the vicinity of the Project. The design criteria for the Lower Susquehanna River Downstream Eel Study and the Site-Specific Route of Passage Study are described in Appendix G.

(c) At least 12 months prior to the anticipated date for completion of the NLF Facility, in consultation with the Resource Agencies, Licensee shall prepare a plan and schedule for conducting a discrete downstream passage effectiveness study ("Site-Specific Downstream Eel Study"), consisting of a Site Specific Route of Passage Study as described in Appendix G and an Eel Survival Study as described in Appendix H. Licensee shall submit the Site-Specific Downstream Eel Study plan and proposed schedule to the Resource Agencies, for review and approval by the Service and PADEP and for review and comment by the other Resource Agencies. Licensee, in cooperation with the Resource Agencies, shall conduct the Site-Specific Route of Passage Study following completion of the NLF Facility in accordance with the approved plan and schedule, and Licensee shall conduct the Eel Survival Study in accordance with the approved plan and schedule.

(d) If the results of the Site-Specific Downstream Eel Passage Study indicate that the then existing Project operating measures and protocols achieve the Downstream Eel Passage Goal, then the Licensee shall continue to implement those protocols and measures.

(e) If the results of the Site-Specific Downstream Eel Passage Study do not indicate that the Project's existing operating measures and protocols do not achieve the Downstream Eel Passage Goal, the Licensee will prepare and submit to the Resource Agencies a plan and schedule for evaluating the feasibility and costs of potential physical and/or operational modifications to the Project to facilitate downstream eel passage (the Downstream Eel Improvements Study). The Downstream Eel Improvements Study plan and schedule shall be subject to review and approval by PADEP and the Service and review and comment by the other Resource Agencies. Licensee shall conduct the Downstream Eel Improvements Study in accordance with the approved plan and schedule. The Downstream Eel Improvements Study will consider and evaluate whether any of the following adaptive measures to facilitate downstream eel passage, which may be implemented in a sequence or in combination, are feasible, appropriate under the circumstances, reasonable and technically sound and are reasonably expected to contribute toward achievement of the Downstream Eel Passage Goal:

(i) Adjustment to NLF Facility operations.
(ii) Installation of current inducers.
(iii) Modifications to the juvenile American shad protection measure.
(iv) Installation of a fish guidance system.
(v) Replacement of turbine runner systems with units designed to have a lower mortality impact upon silver eels.
(vi) Other measures mutually agreed to by the Licensee, the Service and PADEP, after consultation with the other Resource Agencies.

(f) If the Downstream Eel Improvements Study identifies physical or operational adaptive measures listed in Section 9.9.7(e) to facilitate downstream eel passage that are feasible, appropriate under the circumstances, reasonable and technically sound, Licensee shall prepare a plan and schedule for implementing such measures and an estimation as to the ability of such measures to achieve the Downstream Eel Passage Goal, and will submit the plan and schedule to the Resources Agencies for review and approval by the Service and PADEP and review and comment by the other Resource Agencies. Following approval of such plan and schedule, Licensee shall implement the measures described in the approved plan in accordance with the approval schedule. If Licensee does not present such a plan and schedule for implementing physical or operational adaptive measures listed in Section 9.9.7(e) that are feasible, appropriate under the circumstances, reasonable and technically sound, and reasonably anticipated to meet the Downstream Eel Passage Goal, or based on all available information and after consultation with Licensee and the Resource Agencies, the Service does not approve the Licensee's plan and schedule for such measures submitted pursuant to this Section, the Service may elect to exercise its reserved authority to prescribe such measures as the Service determines are necessary for safe and effective passage of downstream migrating American eel; and Licensee retains all rights to challenge any such exercise of reserved authority.

(g) Within 12 months following implementation of any such improvements, Licensee shall evaluate and provide a report to the Resource Agencies regarding the effectiveness of the measures in relation to achievement of the Downstream Eel Passage Goal.

(h) If the adaptive measures implemented pursuant to the Downstream Eel Improvements Study do not result in achievement of the Downstream Eel Passage Goal, the Licensee and the Resource Agencies shall on an annual basis consult as to potential additional studies or adaptive measures that are or may become feasible, appropriate under the circumstances, reasonable and technically sound, and reasonably expected to contribute toward achievement of the Downstream Eel Passage Goal.

Document Content(s)