



YHPC,LLC

York Haven Power Company

Water Power for the Future

February 23, 2023

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
ATTN: OEP/DHAC
888 First Street, NE
Washington, DC 20426

RE: York Haven Hydroelectric Project (FERC No. 1888-036)
Article 401(b) – 2022 Fish Passage Operating Report

Dear Secretary Bose:

In accordance with Article 401(b) of the Project license, the Pennsylvania Department of Environmental Protection (Pennsylvania DEP) Water Quality Certification (WQC), and the U.S. Fish and Wildlife Service (FWS) fishway prescription, York Haven Power Company, LLC (York Haven) has enclosed the 2022 Fish Passage Operating Report (Report) for Commission review. The Report must be filed with the Commission annually by March 1, or within 30 days of the annual meeting, whichever is sooner. The Report must document Agency consultation.

York Haven distributed the 2022 draft Report to PADEP, USFWS, and other agencies, for review and comment on December 30, 2022. USFWS, PADEP, and Maryland Department of Natural Resources (MDDNR) provided comments on January 17, January 18, and February 1, 2023, respectively. YHPC responded to the USFWS comments on January 27, 2023. YHPC hosted a virtual meeting with PADEP, PAFBC, USFWS, MDDNR, and other agencies, on January 30, 2023, to review and discuss the Report. The PADEP Report comment was addressed during the January 30 meeting. The enclosed Report incorporates and responds to the MDDNR comments. Documentation of Agency consultation is appended to the Report.

If you have any questions regarding this notice, please contact me at (804) 338-5110 or joyce.foster@eaglecreekre.com.

Sincerely,

Joyce Foster
Director, Licensing and Compliance
York Haven Power Company, LLC

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SUMMARY OF UPSTREAM AND DOWNSTREAM FISH PASSAGE AT THE YORK HAVEN HYDROELECTRIC PROJECT IN 2022

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February 2023

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EXECUTIVE SUMMARY

In 2022, Constellation Energy Generation, LLC (Conowingo), with Resource Agency approval, operated the East and West Lifts to support trap and transport of American Shad and River Herring. Conowingo agreed to transport and release American Shad and River Herring upriver, roughly 80% were to be transported and released above York Haven Dam and the remaining 20% were to be released upstream of Safe Harbor Dam. Conowingo also agreed to remove Northern Snakeheads, Flathead Catfish and Blue Catfish from the Lift catch, as they are considered to be an invasive species by the Maryland Department of Natural Resources (“MDNR”). Because volitional passage was suspended at the East Lift, the Resource Agencies and Brookfield Renewable Partners L.P. agreed to suspend Lift operations at Holtwood and Safe Harbor. York Haven Power Company (“YHPC”) agreed to staff the East Channel Fishway in 2022 four days after 500 shad were transported from the Conowingo Lifts and stocked downstream of York Haven.

A total of 4,597 American Shad were collected at the Conowingo East and West Lifts in 2022; 2,283 and 2,314 American Shad were collected at the East and West Lifts, respectively. Some 4,319 American Shad, 681 Alewife, and 40 Blueback Herring were transported upstream from Conowingo in 2022. A total of 797 American Shad were transported and released above Safe Harbor Dam at the Columbia Boat Ramp and 3,522 American Shad were released at the Canal Lock Boat Ramp upstream of York Haven. A total of 77 Alewife and 27 Blueback Herring transported and released above at the Columbia Boat Ramp and 604 Alewife and 13 Blueback Herring were released upstream of York Haven.

Fishway preparations began in early March and volitional passage (not staffed) began on March 30. Between March 30 and May 21, a 53-day period, the entrance and exit gates were opened and the North Fixed Wheel Gate was opened and set to deliver a minimum of 400 cfs to the East Channel. On Sunday, May 22, 4 days after 500 shad had been transported from the Conowingo East and West Lifts and stocked below York Haven Dam the Fishway was staffed to count fish. The Fishway was staffed on a total of 13 days between May 22 and June 3. Generally, during this period, fish were counted and allowed to pass upstream daily between 0800 and 1600 hrs. However, counting was limited to 2 hours on May 23 between 1400 and 1600 hrs, because the entrance gate could not be opened fully (set 100% in gate pocket). At 1600 hours on June 3, Fishway operation was set to provide resident fish passage (volitional) through December 19 when it was closed.

During staffed Fishway operation 2,173 fish of 11 taxa were enumerated as they passed upstream into Lake Frederic. Channel Catfish (1,264) was the dominant fish species passed and comprised 58.2% of the fish passed. A total of 2 American Shad and 3 Blueback Herring were counted as they passed through the ladder. Other predominant fishes passed included Gizzard Shad (451), Carp (258), and Smallmouth Bass (105). Passage varied daily and ranged from 456 fish on May 24 when 21.0% of the season total was passed to 45 fish on May 23.

A total of two American Shad passed upstream through the ladder on May 30 between 1100 hrs and 1200 hrs. The two American Shad passed at a water temperature of 76.9°F, River flow of 19,300 cfs and East Channel flow of 2,750 cfs.

Downstream passage through the forebay sluice gate of adult American Shad occurred from May 1 to June 30. The forebay Sluice Gate was opened as required (~370 cfs) for 1 to 2 hours, Monday through Friday, on 21 days in May and 9 days in June when river flows exceeded the sum of the Project capacity, East Channel discharge, and Main Dam spill. No

physical observations of post-spawned adult American Shad were noted by Station personnel. During the post-spawned adult downstream passage period, river flow varied from 10,800 cfs to 156,000 cfs. Average daily water temperature at the Project (Fishway) varied by 24.3 degrees and ranged from a low of 55.0°F on May 8 to a high low of 79.3°F on June 2.

During the juvenile American Shad passage period (JASPP), river flow varied from 7,290 cfs to 87,500 cfs and was less than the hydraulic capacity (17,000 cfs) of the Station on 40 days: October 1 to 5 and October 10 to November 12. In contrast, 22-year average river flow values (2000 to 2022) always exceeded the hydraulic capacity of the station and varied from 17,919 cfs to 49,911 cfs. Average daily water temperature at the Project (Fishway) during the JASPP varied by almost 30 degrees and ranged from a high of 68.3°F on October 16 to a low of 38.4°F on November 30. Excluding discrete periods of operation during turbine survival testing at Unit 18 on November 1, 2, and 14, Station generation data for October and November confirm that Turbine Unit operation followed the JASPP operating guidelines. In accordance with the Projects FERC License and 401 Water Quality Certification, the Sluice Gate was opened between 14.5 to 24 hours daily from October 1 to November 30 to provide downstream passage of juvenile shad. The Sluice Gate was closed from 0700 hrs to 1400 hrs during the week and the Sluice Gate was left open from 1400 hrs of Friday until 0700 hrs on Monday.

1.0 INTRODUCTION

Upstream and downstream fish passage operation at York Haven Hydroelectric Project (FERC No. 1888) is provided for in the Project's FERC License (FERC, 2015) and the Pennsylvania Department of Environmental Protection Water Quality Certification (PA DEP, 2014) issued on December 22, 2015, and August 19, 2014, respectively. During the American Shad upstream passage season, the Project is required to provide a minimum flow of 2,000 cfs in the East Channel and spill 4,000 cfs at the Main Dam. The Project is also required to operate and maintain the East Channel Fishway (Fishway) 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 is 40°F for three consecutive days. During resident fish passage operation, the Project is required to provide a minimum stream flow of 400 cfs in the East Channel below the East Channel Dam. In addition, the Project is also required to spill water to provide for the downstream passage of adult and juvenile American Shad from May 1 to June 30 and from October 1 to November 30, respectively.

Fish passage operation is overseen by a Fish Passage Technical Advisory Committee ("FPTAC") comprised of representatives of the U.S. Department of the Interior represented by the Fish and Wildlife Service ("USFWS"), the Susquehanna River Basin Commission ("SRBC"), the states of Maryland and Pennsylvania and their involved agencies – Maryland Department of Natural Resources ("MDNR"), Pennsylvania Fish and Boat Commission ("PFBC") and Pennsylvania Department of Environmental Resources ("PADEP"). The FPTAC is responsible for reviewing and monitoring the maintenance and operation of the fish passage facilities at the Project, reviewing and providing comments on the annual report, and recommending studies and/or modifications to improve upstream and downstream passage. YHPC had a conference call with the York Haven FPTAC and other interested agencies on January 20, 2022, to review the 2021 Annual Fish Passage Report and discuss a USFWS request to modify the trigger for staffed Fishway operation during the spring migratory fish passage season. Based on these discussions, YHPC agreed to staff the Fishway in 2022 four days after 500 American Shad were transported from the Conowingo East and West Lifts and stocked downstream of York Haven.

In 2022, Conowingo, with Resource Agency approval, operated the East and West Lifts to support trap and transport of American Shad and River Herring. Conowingo agreed to transport and release American Shad and River Herring upriver, 80% were to be transported and released above York Haven Dam and the remaining 20% were to be released upstream of Safe Harbor Dam. Conowingo also agreed to remove Northern Snakeheads, Flathead Catfish, and Blue Catfish from the East and West Lift catch, as they are considered to be invasive species by the MDNR. Because volitional passage was suspended at the East Lift, the Resource Agencies and Brookfield Renewable Partners L.P. agreed to suspend lift operations at Holtwood and Safe Harbor.

A total of 4,597 American Shad were collected at the Conowingo East and West Lifts in 2022; 2,283 and 2,314 American Shad were collected at the East and West Lifts, respectively. Some 4,319 American Shad, 681 Alewife, and 40 Blueback Herring were transported upstream from Conowingo in 2022. A total of 797 American Shad were transported and released above Safe Harbor Dam at the Columbia Boat Ramp and 3,522 American Shad were released at the Canal Lock Boat Ramp upstream of York Haven. A total of 77 Alewife and 27 Blueback Herring were transported and released at the Columbia Boat Ramp and 604 Alewife and 13 Blueback Herring were released upstream of York Haven.

2.0 YORK HAVEN FISHWAY OPERATIONS

The installation and operation of the Fishway are part of a cooperative private, state and federal effort to restore American Shad (*Alosa sapidissima*) and other migratory fish to the Susquehanna River. In 1997, YHPC and the Resource Agencies reached a settlement agreement to revise the type and location of the York Haven fish passage facility. The Fishway is located in Dauphin County, Pennsylvania at the Three Mile Island end of the East Channel Dam at the Project. The Fishway was placed in service by YHPC in April 2000.

Fishway operation coincides with a springtime minimum flow release in accordance with the Projects License and Water Quality Certification. YHPC maintains a spill of up to 4,000 cfs over the Main Dam and a minimum release of approximately 2,000 cfs in the East Channel during spring Fishway operation. River flow in excess of spring minimum flow requirements and station capacity is spilled over the Main and East Channel Dams.

2.1 Project Operation

The hydroelectric station located in York Haven, Pennsylvania built in 1904, is located at River mile 55 in Dauphin and York counties, Pennsylvania (Figure 1). It is the fourth upstream hydroelectric dam on the River. The Project is a 20 unit run-of-river facility capable of producing approximately 19 MW and has an estimated hydraulic capacity of 17,000 cfs. It includes two dams that impound approximately 5 miles of the River forming Lake Frederic. The Main Dam is approximately 5,000-ft long, with a maximum height of 17 ft. The East Channel Dam is approximately 925-ft long with a maximum height of 9 ft. When River flow exceeds station hydraulic capacity (55% of the year), water is spilled over the two dams. During the spring spawning season, river flows in excess of spring minimum flow requirements were spilled over the Main and East Channel dams.

2.2 Fishway Design, Maintenance and Operation

2.2.1 Fishway Design

Fishway design incorporated numerous criteria established by the USFWS and the other Resource Agencies. The Fishway has an operating limit of 150,000 cfs River flow (East Channel flow limit of approximately 22,000 cfs). The Fishway includes two sections; a “weir cut” and a vertical notch fish ladder. Figure 2 provides the general arrangement of the Fishway. A detailed description of the Fishway and its major components is located in 2000 and 2001 summary reports (Kleinschmidt 2000 and 2002). Volitional passage at the Fishway is to begin on or about April 1, conditions permitting.

2.2.2 Fishway Maintenance

Per the York Haven Fishway Operation Procedure (YHPC, LLC and Kleinschmidt, 2019) preparation and maintenance of the Fishway began in early March. The Fishway was inspected, and repairs undertaken which enabled the Fishway to open on March 30. Additionally, the 10-year diffuser inspection was completed using a remote operated vehicle. No issues were noted. Major repairs undertaken and completed in 2022 included the replacement of the Fishway entrance gate actuator.

Resident fish passage operation is scheduled to end on December 15 or when the average daily water temperature is ≤ 40 degrees Fahrenheit for three consecutive days. Thus, in the beginning of December, YHPC contacted its supplemental labor contractor and developed a plan and schedule to close the Fishway. While the Fishway is closed, it is inspected, and minor repairs are completed. The Fishway was closed on December 19.

2.2.3 Fishway Operation

Fishway preparations began in early March and volitional passage (not staffed) began on March 30. Between March 30 and May 21, a 53-day period, the entrance and exit gates were opened and the adjustable crowder gate was set to full open (24 inches). Typically, during volitional passage, the North fixed wheel gate is opened and set to deliver a minimum of 400 cfs to the East Channel. However, both fixed wheel gates were opened on the afternoon of May 19, in preparation for a Resource Agency site visit scheduled on May 20.

The Fishway was staffed on Sunday, May 22, four days after 500 shad had been transported from the Conowingo East and West Lifts and stocked below York Haven Dam. In 2022, the Fishway was manned on a total of 13 days between May 22 and June 3. Generally, during this period, fish were counted and allowed to pass upstream daily between 0800 and 1600 hrs. However, counting was limited to 2 hours on May 23, between 1400 and 1600 hrs, because the entrance gate could not be opened fully (set 100% in gate pocket). At 1600 hours on June 3, with Resource Agency approval, Fishway operation was set to provide resident fish passage (volitional) through December 19 when the Fishway was closed for the year.

Between the afternoon of May 19 and June 3, both fixed wheel gates were fully opened. These gates remained open throughout the spring spawning migration. The entrance gate was the only gate that was adjusted throughout the migratory fish passage season. The differential between the surface water elevation downstream of the entrance and the water elevation in the diffuser area of the fish ladder at the entrance gate was normally 0.5 ft to 0.6 ft. The 7-ft wide stop gate, located between the weir and the fish ladder entrance, remained closed during the entire period of operation.

Excluding the first and last day the Fishway was staffed, the Fishway was typically staffed by one person. This person, a biologist or technician, adjusted the position of the entrance gate, counted and recorded the number of fish that passed through the ladder hourly, removed debris from the exit of the ladder, made visual observations of fish activity and movement in and through the ladder. These individuals also recorded water elevations several times each day on staff gauges located throughout the Fishway.

With Resource Agency approval, staffed Fishway operation ended at 1600 hours on June 3 (Appendix I), when the South fixed wheel gate was closed, and the North fixed wheel gate and ladder was set to deliver at least 400 cfs into the East Channel. However, from 0830 hrs on September 26 to 1000 hrs on October 6, both fixed wheel gates were opened, resulting in a flow of at least 2,000 cfs in the East Channel. Both fixed wheel gates were opened in order to eliminate spill at the Main Dam to facilitate maintenance activities being conducted on the Main Dam. The Fishway provided volitional passage until it was closed on December 19.

Water temperature¹ was collected in the Fishway at 60-minute intervals from March 31 through December 19 (Appendix II) with an Onset Hobo Water Temperature Pro v2 Data Logger (U22-001) that has a ± 0.4 °F accuracy. The monitor was suspended approximately 4 ft above the bottom (Elev. 274.63 ft) of the Fishway exit flume opposite the counting window on the east side of the exit flume (Figure 2). Average daily water temperature during the spring (Figure 3) increased over 34 degrees and ranged from a low of 44.8°F on March 31 to a high of 79.3°F on June 2.

2.2.4 Fish Counts

Fish that passed through the ladder were identified to species and enumerated as they passed the counting window by a biologist and/or technician. A description of the procedures used to count fish is described in prior annual operating reports (Kleinschmidt 2000 and 2002). Fish passage by the viewing window was controlled by opening or closing an aluminum grating gate with an electric hoist that was controlled from inside the viewing room. The stop gate was opened each morning at 0800 hrs and closed nightly at 1600 hrs when the Fishway was manned. Occasionally, it was closed for brief periods of time as needed each day to enable personnel staffing the Fishway to remove debris from screens at the fishway exit and to conduct other activities. In addition, in an effort to improve viewing, the adjustable crowder screen was adjusted as needed to allow all fish that passed to be observed. Gate settings on the days the Fishway was staffed varied from 11 to 20 inches

As in previous seasons, fish passage data was entered on a field data sheet and uploaded into a computer. Files were uploaded each evening, checked and corrected as necessary. Data reporting was PC-based and accomplished by program scripts, or macros, created within Microsoft Excel spreadsheets. Passage data and operational conditions were supplied electronically to YHPC's on-site coordinator/manager and other appropriate YHPC personnel on a daily basis. Passage information was subsequently provided electronically by YHPC personnel to members of the FPTAC.

2.3 Results

2.3.1 Spring Fishway Operation

2.3.1.1 Relative Abundance

The number of fish that passed through the York Haven fish ladder is presented in Table 1. During manned Fishway operation, some 2,173 fish of 11 taxa were enumerated as they passed upstream into Lake Frederic. Channel Catfish (1,264) was the dominant fish species passed and comprised over 58.2% of the fish passed. A total of 2 American Shad and 3 Blueback Herring were counted as they passed upstream through the ladder. Other predominant fishes passed included Gizzard Shad (451), Carp (258), and Smallmouth Bass (105). Passage varied daily and ranged from 456 fish on May 24 when 21.0% of the season total was passed to 45 fish on May 23.

¹ Water temperature data to be provided separately in an Excel file.

2.3.1.2 American Shad Passage

Two American Shad passed upstream through the ladder in 2022. American Shad passed upstream on May 31. American Shad were passed at a water temperature of 76.9°F, River flows of 19,300 cfs and East Channel flows of 2,750 cfs (Table 2 and Table 3, Figure 3 and Figure 4). Both American Shad passed between 1100 hrs and 1200 hrs on May 31 (Table 4).

2.3.1.3 Other Alosids

Three Blueback Herring were observed passing through the ladder, one passed on May 29 and two passed on May 30 (Table 1). No Alewife passed.

2.3.2 Resident Fishway Operation

During resident fish passage, March 29 through May 20, the entrance and exit gates were opened and the North Fixed Wheel Gate was opened and set to deliver a minimum of 400 cfs to the East Channel providing volitional passage of resident fish. Following staffed operation on June 3, resident fish passage resumed and the Fishway was reset when the South fixed wheel gate was closed, and the North fixed wheel gate and ladder was set to deliver at least 400 cfs into the East Channel. In order to eliminate spill at the Main Dam to facilitate maintenance activities being conducted on the Main Dam both fixed wheel gates were opened from 0830 hrs on September 26 to 1000 hrs on October 6. Following this 11-day period, the Fishway was reset to provide volitional passage and deliver at least 400 cfs until it was closed on December 19. From March 29 through December 19, water temperatures varied from 36.3°F to 86.2°F and River flows of 8,850 cfs to 183,000 cfs (Figure 5).

3.0 DOWNSTREAM FISH PASSAGE

Article 401 of the Project license, conditions III.B.2.b and 3.a.i and ii of the Pennsylvania Department of Environmental Protection (PADEP) Water Quality Certification, and 9.9.6 of the United States Fish and Wildlife Service (USFWS) fishway prescription require downstream passage of adult and juvenile American Shad. Downstream passage of adult American Shad is expected to occur from May 1 to June 30 while downstream passage of juvenile American Shad is to occur from October 1 through November 30. Based on a USFWS request received on January 15, 2021, the Project began collecting water temperature in the Station forebay at 60-minute intervals in 2021 with an Onset Hobo Water Temperature Pro v2 Data Logger (U22-001) that has a $\pm 0.4^{\circ}\text{F}$ accuracy. In 2022, the monitor was suspended on the west side of the forebay approximately 4 ft above the bottom behind the trash rack in the exciter pit area located on the south of Turbine Unit 1. For some unknown reason the monitor failed to download on November 14, and as a result collection of water temperature data at the Project this year was limited to data collected at the Fishway. In addition to installing a standpipe to house and protect the Data Logger the Station is planning to download the monitor every three months in 2023. Also, at the recommendation of the PA DEP, the Station will have an extra Data Logger on site to replace any malfunctioning Loggers (Appendix 1).

3.1 Adult American Shad Passage

When River flows exceed the sum of Project hydraulic capacity (17,000 cfs), and required flows through the East Channel (2,000 cfs) and required flows over the Main Dam ((4,000 cfs), (total of 23,000 cfs)), the Station, according to its FERC License and 401 Water Quality Certification, the Station is to open and spill water via the forebay Sluice Gate (~370 cfs) to the extent practicable for a period of 1 to 2 hours during the morning on weekdays, subject to Project personnel availability and access requirements for operations and maintenance purposes and may be provided in connection with opening of the forebay Sluice Gate for purposes of passing debris. During the post-spawned adult downstream passage period, river flow varied from cfs 10,800 cfs to 156,000 cfs (Figure 6). Average daily water temperature varied by 24.3 degrees at the Project (Fishway) and ranged from a low of 55.0°F on May 8 to a high low of 79.3°F on June 2.

During the adult downstream passage period, except for May 30 the Memorial Day Holiday, the sluice gate was opened as required (~370 cfs) for up to 2 hours, Monday through Friday, throughout May, when river flows exceeded a total of 23,000 cfs and requirements for operations and maintenance purposes (Figure 7). Although flows did not exceed 23,000 cfs on any weekdays in June, the sluice gate was opened on June 1, 2, 3, 6, 10, 13, 14, and 15. No physical observations of post-spawned adult American Shad were noted by Station personnel.

3.2 Juvenile American Shad Passage

During the Juvenile American Shad Passage Period (JASPP), October 1 to November 30, YHPC operates the turbines as follows. Depending on available River flow, Units 1-6 (Propeller/Kaplan units) may be operated without restriction up to available River flow. Unit 14 (larger single Francis unit) may be operated if river flow exceeds capacity of Units 1 to 6; Units 7 to 13 and 15 to 20 (double Francis units) may be operated in ascending order if river flow exceeds capacity of Units 1-6 and 14. During the downstream juvenile passage period, the Station is to also open and spill water via the Forebay Sluice Gate (~370 cfs) between the hours of 5 PM to 11 PM EST. If during the downstream passage period, River flow exceeds the sum

of Project hydraulic capacity, required flows through the East Channel and required flows over the Main Dam (if any), the Project is also to open and spill water via the forebay sluice gate to the extent practicable for 1 to 2 hours during the morning, subject to Project access requirements for operations and maintenance purposes.

During the JASPP, river flow varied from 7,290 cfs to 87,500 cfs (Figure 8) and was less than the hydraulic capacity (17,000 cfs) of the Station on 40 days: October 1 to 5 and October 10 to November 12. In contrast, 22-year average flow values (2000 to 2022) always exceeded the hydraulic capacity of the station and varied from 49,911 cfs to 17,919 cfs. Average daily water temperature at the Project (Fishway) during the JASPP varied by almost 30 degrees and ranged from a high of 68.3°F on October 16 to a low of 38.4°F on November 30. Excluding discrete periods of operation during turbine survival testing at Unit 18 on November 1, 2 and 14, Station generation data² for October and November, provided in Appendix III, confirm that Turbine Unit operation followed the JASPP operating guidelines. In accordance with the Projects FERC License and 401 Water Quality Certification, the Sluice Gate was generally opened for 14.5 to 24 hrs daily from October 1 to November 30 to provide downstream passage of juvenile shad (Figure 9). Generally, the Sluice Gate was closed from 0700 hrs to 1400 hrs during the week and the Gate was left open from 1400 hrs of Friday until 0700 hrs on Monday.

² Station generation data to be provided separately in Excel file.

4.0 LITERATURE CITED

Commonwealth of Pennsylvania Department of Environmental Protection. August 19, 2014, Water Quality Certification for the York Haven Hydroelectric Project and Related Mitigation, DEP File No. –EA67-023: York Haven Power Company, LLC, 65 pp.

Federal Energy Regulatory Commission, December 15, 2015. Order Issuing New License for York Haven Power Company, LLC. 135 pp.

Kleinschmidt. 2000. Summary of operation at the York Haven Fishway in 2000. Prepared for York Haven Power Company, GPU Energy by Kleinschmidt, Strasburg, Pennsylvania. 21 pp.

Kleinschmidt. 2002. Summary of operation at the York Haven Fishway in 2001. Prepared for York Haven Power Company, GPU Energy/FirstEnergy by Kleinschmidt, Strasburg, Pennsylvania. 21 pp.

York Haven Power Company, LLC and Kleinschmidt. April 2019. Fishway Operation Plan. Prepared for York Haven Hydroelectric Project, York Haven, Pennsylvania. 128 pp.

TABLES

Table 1. Summary of the Daily Number of Fish that Passed by the York Haven Hydroelectric Project through the Serpentine Vertical Notch Ladder at the East Channel Dam in 2022

Date	22-May	23-May*	24-May	25-May	26-May	27-May	28-May	29-May	30-May	31-May	1-Jun	2-Jun	3-Jun	Total
Observation Time (hrs.)	8.0	2.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	98
Water Temperature (°F)	73.2	73.2	69.9	68.6	68.1	68.4	69.1	71.1	73.5	76.9	78.9	79.3	77.2	-
American Shad	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Alewife	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blueback Herring	0	0	0	0	0	0	0	1	2	0	0	0	0	3
Gizzard Shad	9	3	46	109	42	9	16	15	29	35	33	70	35	451
Hickory Shad	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Striped Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White Perch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American Eel	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brown Trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Muskellunge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carp	30	7	68	14	21	1	8	32	16	13	12	18	18	258
Quillback	11	2	5	9	5	3	0	1	1	1	1	3	0	42
White Sucker	6	0	4	0	0	0	1	0	0	0	1	0	0	12
Shorthead Redhorse	0	0	0	0	2	1	0	0	0	4	1	0	0	8
White Catfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Bullhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brown Bullhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Channel Catfish	106	33	327	48	41	33	20	45	66	115	125	235	70	1,264
Rock Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redbreast Sunfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smallmouth Bass	3	0	4	2	10	0	5	22	5	33	15	3	3	105
Walleye	1	0	0	1	1	0	1	0	0	0	1	0	0	5
River Chub	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Hog Sucker	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flathead Catfish	0	0	2	2	5	1	0	1	2	2	2	2	4	23
Total	166	45	456	185	127	48	51	117	121	205	191	331	130	2,173

* Contractor used air lance to seat entrance gate 100% in pocket.

Table 2. Summary of Daily Average River Flow (USGS, Harrisburg Gage), Average Flow in the East Channel, Sum of Average Flow from the Power Station and Main Dam, Water Temperature, Secchi, Stop Gate Position, and East Channel and Fishway Water Elevations during Operation of the York Haven Fishway in 2022

Date	American Shad Passage	River Flow (cfs)	East Channel Flow (cfs)	Main Channel Flow (cfs)	Water Temp. (°F)	Secchi (in)			Stop Log Gate	Elevation (ft)					
						Avg.	Min.	Max.		Head Pond			Tailwater		
										Avg.	Min.	Max.	Avg	Min.	Max.
22-May	0	35,000	2,975	32,025	73.2	12	12	12	Closed	279.3	279.3	279.3	273.8	273.8	273.8
23-May	0	33,000	3,200	29,800	73.2	12	12	12	Closed	279.4	279.4	279.4	274.4	274.4	274.4
24-May	0	29,600	3,800	25,800	69.9	15	12	16	Closed	279.5	279.5	279.5	274.4	274.4	274.4
25-May	0	27,200	4,000	23,200	68.6	15	14	15	Closed	279.6	279.6	279.6	274.4	274.4	274.4
26-May	0	24,700	2,975	21,725	68.1	16	16	16	Closed	279.3	279.3	279.3	274.9	274.9	274.9
27-May	0	23,000	4,000	19,000	68.4	12	11	13	Closed	279.6	279.6	279.6	274.9	274.9	274.9
28-May	0	22,800	2,975	19,825	69.1	13	11	14	Closed	279.3	279.3	279.3	274.9	274.9	274.9
29-May	0	21,600	2,975	18,625	71.1	15	15	15	Closed	279.3	279.3	279.3	274.9	274.9	274.9
30-May	0	20,700	2,750	17,950	73.5	11	11	11	Closed	279.2	279.1	279.3	273.5	273.5	273.5
31-May	2	19,300	2,750	16,550	76.9	13	12	15	Closed	279.2	279.1	279.3	273.5	273.5	273.5
1-Jun	0	17,800	2,750	15,050	78.9	20	20	20	Closed	279.2	279.1	279.3	273.5	273.5	273.5
2-Jun	0	17,300	2,500	14,800	79.3	11	11	12	Closed	279.1	279.1	279.1	273.4	273.4	273.5
3-Jun	0	17,300	2,500	14,800	77.2	12	11	12	Closed	279.1	279.1	279.1	273.5	273.5	273.5

Table 3. Summary of Surface Water Elevations Recorded during Operation of the York Haven Fishway in 2022

Date	River Flow (cfs)	Elevation (ft)																				
		<u>Head Pond</u>			<u>Tailwater</u>			<u>Inside Fishway</u>			<u>Inside Weir</u>			<u>Above Counting Room</u>			<u>Below Fixed Wheel Gate</u>			<u>Counting Room</u>		
		Avg.	Min.	Max.	Avg	Min.	Max.	Avg	Min.	Max.	Avg	Min.	Max.	Avg	Min.	Max.	Avg	Min.	Max.	Avg	Min.	Max.
22-May	32,025	279.3	279.3	279.3	273.8	273.8	273.8	274.4	274.4	274.4	277.5	277.4	277.5	279.0	279.0	279.0	277.3	277.3	277.3	278.9	278.8	278.9
23-May	29,800	279.4	279.4	279.4	274.4	274.4	274.4	275.0	275.0	275.0	277.6	277.5	277.6	279.0	279.0	279.0	277.4	277.4	277.4	278.9	278.8	278.9
24-May	25,800	279.5	279.5	279.5	274.4	274.4	274.4	275.0	275.0	275.0	277.7	277.6	277.7	278.9	278.9	278.9	277.4	277.4	277.4	278.8	278.8	278.9
25-May	23,200	279.6	279.6	279.6	274.4	274.4	274.4	275.0	275.0	275.0	277.6	277.6	277.6	278.8	278.8	278.8	277.5	277.4	277.5	278.7	278.6	278.7
26-May	21,725	279.3	279.3	279.3	274.9	274.9	274.9	275.5	275.5	275.5	277.7	277.7	277.7	278.7	278.7	278.7	277.5	277.5	277.5	278.6	278.5	278.6
27-May	19,000	279.6	279.6	279.6	274.9	274.9	274.9	275.5	275.5	275.5	277.5	277.5	277.5	278.7	278.7	278.7	277.5	277.5	277.5	278.4	278.4	278.5
28-May	19,825	279.3	279.3	279.3	274.9	274.9	274.9	275.5	275.5	275.5	277.6	277.6	277.7	278.7	278.7	278.7	277.5	277.5	277.5	278.5	278.5	278.5
29-May	18,625	279.3	279.3	279.3	274.9	274.9	274.9	275.5	275.5	275.5	277.5	277.5	277.5	278.7	278.7	278.7	277.5	277.5	277.5	278.5	278.5	278.5
30-May	17,950	279.2	279.1	279.3	273.5	273.5	273.5	274.0	274.0	274.0	277.5	277.5	277.5	278.7	278.7	278.7	277.4	277.4	277.4	278.5	278.5	278.6
31-May	16,550	279.2	279.1	279.3	273.5	273.5	273.5	274.0	274.0	274.0	277.5	277.5	277.5	278.6	278.6	278.6	277.4	277.4	277.4	278.5	278.5	278.6
1-Jun	15,050	279.2	279.1	279.3	273.5	273.5	273.5	274.1	274.1	274.1	277.4	277.4	277.4	278.6	278.6	278.6	277.5	277.5	277.5	278.5	278.5	278.5
2-Jun	14,800	279.1	279.1	279.1	273.4	273.4	273.5	274.0	274.0	274.0	277.4	277.4	277.5	278.6	278.6	278.6	277.4	277.4	277.4	278.5	278.5	278.5
3-Jun	14,800	279.1	279.1	279.1	273.5	273.5	273.5	274.0	274.0	274.0	277.4	277.4	277.4	278.6	278.6	278.6	277.4	277.4	277.4	278.5	278.5	278.5

Table 4. Hourly Summary of American Shad Passage through the Vertical Notch Fish Ladder at the York Haven Hydroelectric Project in 2022

Date	22-May	23-May	24-May	25-May	26-May	27-May	28-May	29-May	30-May	31-May	1-Jun	2-Jun	3-Jun	Total	%
Observation Time (Start)	0800	1400	0800	0800	0800	0800	0800	0800	0800	0800	0800	0800	0800		
Observation Time (End)	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600		
Military Time (Hours)															
0800 - 0859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
0900 - 0959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1000 - 1059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1100 - 1159	0	0	0	0	0	0	0	0	0	2	0	0	0	2	100.0%
1200 - 1259	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1300 - 1359	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1400 - 1459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1500 - 1559	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total Catch	0	0	0	0	0	0	0	0	0	2	0	0	0	2	100.0%

FIGURES

Figure 1. General Layout of the York Haven Hydroelectric Project Showing the Location of the Fishway

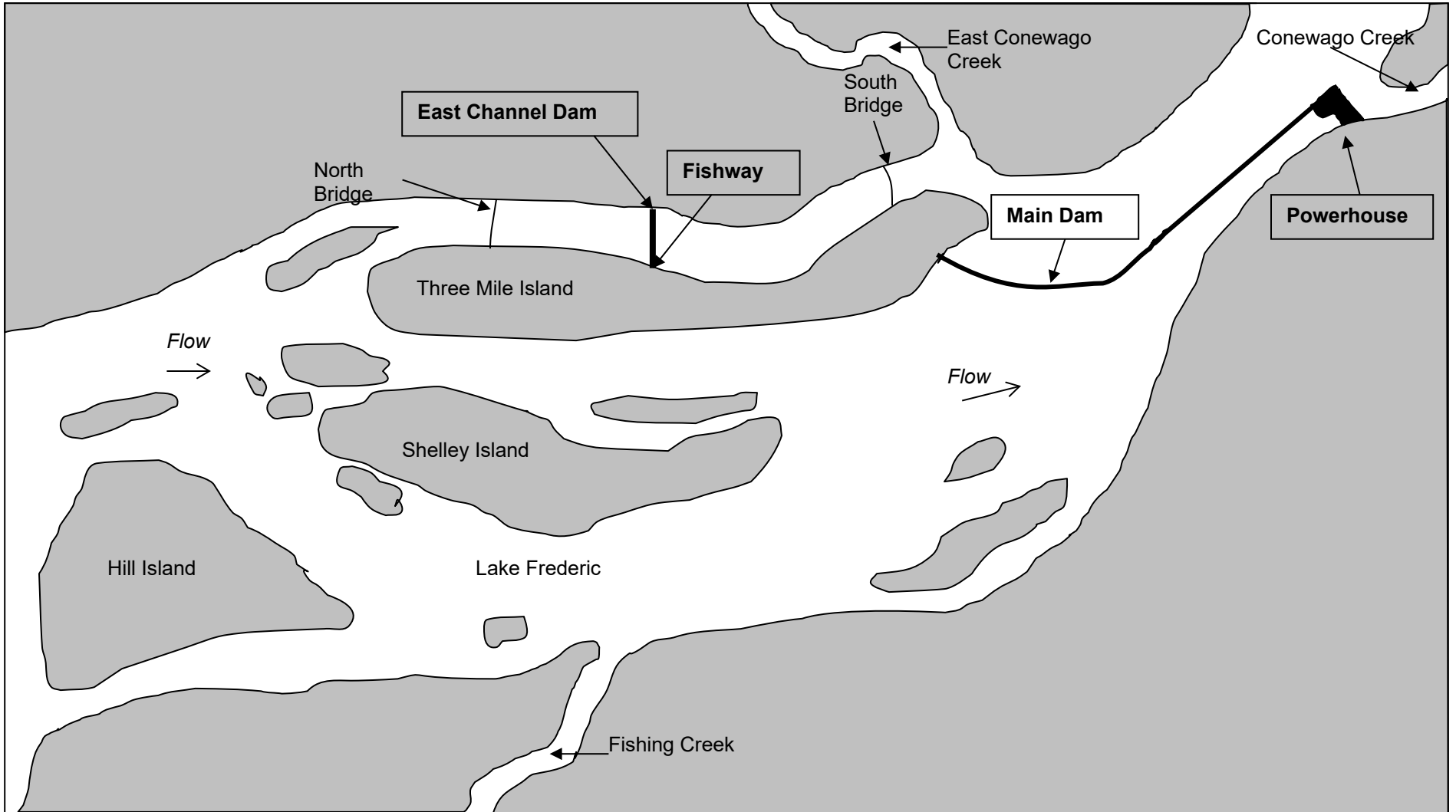


Figure 2. General Arrangement - York Haven Fishway

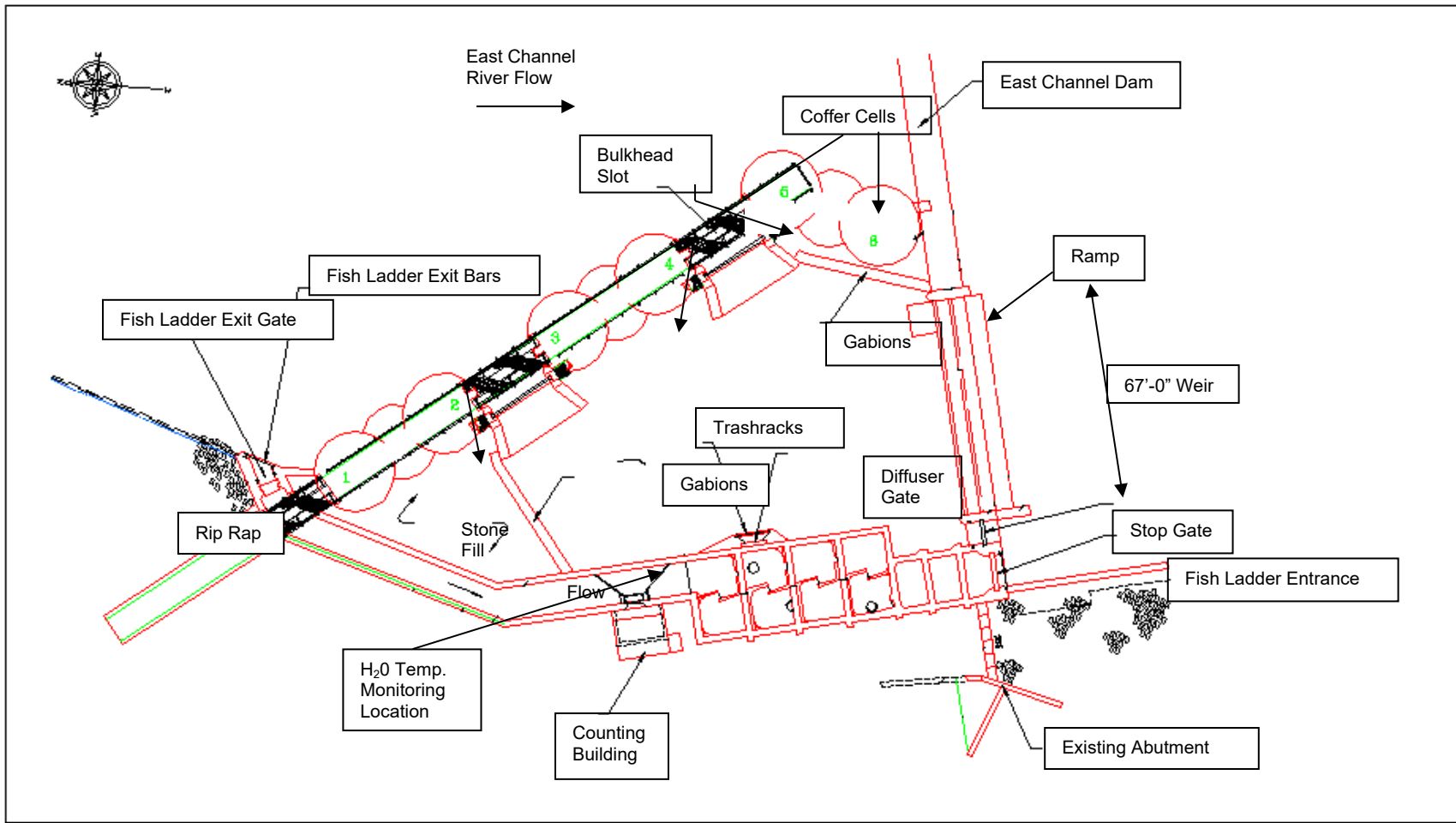


Figure 3. Plot of River Flow (x 1000 cfs) at the USGS Harrisburg Station (01570500) and Average Daily Water Temperature (F) at the York Haven East Channel Fishway in Spring 2022 and 22-Year Average Flow Values (2000-2021)

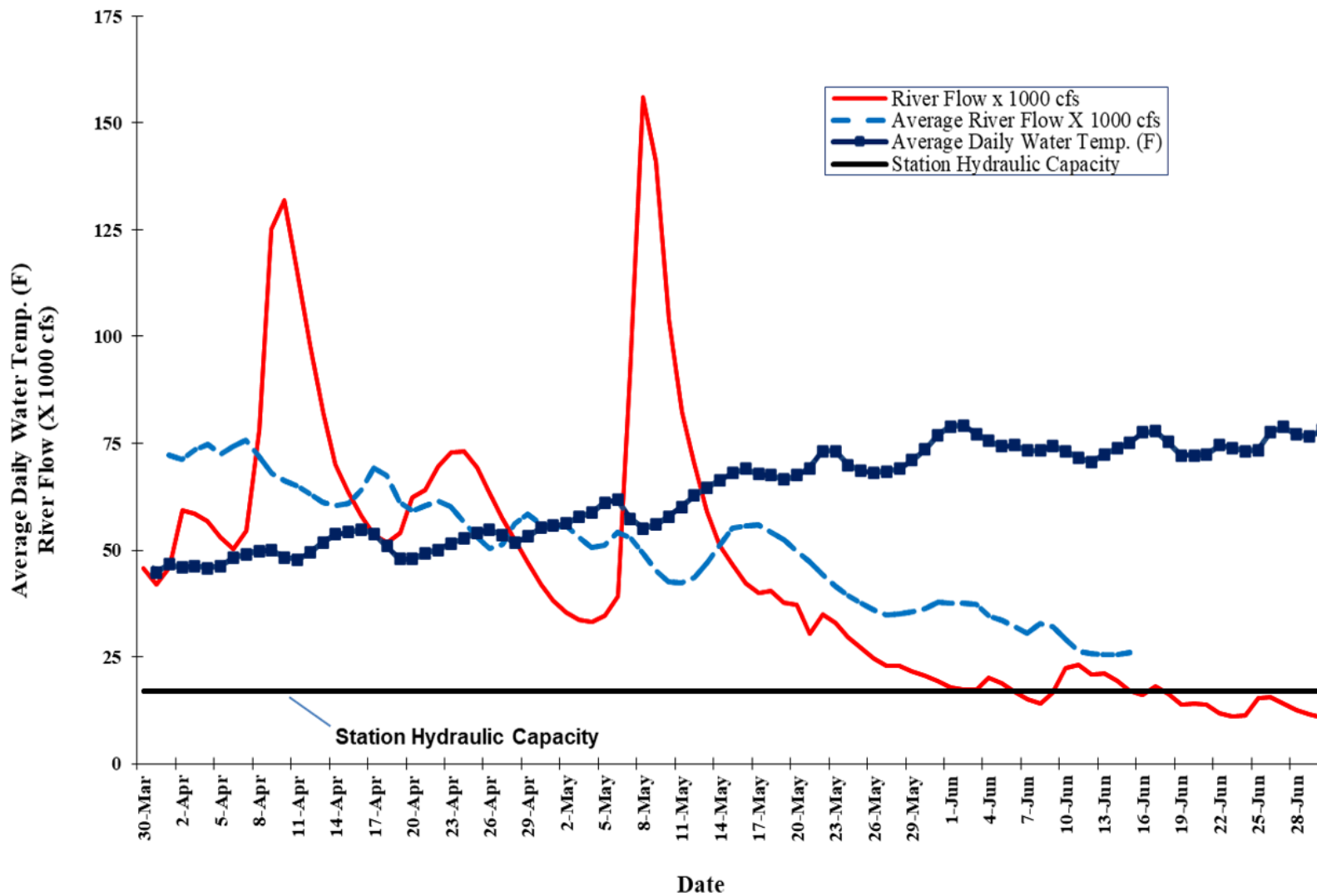


Figure 4. Plot of River Flow (x 1000 cfs) and East Channel Flow (x 1000 cfs) in Relation to the Daily American Shad Passage at the York Haven Fishway in Spring 2022

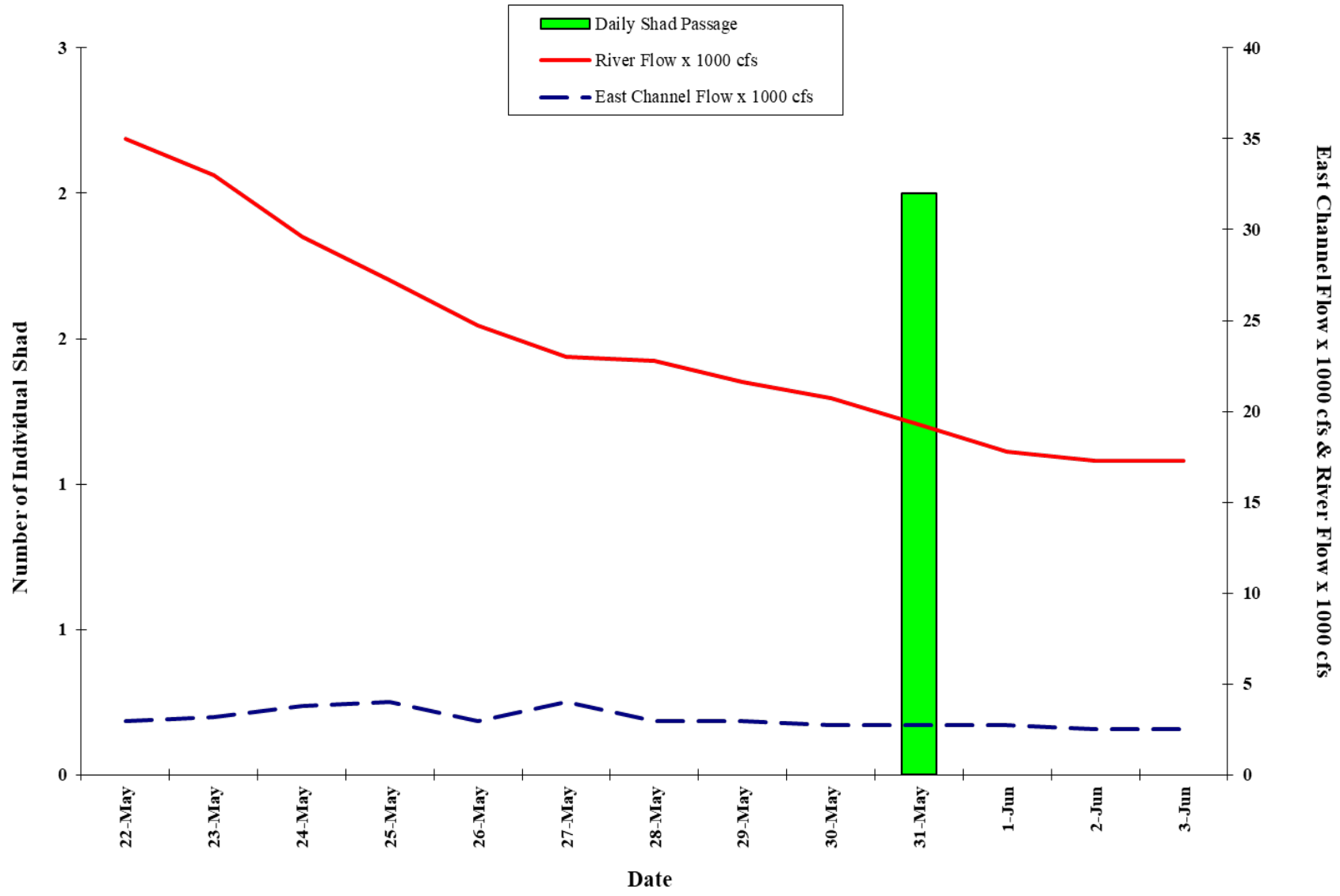


Figure 5. Plot of River Flow (cfs) at the USGS Harrisburg Station (#01570500) and Average Daily Water Temperature (F) at the York Haven East Channel Fishway, March 30 to December 19, 2022

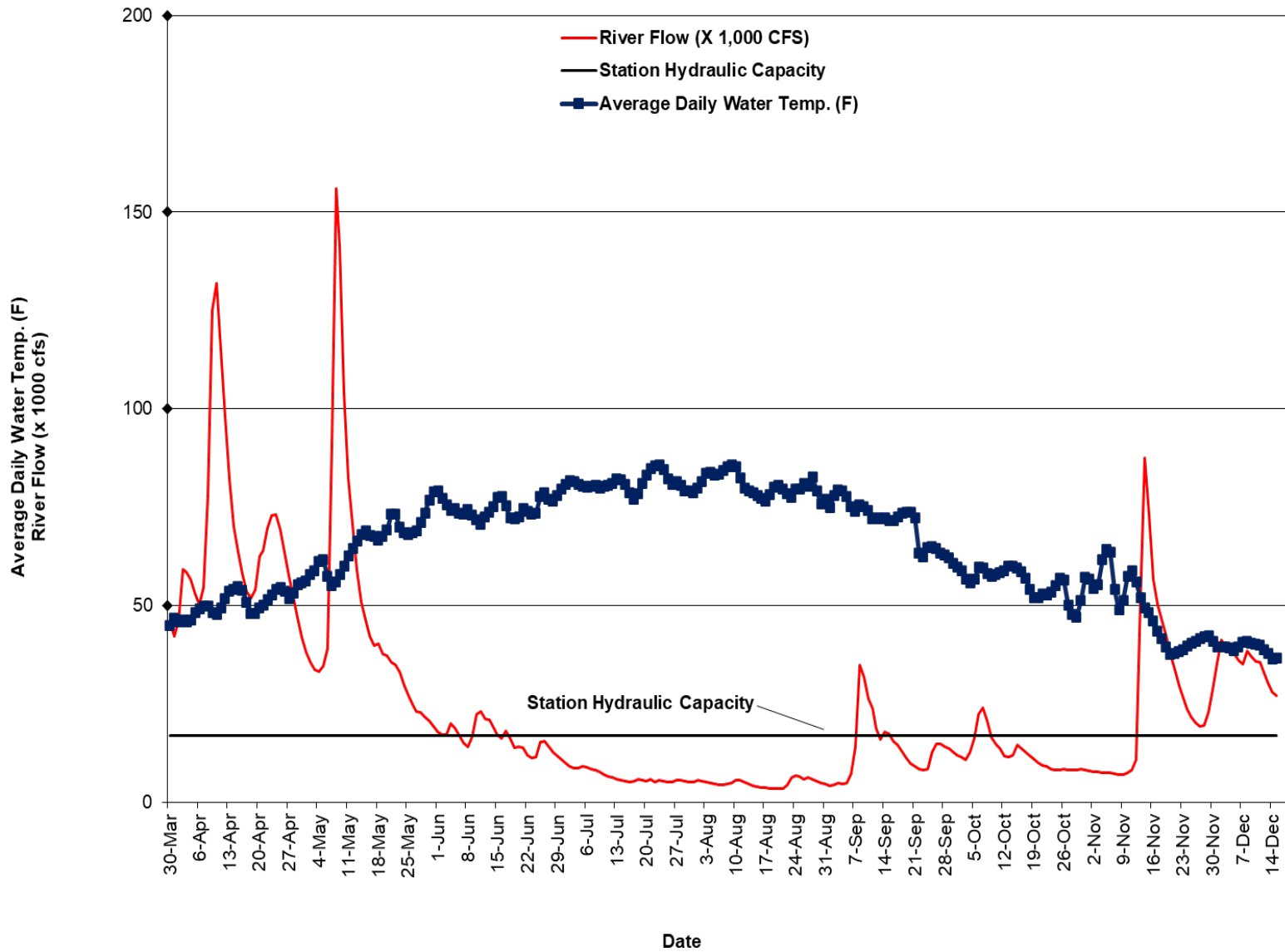


Figure 6. Plot of River Flow (cfs) at the USGS Station (#01570500) and Average Daily Water Temperature (F) in the Headrace of the York Haven Power Station, May 1 to June 30, 2022

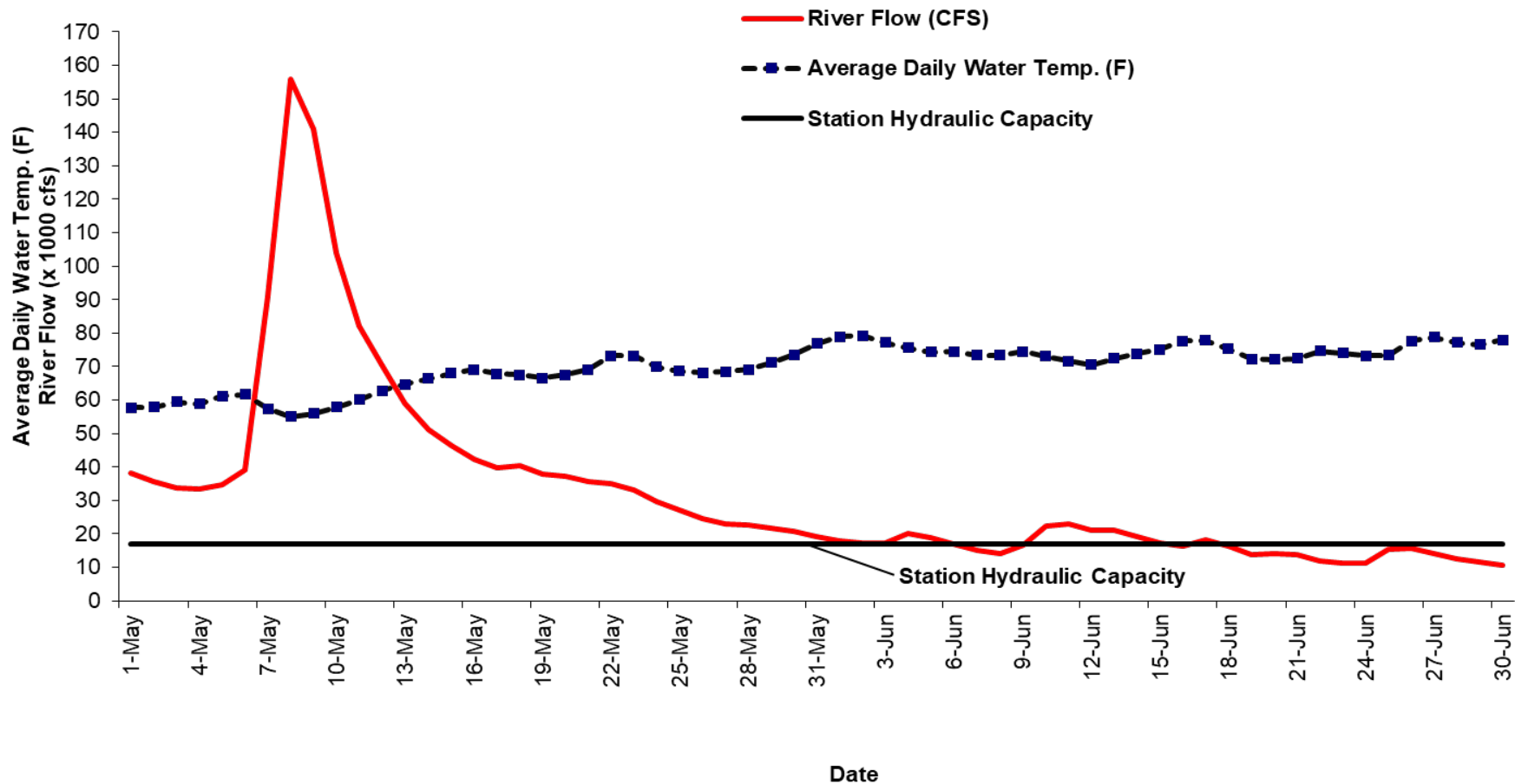


Figure 7. York Haven Sluice Gate Operation, May 1 to June 30, 2022

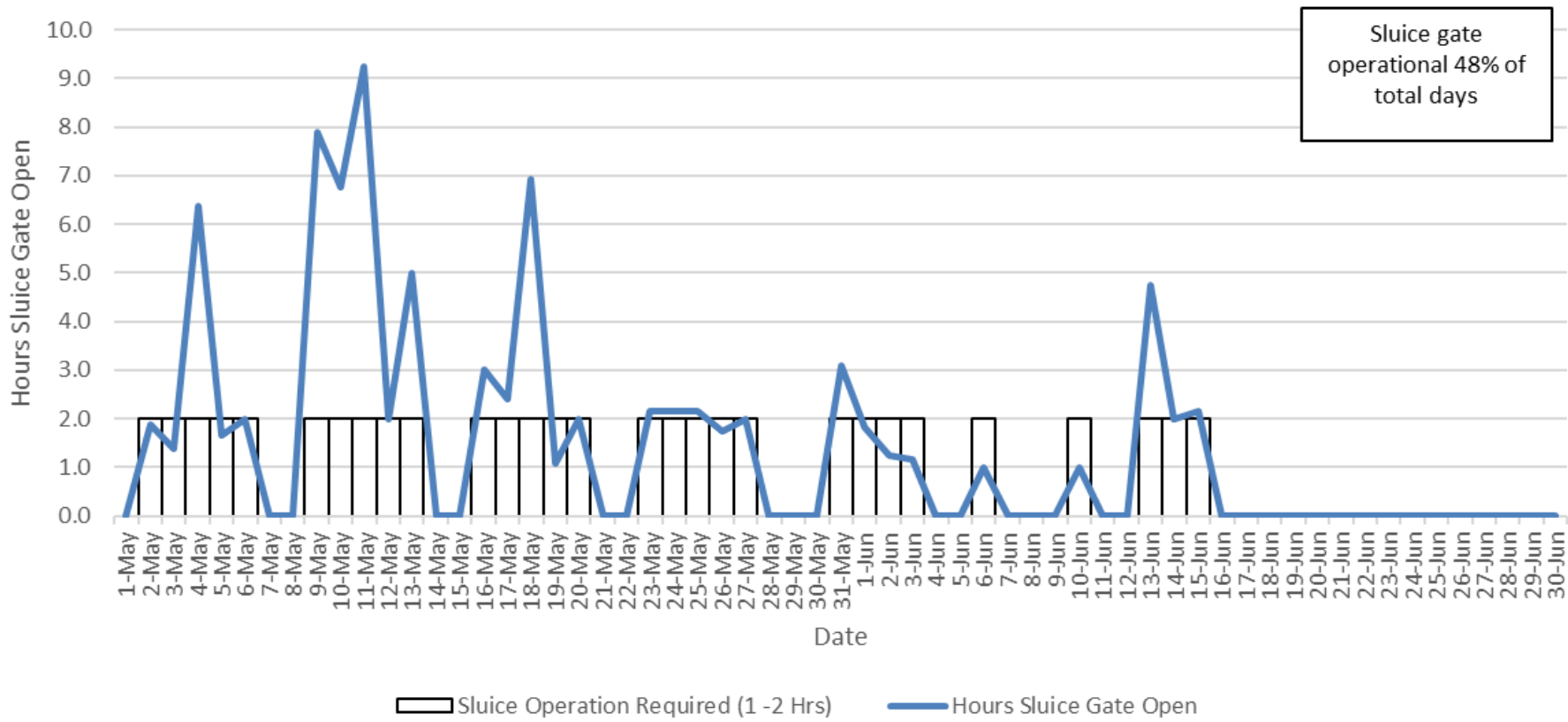


Figure 8. Plot of River Flow (cfs) at the USGS Harrisburg Station (#01570500) and Average Daily Water Temperature (F) at the York Haven East Channel Fishway, October 1 to November 30, 2022 and 22-year Average Flow Values (2000-2021)

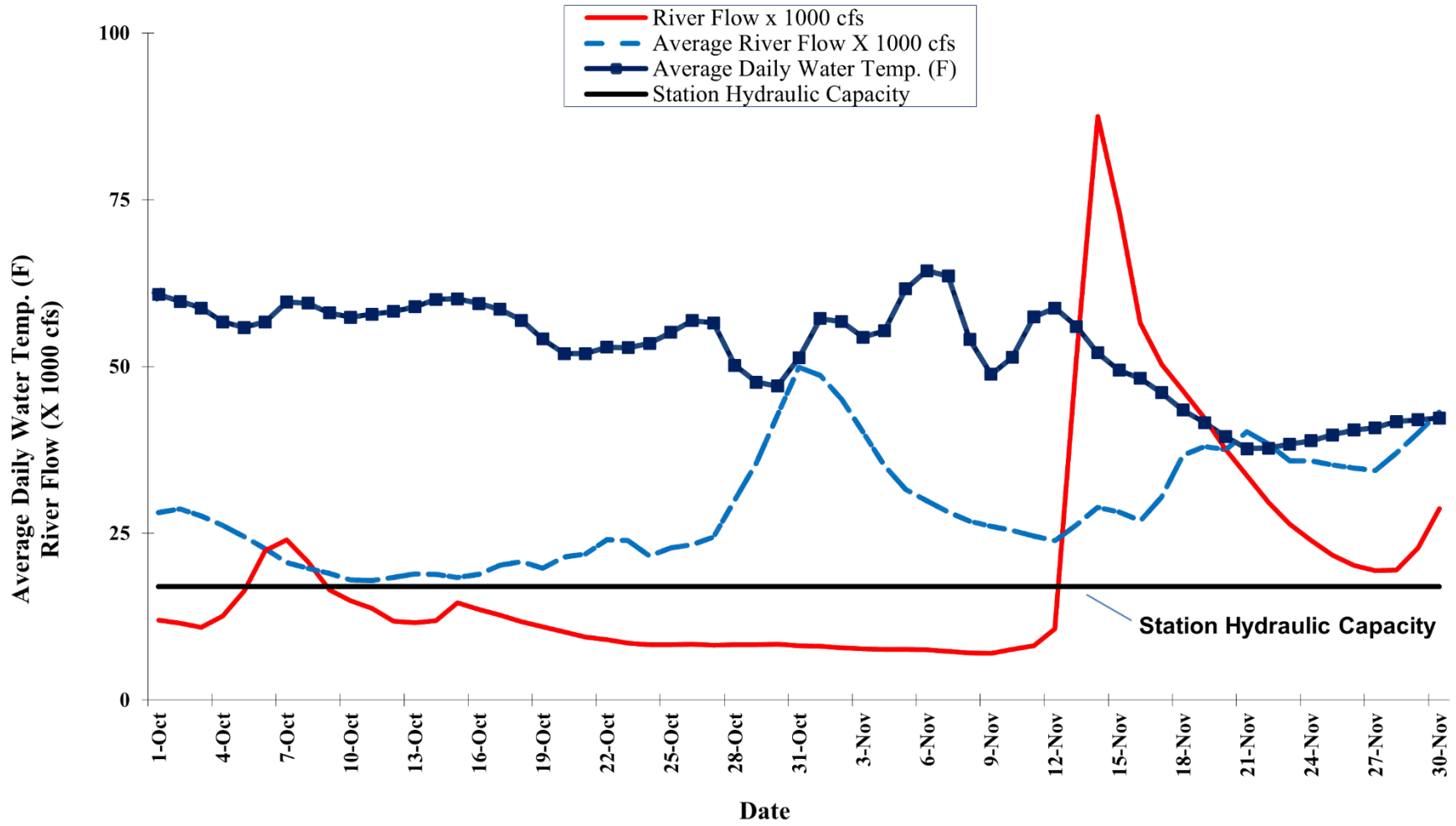
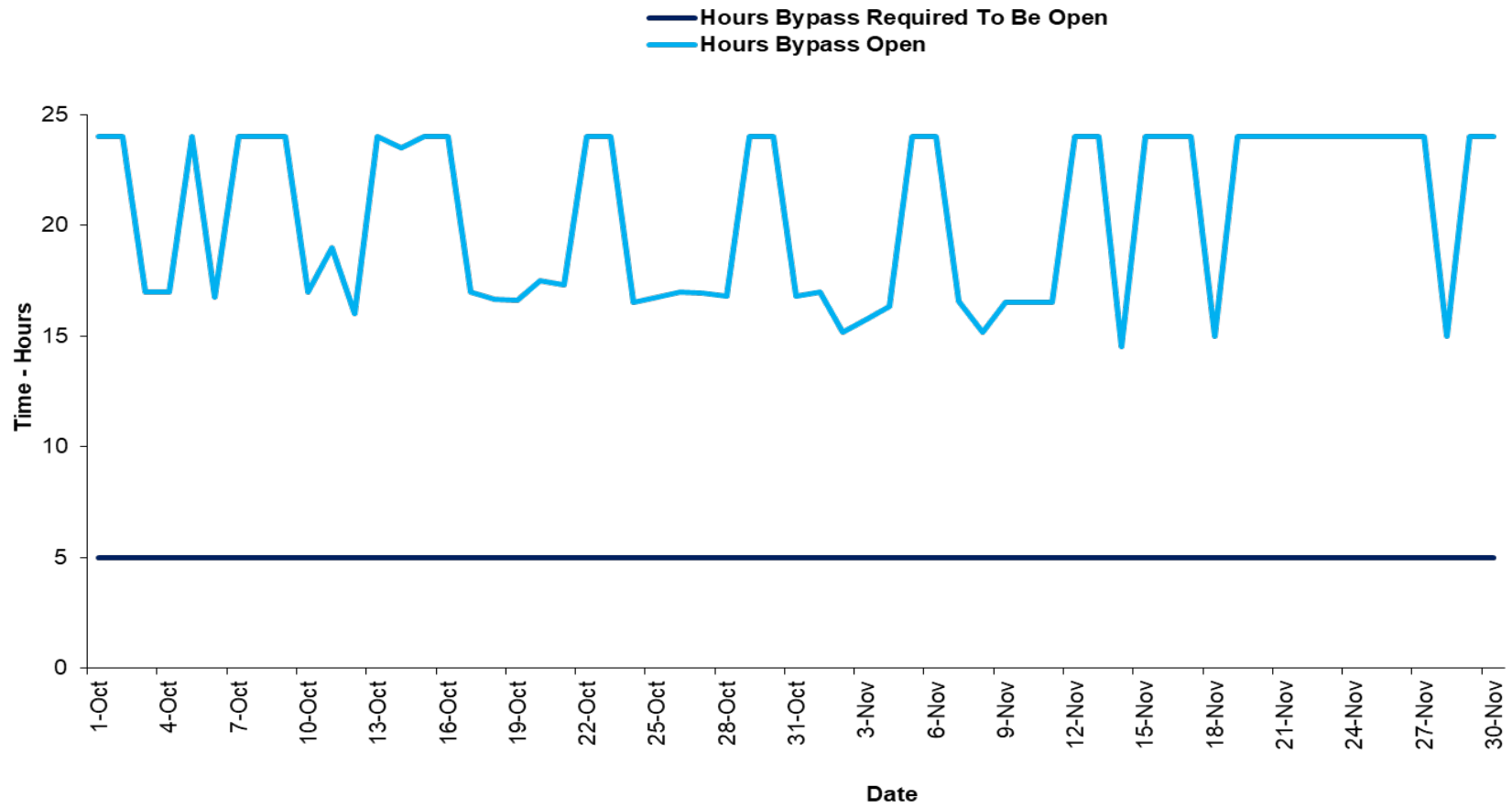


Figure 9. York Haven Sluice Gate Operation, October 1 to November 30, 2022



APPENDIX I

Consultation Record

From: Shawn Seaman -DNR- <shawn.seaman@maryland.gov>

Sent: Wednesday, February 1, 2023 9:01 AM

To: Eberts, Ron <reberts@pa.gov>

Cc: Jody Smet <Jody.Smet@eaglecreekre.com>; Sheila Eyler <Sheila_Eyler@fws.gov>; Morales, Jesus <jesus_morales@fws.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Kenneth Hogan-USFWS <kenneth_hogan@fws.gov>; Williamson, Scott <scwilliams@pa.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Niewinski, Brian <bniewinski@pa.gov>; Tom O'Connor <Tom.OConnor@eaglecreekre.com>; Matthew Pyle <Matthew.Pyle@eaglecreekre.com>; Joyce Foster <joyce.foster@eaglecreekre.com>; Benjamin Lenz <benjamin.lenz@eaglecreekre.com>



Subject: Re: [External] York Haven Hydro Project (FERC No. 1888) - 2022 Fishway Operating Plan (FOP) Annual Report *DRAFT*

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Jody,

We reviewed the documents and do not have any substantial concerns. However, we did observe a few minor syntactic errors that we wanted to share with you for your consideration.

- Executive summary Paragraph 3: Hours when counting occurred on May 23 is not stated. Per Table 4, I am assuming this should read ". . .on May 23, between 1400 and 1600, because the entrance gate . . . " per Table 4.
- Section 2.2.3 Paragraph 2: Hours when counting occurred on May 23 is not stated. Per Table 4, I am assuming this should read ". . .on May 23, between 1400 and 1600, because the entrance gate . . . " per Table 4.
- Section 2.2.4 Paragraph 1: Assuming this was intended to read ". . . to remove debris from screens at the fishway exit and to conduct other activities"
- Section 3.1 Paragraph 1: Assuming this was to read ". . . (total of 23,000 cfs)), the Station, according to its FERC License and 401 Water Quality Certification, is to open and spill . . ."

 <p>CHANGING Maryland <i>for the Better</i></p>  <p>dnr.maryland.gov</p>	<p>Shawn A Seaman Power Plant Siting Assessor II <i>Power Plant Research Program</i> <i>Department of Natural Resources</i> Tawes State Office Building 580 Taylor Ave., B-3 Annapolis, MD 21401 410-260-8662 (office) 443-699-6386 (cell) shawn.seaman@maryland.gov</p> <p>Power Plant Research Program Website</p>
---	---

[Click here](#) to complete a three question customer experience survey.

On Wed, Jan 18, 2023 at 10:40 AM Eberts, Ron <reberts@pa.gov> wrote:
Jody,

PA DEP has reviewed the attached 2022 York Haven Fish Passage DRAFT Report and offer the following comment.

1. Section 3.0 Downstream Fish Passage- Due to the malfunction of the Onset HOBO Temp Pro v2 Data Logger in the Forebay, YHPC plans to download every 3 months in 2023. PA DEP recommends YHPC have an extra Temp Logger onsite to replace any malfunctioning Loggers.

Thank you for the opportunity to comment.

Regards,

Ronald C. Eberts, Jr. | Environmental Protection Compliance Specialist
Department of Environmental Protection
Southcentral Regional Office
Waterways & Wetlands Program
909 Elmerton Avenue | Harrisburg, PA 17110
Phone: 717.705.4819 | Fax: 717.705.4760
THE SOUTHCENTRAL REGIONAL OFFICE AFTER HOURS REPORTING & 24 HOUR EMERGENCY RESPONSE
NUMBER: 1-800-541-2050.

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From: [Benjamin Lenz](#)
To: [Eyler, Sheila](#); [Jody Smet](#); [Morales, Jesus J](#); [McCorkle, Richard](#); [Hogan, Kenneth J](#); [Williamson, Scott](#); [Eberts, Ron](#); [Shawn Seaman -DNR](#); [Aaron Henning](#); [Miller, Jeremy](#); [Brian Niewinski](#)
Cc: [Tom O'Connor](#); [Matthew Pyle](#); [Joyce Foster](#); [Chris Frese](#)
Subject: RE: [EXTERNAL] York Haven Hydro Project (FERC No. 1888) - 2022 Fishway Operating Plan (FOP) Annual Report *DRAFT*
Date: Friday, January 27, 2023 1:09:00 PM
Attachments: [October 2022 Generation Data.pdf](#)
[image002.png](#)

Greetings: Attached is the complete generation dataset at York Haven for the month of October 2022.

Ben E. Lenz | Licensing and Compliance Manager
Eagle Creek Renewable Energy

Mobile: 203 240 3664

Email: benjamin.lenz@eaglecreekre.com



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From: Eyler, Sheila <sheila_eyler@fws.gov>
Sent: Tuesday, January 17, 2023 7:56 AM
To: Jody Smet <Jody.Smet@eaglecreekre.com>; Morales, Jesus J <jesus_morales@fws.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Hogan, Kenneth J <kenneth_hogan@fws.gov>; Williamson, Scott <scwilliams@pa.gov>; Eberts, Ron <reberts@pa.gov>; Shawn Seaman -DNR <shawn.seaman@maryland.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Brian Niewinski <bniewinski@pa.gov>
Cc: Tom O'Connor <Tom.OConnor@eaglecreekre.com>; Matthew Pyle <Matthew.Pyle@eaglecreekre.com>; Joyce Foster <joyce.foster@eaglecreekre.com>; Benjamin Lenz <benjamin.lenz@eaglecreekre.com>
Subject: Re: [EXTERNAL] York Haven Hydro Project (FERC No. 1888) - 2022 Fishway Operating Plan (FOP) Annual Report *DRAFT*

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Jody,

Thank you for the opportunity to review the York Haven Hydro Project's 2022 Fishway Operating Plan Annual Report. The Service has no comments on the report. We look forward to receiving the associated data for the report in an electronic format once it is finalized.

Sheila Eyler
U.S. Fish and Wildlife Service
Mid-Atlantic Fish & Wildlife Conservation Office
717-387-2117

From: Jody Smet <Jody.Smet@eaglecreekre.com>
Sent: Friday, December 30, 2022 1:54 PM
To: Eyler, Sheila <sheila_eyler@fws.gov>; Morales, Jesus J <jesus_morales@fws.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Hogan, Kenneth J <kenneth_hogan@fws.gov>; Williamson, Scott <scwilliams@pa.gov>; Eberts, Ron <reberts@pa.gov>; Shawn Seaman -DNR- <shawn.seaman@maryland.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Brian Niewinski <bniewinski@pa.gov>
Cc: Tom O'Connor <Tom.OConnor@eaglecreekre.com>; Matthew Pyle <Matthew.Pyle@eaglecreekre.com>; Joyce Foster <joyce.foster@eaglecreekre.com>; Benjamin Lenz <benjamin.lenz@eaglecreekre.com>
Subject: [EXTERNAL] York Haven Hydro Project (FERC No. 1888) - 2022 Fishway Operating Plan (FOP) Annual Report *DRAFT*

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Agencies –

I have attached a draft of the York Haven FOP 2022 annual report for your review and comment. Please note: the October 2022 generation data will be updated and provided electronically early next week (generation data from 0059 hrs. on 1 October through 1359 hrs. on 3 October is not currently included in the attached).

Please submit written comments on the draft report NLT January 31, 2023. YHPC will schedule a meeting in January 2023 with the Agencies as required by the Project license – look for a Doodle poll next week.

Thank you and Happy New Year!

Jody J. Smet, AICP | Senior Vice President Engineering and Regulatory Affairs
Eagle Creek Renewable Energy

7315 Wisconsin Ave | Suite 1100W | Bethesda MD 20814
Mobile: 804 382 1764

Email: jody.smet@eaglecreekre.com

Pronouns: she/her



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From: [Jody Smet](#)
To: [Eyler, Sheila](#); [Chris Frese](#); [Tom O'Connor](#); [Josh Tryniewski](#); [Aaron Henning](#); [Miller, Jeremy](#); [Ron Eberts](#); [McCorkle, Richard](#); [Zollweg-Horan, Emily C \(DEC\)](#); [shawn.seaman@maryland.gov](#); [andrea.danucalov@constellation.com](#); [Jesus Morales](#)
Cc: [Joyce Foster](#); [Benjamin Lenz](#)
Subject: RE: [EXTERNAL] York Haven (FERC No. 1888) - ECF Manned Operations
Date: Friday, June 3, 2022 11:23:50 AM

Thank you all for getting back to us so quickly.

Happy Friday,

Jody J. Smet, AICP
Senior Vice President Engineering and Regulatory Affairs
Eagle Creek Renewable Energy

From: Eyler, Sheila <sheila_eyler@fws.gov>
Sent: Friday, June 3, 2022 7:08 AM
To: Jody Smet <Jody.Smet@eaglecreekre.com>; Chris Frese <Chris.Frese@KleinschmidtGroup.com>; Tom O'Connor <Tom.OConnor@eaglecreekre.com>; Tryniewski, Joshua <jtryniewski@pa.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Ron Eberts <reberts@pa.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Zollweg-Horan, Emily C (DEC) <emily.zollweg-horan@dec.ny.gov>; shawn.seaman@maryland.gov; andrea.danucalov@constellation.com; Morales, Jesus J <jesus_morales@fws.gov>
Cc: Joyce Foster <joyce.foster@eaglecreekre.com>; Benjamin Lenz <benjamin.lenz@eaglecreekre.com>
Subject: Re: [EXTERNAL] York Haven (FERC No. 1888) - ECF Manned Operations

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Jody,

I've conferred with PFBC, NYSDEC, and PADEP and we have no objections to your plan to end manned operations at the ECF at the end of the day today. Thank you for conducting observations at the ECF this spring after 500 shad were stocked downstream of the project.

Sheila Eyler
U.S. Fish and Wildlife Service
Mid-Atlantic Fish & Wildlife Conservation Office
717-387-2117

From: Jody Smet <Jody.Smet@eaglecreekre.com>
Sent: Thursday, June 2, 2022 1:25 PM
To: Eyler, Sheila <sheila_eyler@fws.gov>; Chris Frese <Chris.Frese@KleinschmidtGroup.com>; Tom O'Connor <Tom.OConnor@eaglecreekre.com>; Tryniewski, Joshua <jtryniewski@pa.gov>; Aaron Henning <ahenning@srbc.net>; Miller, Jeremy <jeremmille@pa.gov>; Ron Eberts <reberts@pa.gov>; McCorkle, Richard <richard_mccorkle@fws.gov>; Zollweg-Horan, Emily C (DEC)

<emily.zollweg-horan@dec.ny.gov>; shawn.seaman@maryland.gov
<shawn.seaman@maryland.gov>; andrea.danucalov@constellation.com
<andrea.danucalov@constellation.com>; Morales, Jesus J <jesus_morales@fws.gov>
Cc: Joyce Foster <joyce.foster@eaglecreekre.com>; Benjamin Lenz
<benjamin.lenz@eaglecreekre.com>
Subject: [EXTERNAL] York Haven (FERC No. 1888) - ECF Manned Operations

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Good Afternoon,

Since Conowingo ended the upstream trap and transport of American Shad and River Herring yesterday, YHPC is proposing to stop counting fish at the end of the end of the day on Friday afternoon (June 3, 2022). Below is a summary of information used to develop YHPC's rationale/plan to stop counting fish Friday afternoon at the ECF.

Water temperature was 77.8F yesterday, only 2 American Shad have passed the ECF since counting began on 22 May, and the last transport/release of shad occurred on May 29 (6 days prior to June 3). Furthermore, in past years YHPC would not have started counting fish until 4 days after 1,000 American Shad had passed Safe Harbor so counting would not have been required (only 797 American Shad were released Downstream of YH at Columbia in 2022 and 188 shad were stocked at Columbia prior to high flow event (156,000 cfs) on May 8).

Based on the above information we would like your support/approval to stop counting fish at the ECF Friday afternoon at 4pm and set the ECF to again provide resident fish.

Please let me know if you have any questions and/or concerns.

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APPENDIX II

Fishway Water Temperature (°F) - 31 March through 19 December 2022

ECF Average Daily Water Temperature, 31 March to 19 December 2022

31-Mar	44.8	14-May	66.4	27-Jun	78.8
1-Apr	46.7	15-May	68.0	28-Jun	77.1
2-Apr	45.9	16-May	69.0	29-Jun	76.6
3-Apr	46.3	17-May	67.8	30-Jun	78.0
4-Apr	45.8	18-May	67.5	1-Jul	79.6
5-Apr	46.4	19-May	66.6	2-Jul	80.9
6-Apr	48.2	20-May	67.5	3-Jul	81.7
7-Apr	49.1	21-May	69.2	4-Jul	81.6
8-Apr	49.9	22-May	73.2	5-Jul	80.8
9-Apr	49.9	23-May	73.2	6-Jul	80.4
10-Apr	48.3	24-May	69.9	7-Jul	80.1
11-Apr	47.8	25-May	68.6	8-Jul	80.4
12-Apr	49.5	26-May	68.1	9-Jul	80.5
13-Apr	51.8	27-May	68.4	10-Jul	79.8
14-Apr	53.8	28-May	69.1	11-Jul	80.4
15-Apr	54.2	29-May	71.1	12-Jul	80.5
16-Apr	54.9	30-May	73.5	13-Jul	81.1
17-Apr	53.8	31-May	76.9	14-Jul	82.3
18-Apr	50.9	1-Jun	78.9	15-Jul	82.1
19-Apr	47.9	2-Jun	79.3	16-Jul	80.8
20-Apr	48.0	3-Jun	77.2	17-Jul	78.8
21-Apr	49.3	4-Jun	75.5	18-Jul	77.0
22-Apr	50.1	5-Jun	74.3	19-Jul	78.4
23-Apr	51.6	6-Jun	74.6	20-Jul	81.1
24-Apr	52.7	7-Jun	73.4	21-Jul	83.3
25-Apr	54.1	8-Jun	73.3	22-Jul	84.7
26-Apr	54.7	9-Jun	74.5	23-Jul	85.5
27-Apr	53.6	10-Jun	73.0	24-Jul	85.7
28-Apr	51.7	11-Jun	71.7	25-Jul	84.6
29-Apr	53.2	12-Jun	70.6	26-Jul	82.1
30-Apr	55.3	13-Jun	72.4	27-Jul	80.7
1-May	55.8	14-Jun	73.8	28-Jul	81.5
4-May	56.2	15-Jun	75.1	29-Jul	80.7
3-May	57.9	16-Jun	77.6	30-Jul	79.3
4-May	58.8	17-Jun	77.8	31-Jul	79.2
5-May	61.2	18-Jun	75.3	1-Aug	78.7
6-May	61.7	19-Jun	72.2	2-Aug	79.8
7-May	57.4	20-Jun	72.2	3-Aug	81.6
8-May	55.0	21-Jun	72.5	4-Aug	83.7
9-May	56.0	22-Jun	74.6	5-Aug	83.9
10-May	57.8	23-Jun	74.0	6-Aug	83.1
11-May	60.1	24-Jun	73.2	7-Aug	83.4
12-May	62.7	25-Jun	73.4	8-Aug	84.4
13-May	64.6	26-Jun	77.7	9-Aug	85.3

10-Aug	85.7	23-Sep	63.4	6-Nov	64.3
11-Aug	85.4	24-Sep	62.4	7-Nov	63.6
12-Aug	82.4	25-Sep	64.8	8-Nov	54.0
13-Aug	79.9	26-Sep	64.9	9-Nov	48.8
14-Aug	79.1	27-Sep	64.6	10-Nov	51.4
15-Aug	78.6	28-Sep	63.4	11-Nov	57.4
16-Aug	77.9	29-Sep	62.8	12-Nov	58.7
17-Aug	77.3	30-Sep	62.0	13-Nov	56.0
18-Aug	76.6	1-Oct	60.8	14-Nov	52.0
19-Aug	78.1	2-Oct	59.8	15-Nov	49.4
20-Aug	80.1	3-Oct	58.7	16-Nov	48.2
21-Aug	80.4	4-Oct	56.7	17-Nov	46.1
22-Aug	79.6	5-Oct	55.9	18-Nov	43.4
23-Aug	78.5	6-Oct	56.7	19-Nov	41.6
24-Aug	77.6	7-Oct	59.7	20-Nov	39.5
25-Aug	79.7	8-Oct	59.5	21-Nov	37.7
26-Aug	79.5	9-Oct	58.0	22-Nov	37.8
27-Aug	80.9	10-Oct	57.4	23-Nov	38.3
28-Aug	80.3	11-Oct	57.8	24-Nov	38.8
29-Aug	82.8	12-Oct	58.3	25-Nov	39.7
30-Aug	79.2	13-Oct	58.9	26-Nov	40.5
31-Aug	75.8	14-Oct	60.1	27-Nov	40.8
1-Sep	77.1	15-Oct	60.1	28-Nov	41.7
2-Sep	74.8	16-Oct	59.5	29-Nov	42.0
3-Sep	78.0	17-Oct	58.5	30-Nov	42.3
4-Sep	79.4	18-Oct	56.9	1-Dec	40.8
5-Sep	79.1	19-Oct	54.1	2-Dec	39.6
6-Sep	77.8	20-Oct	51.9	3-Dec	39.6
7-Sep	75.0	21-Oct	51.9	4-Dec	39.4
8-Sep	74.0	22-Oct	52.9	5-Dec	39.2
9-Sep	75.7	23-Oct	52.8	6-Dec	38.7
10-Sep	75.2	24-Oct	53.5	7-Dec	39.4
11-Sep	74.1	25-Oct	55.1	8-Dec	40.6
12-Sep	72.0	26-Oct	56.9	9-Dec	40.8
13-Sep	72.4	27-Oct	56.5	10-Dec	40.5
14-Sep	72.1	28-Oct	50.2	11-Dec	40.3
15-Sep	72.4	29-Oct	47.7	12-Dec	39.9
16-Sep	71.6	30-Oct	47.1	13-Dec	38.8
17-Sep	71.6	31-Oct	51.3	14-Dec	37.7
18-Sep	72.6	1-Nov	57.2	15-Dec	36.3
19-Sep	73.4	2-Nov	56.7	16-Dec	36.7
20-Sep	73.6	3-Nov	54.4	17-Dec	37.2
21-Sep	73.7	4-Nov	55.4	18-Dec	36.9
22-Sep	72.4	5-Nov	61.6	19-Dec	36.4