Attachment G

Conowingo Hydroelectric Project
(FERC Project No. 405)

# Fish Kill Notification Plan

# CONOWINGO HYDROELECTRIC PROJECT
## FERC PROJECT NUMBER 405

# FISH KILL NOTIFICATION PLAN

***Prepared for:***

Constellation.

***Prepared by:***

GOMEZ AND SULLIVAN ENGINEERS

**March 2022**

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| COMAR | Code of Maryland Regulations |
| Constellation, the licensee | Constellation Energy Generation, LLC |
| DO | dissolved oxygen |
| Exelon | Exelon Generation Company, LLC |
| FERC, the Commission | Federal Energy Regulatory Commission |
| MDE | Maryland Department of the Environment |
| MDNR | Maryland Department of Natural Resources |
| mg/L | milligrams per liter |
| PFBC | Pennsylvania Fish and Boat Commission |
| Project | Conowingo Hydroelectric Project |
| US EPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |

# 1 INTRODUCTION

## 1.1 Background

Constellation Energy Generation, LLC (Constellation, the licensee) is the licensee for the 570.15-megawatt Conowingo Hydroelectric Project (Project) (Federal Energy Regulatory Commission (FERC, the Commission) Project No. 405). The Project is located on the Susquehanna River (at river mile 10) in Pennsylvania and Maryland (Figure 1.1-1). Conowingo Dam is located in Maryland connecting Cecil and Harford counties, as is the lowermost six miles of the Project reservoir, Conowingo Pond. The remaining eight miles of Conowingo Pond are located in Pennsylvania, within York and Lancaster counties.

The Project's FERC License requires Constellation to develop and implement a plan to monitor for, investigate, and report Fish Kill Events, defined as any fish kills exceeding 50 fish, that occur in the Conowingo Pond or the tailrace.[1] Specifically, Article 411 states:

> *Article 411*. Fish Kill Notification Plan. *Within one year of license issuance, the licensee must file with the Commission for approval, a fish kill monitoring plan for any fish kills exceeding 50 fish in Conowingo Pond and/or the project tailrace. The plan must include, at a minimum: (a) data collection procedures, (b) analysis methods, (c) a provision to identify any project-related causes that could have resulted in any such reported fish kills, and (d) a schedule and procedure for reporting.*
>
> *The plan must be developed after consultation with the Maryland Department of Natural Resources, the U.S. Fish and Wildlife Service, and the Pennsylvania Fish and Boat Commission. The licensee must include with the plan 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 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. 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.*

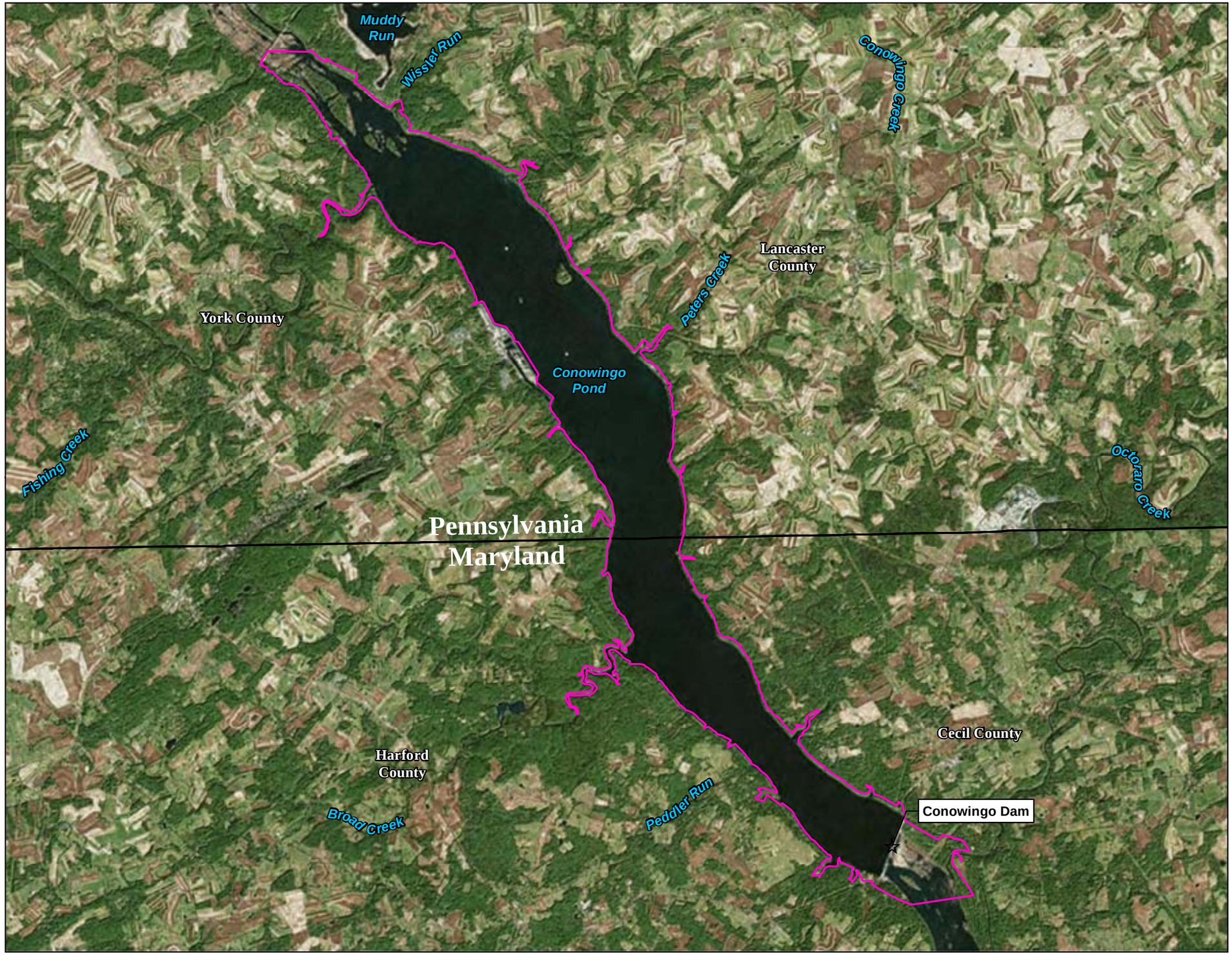
In accordance with the requirements for the contents of this plan, Constellation has developed:

- Measures to monitor for various types of potential fish kills (Section 3)
- Data collection procedures and analysis pertaining to Fish Kill Event Investigations that would be performed to identify project-related causes that could have resulted in reported or documented Fish Kill Events (Section 4)
- Schedules and procedures for Fish Kill Event notifications (Section 4.3) and reporting associated with implementing this plan (Section 5)

[1] Fish mortality in the Conowingo fish lifts and eel passage facilities will be investigated and reported separately in accordance with their relevant management plans.

## 1.2 Consultation Record

In accordance with Article 411 and the *Joint Offer of Settlement and Explanatory Statement Of Exelon Generation Company, LLC and the Maryland Department of the Environment* (Exelon 2019), Constellation provided a draft fish kill monitoring plan to the Maryland Department of the Environment (MDE), Maryland Department of Natural Resources (MDNR), Pennsylvania Fish and Boat Commission (PFBC), and the U.S. Fish and Wildlife Service (USFWS) on January 26, 2022, with a requested 30-day comment period. Comments were received from MDE, PFBC, and USFWS on the draft plan, and all comments are included in Appendix A. For each applicable comment, Constellation indicates whether and how the recommendation was adopted or provides justification for not adopting specific recommendations.





**Fish Kill Notification Plan**

**Figure 1.1-1:**
**Project Location**

**Legend**

Project Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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**CONSTELLATION ENERGY GENERATION, LLC**
**CONOWINGO HYDROELECTRIC PROJECT**
**PROJECT NO. 405**



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# 2 EXISTING INFORMATION

## 2.1 Historical Fish Kills

MDE provided historical fish kill information (1985 to present) for the Susquehanna River and major tributaries that enter the river above and below the Project dam. Several investigated fish kills had no distinguishable cause based on the results of the investigations performed. In general, the most common probable cause of fish kills identified on the Susquehanna River in Maryland has been discards from recreational and commercial fisheries. There is a high degree of fishing pressure below the Project dam, which can result in fish kills when large numbers of fish are being caught and released and subsequently succumb to angling-related injuries. Stress (e.g., seasonal, thermal, winter, migration) or disease have also been identified as probable causes in various locations. Probable causes attributed to the Project have been infrequent and have included mortalities from the fish lift and trapping facilities (e.g., gizzard shad handling stress or discards in April 1985 and July 1997), discharge of hypoxic water from the dam (July 1985), and reduction in flow releases from the dam (December 2012 and May 2015).

The most recent (December 4, 2012 and May 5, 2015) events that were attributed to the Project were both reported by members of the public with concerns about reductions in flow releases from the Project. The December 4, 2012 fish kill was attributed to stoppage of flow below the dam and was investigated at the Conowingo Fisherman's Park directly below the Project powerhouse. This fish kill included shiner species (n=200), tessellated darter (n=60), logperch (n=20), and sunfish species (n=20), for a total of around 300 fish. Flows in the Susquehanna River in the days preceding the event included baseline flows or around 4,000 cfs, along with peaking operations between 38,600 and 66,500 cfs, and periods when the flow dropped to as low as 300 cfs. Each of the peaking events were followed by rapid (e.g., nearly 17,000 cfs in half an hour) reductions in flow to the base flow level. The 2015 fish kill was located near Shures Landing and included blueback herring (n=100), gizzard shad (n=50), American shad (n=25), hickory shad (n=25), and largemouth bass (n=1) for a total of 201 fish. The complainant reported that these fish had been stranded after the gates were reportedly closed at the dam. Project operations occurring prior to this event included peaking operations on May 4$^{th}$, 2015 with flows up to 59,000 cfs in the river followed by a reduction in flow to around 9,430 cfs, including a rate reduction of over 13,000 cfs in half an hour as flows fell below 30,000 cfs. The very flow flows and/or high sub-hourly rates of water level change that potentially resulted in these fish kill events will no longer occur as part of the Project's new license, which includes a minimum flow of 4,000 cfs and down-ramping rates of up to 12,000 cfs per hour when the Project discharge is less than 30,000 cfs. This will allow for fish to adapt to changes and flow and find egress from potential stranding locations.

## 2.2 Dissolved Oxygen Enhancement and Monitoring Requirements

Dissolved oxygen (DO) is the measure of how much oxygen is available to living aquatic organisms in water. The Conowingo Pond has been shown to exhibit DO stratification (i.e., higher DO levels in near-surface waters, and lower DO levels at depth), resulting in the potential for entrainment of lower DO level waters through low-level intakes at the Project (Exelon 2012). Constellation has implemented turbine venting as well as the installation of aerating turbine runners at the Project, which significantly improved DO levels in the tailrace relative to historic conditions.

In accordance with Article 410, Constellation must continue DO enhancement at the Project using existing turbine venting systems on Units 1 through 7 and the aerating runners on Units 2 and 5. In accordance with NPDES Permit Number 19-DP-0491 and Article 410, Constellation is required to continuously monitor DO at Station 643, located approximately 0.6 miles downstream of the power station, from May 1 through October 31 each year. The minimum hourly DO concentration to maintain compliance according to the NPDES permit is 5.0 mg/L, which is substantially higher than the lethal DO requirements for relevant

species in the Project boundary. The NPDES permit also requires grab sample collection for various scenarios.

## 2.3 Fish Passage Mortality Monitoring Requirements

Mortality of fish associated with the Project's East and West Fish Lifts and eel passage systems will be monitored and documented in accordance with the Fishway Operation and Maintenance Plan (FOMP).

# 3 FISH KILL MONITORING

## 3.1 Public Outreach

Though not all fish kills will be related to the Project or its operation, Constellation will provide information at the Conowingo Visitor's Center, recreation sites, and social media to inform the public about fish kills and how to report them to Constellation and the State of Maryland and Commonwealth of Pennsylvania. These measures will be installed and will be maintained and updated on an as-needed basis. Fish kills reported by members of the public to Constellation will be investigated in accordance with Section 4. The geographic extent of fish kills that Constellation will publicize includes any location with the Conowingo Project boundary (see Figure 1.1-1).

## 3.2 Fish Kill Reconnaissance Surveys

Fish Kill Reconnaissance Surveys are a preliminary measure for identifying potential fish kills that may not be identified by members of the public or at Project fishways. Fish Kill Reconnaissance Surveys will be triggered by:

- DO values recorded by Constellation as part of NPDES and Article 410 that do not comply with the minimum DO requirements.

- Constellation staff observations of dead fish during weekly walkthroughs: Constellation will walk the safely accessible areas on the dam along the Project forebay and tailrace areas weekly to look for dead fish. Constellation will contact contracted fisheries biologists if any dead fish are observed. Fisheries biologists will determine if a Fish Kill Reconnaissance Survey is triggered.

- Fish passage contractor observations of 50 or more dead fish or 25 or more freshly dead or dying fish. Fisheries biologists contracted by Constellation are anticipated to be on-site in the Project tailrace area daily between March and early November for various fish passage operations and will look for dead fish.

Fish Kill Reconnaissance Surveys will be performed within 24 hours of a trigger. No more than one Fish Kill Reconnaissance Survey from a specific trigger will be performed in a given day, and Fish Kill reconnaissance surveys will only be performed when it is safe to do so.

Fish Kill Reconnaissance Surveys will be performed by a fisheries biologist or technician capable of identifying the fish species in the Project vicinity. During the Fish Kill Reconnaissance Surveys, surveyors will search for dead fish visually and by using binoculars. The number and location of dead fish will be recorded. Unless the location and extent of the potential fish kill is well-defined, the surveys will be performed by walking the following locations, shown in Figure 3.2-1:

- The width of the Conowingo Project tailrace, between the East Fish Lift and West Fish Lift, where it is safe to do so.

- The width of the Conowingo Project forebay area (between the Conowingo Powerhouse and East Fish Lift), where it is safe to do so.

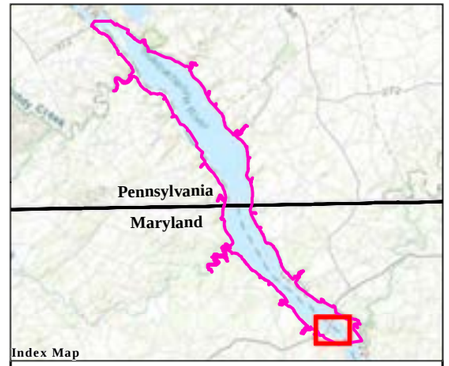
- Along the river-right shoreline from the Project powerhouse to monitoring station 643.

If Fish Kill Reconnaissance Surveys identify a fish kill[2], a Fish Kill Event Investigation will be triggered (Section 4). Even if no investigation is triggered, observations of 25 or more dead fish will trigger notification to MDE if observed in Maryland waters within the Project area (Section 4.3).

### 3.3 Fish Passage Mortality

Though monitoring associated with fishways (including eel passage systems) will be implemented in accordance with the FOMP, incidents involving 50 or more dead fish per day will be considered a Fish Kill Event as part of this plan and will trigger a Fish Kill Event Investigation (Section 4) and associated notification and reporting.

[2] A fish kill is defined as fifty (50) or more dead fish, except in Maryland waters where a fish kill may also be defined as at least 25 freshly dead or dying fish.


**Fish Kill Notification Plan**

**Figure 3.2-1:**
**Fish Kill Reconnaissance Survey Area**

**Legend**

- Project Boundary
- Water Quality Monitoring Station
- Fish Kill Reconnaissance Survey Walking Path

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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**CONOWINGO HYDROELECTRIC PROJECT**
**PROJECT NO. 405**

Constellation



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# 4 FISH KILL EVENT INVESTIGATION

## 4.1 Response

Potential Fish Kill Events within the Conowingo Project boundary (see Figure 1.1-1) reported to Constellation by members of the public or resource agencies will be responded to as soon as practicable and safe, with the goal of fisheries biologists and/or technicians performing a site visit within 24 hours to confirm and characterize the Fish Kill Event. For Fish Kill Events identified by a Fish Kill Reconnaissance Survey, a Fish Kill Event Investigation will be performed immediately.

The response to a potential Fish Kill Event will include:

- Recording the time and location of the potential Fish Kill Event
- Collecting applicable information on conditions (e.g., weather, flows, Project operations, water temperature and DO measurements) at the time of the survey
- Collecting photos of the potential Fish Kill Event, including representative photos of the area, dead fish, and individual fish
- Recording a description of the extent of the documented potential Fish Kill Event, including the upstream and downstream extent of observed fish kills,
- Identifying the dead fish to species
- Recording the number and size class (e.g., adult, juvenile, young-of-year) of each species
- Recording the freshness of specimens (e.g., moribund, freshly dead, decayed)
- Examining specimens for injuries or trauma and recording the approximate frequency
- Identifying activities in the area that may have resulted in an identified Fish Kill Event (e.g., heavy angling activity, chemical spill, signs that fish had been discarded)
- Identifying whether the event is a Fish Kill Event and if it is still occurring or progressing
- Identifying any actions taken (e.g., notifications)

The information gathered will be recorded on standardized datasheets, which are included in Appendix B. If fifty (50) or more dead fish are identified anywhere within the Project area, or if 25 freshly dead or dying fish are identified within Maryland waters within the Project area, are identified during the Fish Kill Event Investigation, it will be considered a Fish Kill Event and MDE and PFBC will be notified in accordance with Section 4.3.

## 4.2 Preliminary Analyses

Data gathered during a Fish Kill Event will be compiled and summarized. Operations and flow data from the Project, along with the continuous DO data from the downstream monitor, if relevant and available, will be compiled and plotted. Relevant information will be reviewed to determine if Project operations contributed to the fish kill.

## 4.3 Notification

Constellation will notify state agencies of confirmed Fish Kill Events as soon as feasible following an event. To ensure that contact information for notifications is up-to-date, Constellation will maintain a Fish Kill Notifications Flow Chart (Table 4.3-1). The Flow Chart will include the necessary contact information for fish kills that are identified in Pennsylvania and Maryland. Notifications provided will include the Constellation primary contact and contracted fisheries biologist responsible for performing the fish kill investigation. [3]

**Table 4.3-1: Fish Kill Notifications Flow Chart Template**

| **Contracted Fish Kill Investigation Biologist** | | |
|---|---|---|
| ↓ | | |
| **Constellation FERC License Compliance Manager (PRIMARY CONTACT)** | | |
| ↓ | ↓ | ↓ |
| **Conowingo Visitors Center** 1-410-457-2427 | **Pennsylvania Fish Kills** | **Maryland Fish Kills** |
| | Pennsylvania Department of Environmental Protection 1-800-541-2050 | Pennsylvania Fish and Boat Commission 1-855-347-4545 | MDE Fish Kill Response Program 1-866-633-4686 |

[3] Contact information is expected to change over the lifetime of this plan; therefore, Constellation has not included specific staff contact information as part of this document. Resource agency and Constellation staff contact information will be included in the official notification table, which will be updated on an as-needed basis. Constellation will provide a current phone number and email of the primary contact to resource agencies.

# 5 REPORTING

## 5.1 Fish Kill Event Investigations

Information gathered during a Fish Kill Event Investigation will be summarized in a report, which will be provided to the Maryland Department of the Environment's Fish Kill Investigation Section and PFBC within one week of the Fish Kill Event. The report will include the details of the information gathered (see Appendix B), along with representative photographs and annotations.

## 5.2 Annual Summaries

Constellation will provide MDE, MDNR, PFBC, USFWS, and FERC with a summary report by February 15 of each year. The report will describe the activities performed as part of implementing this plan during the prior calendar year, and will include:

- Thresholds that triggered Fish Kill Reconnaissance Surveys[4]
- Summaries of Fish Kill Events identified, and notifications performed
- Individual Fish Kill Event Investigation Reports attached in an appendix

# 6 IMPLEMENTATION SCHEDULE

Implementation of this plan will be performed within one (1) year of approval of this plan by the FERC

# 7 PLAN UPDATES

This plan may be updated based on experiences gained and data collected during implementation of this plan. Any modifications would be developed in consultation with MDE, MDNR, PFBC, USFWS and would be subject to approval by the agencies and the FERC.

[4] DO monitoring will be reported separately from this plan on an annual basis, in accordance with Article 410 of the license and the NPDES permit. However, instances of DO thresholds triggering Fish Kill Reconnaissance Surveys will be included as part of reporting for this plan.

## 8 REFERENCES

Exelon Generation Company, LLC (2012). Seasonal and Diurnal Water Quality in Conowingo Pond and Below Conowingo Dam – RSP 3.1, Final Study Report. Prepared for Exelon by Normandeau Associates, Inc. and Gomez and Sullivan Engineers. August 2012.

Exelon Generation Company, LLC. (2016). *Conowingo Hydropower Project Settlement Agreement Between Exelon Generation Company, LLC and the United States Department of the Interior Fish & Wildlife Service.*

Exelon Generation Company, LLC and the Maryland Department of the Environment. (2019). *Joint Offer of Settlement and Explanatory Statement Of Exelon Generation Company, LLC and the Maryland Department of the Environment.*

Federal Energy Regulatory Commission. (2015). *Final Multi-Project Environmental Impact Statement For Hydropower Licenses.* Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Licensing. Washington, DC: Federal Energy Regulatory Commission.

U.S. Environmental Protection Agency (US EPA). (1986). Ambient Water Quality Criteria for Dissolved Oxygen (Freshwater). U.S. EPA. Office of Research and Development, Environmental Research Laboratories. Duluth, MN and Narragansett, RI.

# APPENDIX A. CORRESPONDENCE ON DRAFT PLAN

**Erin Redding**

**From:** Erin Redding
**Sent:** Wednesday, January 26, 2022 9:40 PM
**To:** Heather Nelson, MDE; David Seaborn. MDE; Brett Coakley, MDNR; Tony Prochaska; Bob Sadzinski; Shawn Seaman, MDNR; Josh Tryninewski; Aaron Henning, SRBC; Sheila Eyler, USWFS; Richard McCorkle; Steve Minkkinen; Jesus Morales
**Cc:** David Frazier; Kirk Smith; Ian Kiraly; Danucalov, Andrea
**Subject:** Fish Kill Notification Plan
**Attachments:** 20220126_Fish_Kill_Notification_Plan_Draft.pdf

Hello,

Exelon has prepared the attached Fish Kill Notification Plan Draft in accordance with Conowingo Hydroelectric Project Federal Energy Commission License Article 411. Please review this plan and provide any comments to Andrea Danucalov and me by February 25, 2021.

Sincerely,

***Erin Redding*** (she/her)
**Certified Senior Ecologist, ESA**
**Gomez and Sullivan Engineers, D.P.C.**
1961 Wehrle Dr.
Suite 12
Williamsville, NY 14221
eredding@gomezandsullivan.com
Please note, I do not work on Wednesdays.

**Erin Redding**

**From:** Eyler, Sheila <sheila_eyler@fws.gov>
**Sent:** Thursday, January 27, 2022 12:41 PM
**To:** Erin Redding; Heather Nelson, MDE; David Seaborn. MDE; Brett Coakley, MDNR; Tony Prochaska; Bob Sadzinski; Shawn Seaman, MDNR; Tryninewski, Joshua; Aaron Henning, SRBC; McCorkle, Richard; Minkkinen, Steve; Morales, Jesus J
**Cc:** David Frazier; Kirk Smith; Ian Kiraly; Danucalov, Andrea
**Subject:** EXTERNAL EMAIL -Re: [EXTERNAL] Fish Kill Notification Plan



Andrea,

Thank you for the opportunity to review the Fish Kill Notification Plan for the Conowingo Project.

The USFWS recommends adding surveys of the spillway area of the tailrace for potential fish kills. Fish mortality has been observed in this area previously due to rapid dewatering of the spillway and warrants future surveying to ensure project operations do not provide conditions where fish kills may occur.

Please reach out if you have any questions or would like to discuss this comment further.

Sheila Eyler
U.S. Fish and Wildlife Service
Mid-Atlantic Fish & Wildlife Conservation Office
177 Admiral Cochrane Dr.
Annapolis, MD 21401
717-387-2117

**Constellation Fish Kill Plan - Comment Document** February 23, 2022

Second Paragraph page 1. The State of Maryland defines a reportable fish kill as 25 dead fish, not 50.

Article 411, second paragraph, should also include Maryland Department of Environment. This agency (MDE) has responsibility for investigating Fish Kill events in Maryland in a timely fashion.

The geographical extent of "tailrace" needs to be expanded upon. Any event occurring downstream of and within a mile (monitoring station 643 is 0.6 miles) of the dam "could" be related to discharge quantity or quality at the dam and needs to be investigated.

Section 2.1. MDE has records of 20 fish kills that have occurred either in the Conowingo Pool or downstream of the Conowingo Dam (in close proximity to the dam) since 1985. Several of them involved either dam discharge flows or the concentration of migratory fish attempting to pass through the fish lifts. Others involved disease and fishing discards. In several cases the cause was unknown.

Section 2.2. Should also include blueback herring (*Alosa aestivalis*), blue catfish *(Ictalurus furcatus*), flathead catfish (*Pylodictis olivari*s), walleye (*Sander vitreum*), Rock Bass (*Ambloplites rupestris*), largemouth bass (*Micropterus salmoides*), crappie (*Pomoxis* sp.), and sunfish (*Lepomis* spp.). Also within the project area, but downstream of the dam, are striped bass (*Morone saxatilus*) and yellow perch (*Perca flavescens*). Other species, particularly benthic species (e.g. tessellated darter, chesapeake logperch), are more susceptible to localized water quality issues due to their small home ranges and, therefore, require immediate investigation if they are observed.

Section 2.2.2 (American Shad), add blueback herring

Section 2.2.3 (Gizzard Shad), add "increasing or "….decreasing water temperatures

Section 2.3 should be 25 minimum dead fish observed

Section 4.1 should be 25 minimum dead fish observed

Section 4.3 (Notification). It will be necessary for MDE to have timely communication with the lead biologist who is investigating noteworthy events leading up to generation of a report later in the week. If an event generates significant public interest, MDE's office of Communications may need timely updates from MDE and/or Constellation's designated biologists as well.

We suggest Constellation add the degree of observed freshness to fish kill events. Small numbers of fish that die for a variety of natural and anthropogenic reasons from the vicinity may tend to congregate either above or below the dam in various stages of decomposition. Twenty-five moribund or freshly dead fish should take precedence for a timely investigation.

Add emails for timely fish kill reporting to MDE Charles.Poukish@maryland.gov, Chris.Luckett@maryland.gov

MDE Fish Kill personnel need contacts for Constellation in case a fish kill incident is reported to the hotline and an investigation is initiated by the state of Maryland.

What are the geographic boundaries established for Constellation to perform autonomous fish kill investigations? The Susquehanna River is considered “Waters of the State”. Hence, any fish kill that occurs near Conowingo Dam should be reported to MDE as soon as possible.

“A special responsibility mandated by Environmental Article Section 4-405C requires management and control agencies to investigate the occurrence of damage to aquatic resources, including but not limited to, mortality of fish and other aquatic life. The investigation should determine the nature and extent of the event and attempt to establish a cause and source if applicable. If appropriate, findings shall be acted upon to require the repair of any damage done and the restoration of water resources to a degree necessary to protect the best interests of the people of the state.”

“This responsibility requires that management and control agencies deal promptly and effectively with the investigation of fish kills. Many people are aware of the problems caused by pollution. The presence of dead fish may indicate that a toxic substance has entered the waterway. For this reason, it is very important that the responsible agencies quickly ascertain the facts, announce the findings, and institute corrective measures if practical.”

**Erin Redding**

**From:** Tryninewski, Joshua <jtryninews@pa.gov>
**Sent:** Friday, February 25, 2022 4:08 PM
**To:** Erin Redding; Danucalov, Andrea
**Cc:** David Frazier; Kirk Smith; Ian Kiraly; Heather Nelson, MDE; David Seaborn. MDE; Brett Coakley, MDNR; Tony Prochaska; Bob Sadzinski; Shawn Seaman, MDNR; Aaron Henning; Sheila Eyler; McCorkle, Richard; Steve Minkkinen; Jesus Morales
**Subject:** EXTERNAL EMAIL -RE: [External] Fish Kill Notification Plan



Erin & Andrea,

The PFBC has reviewed the "FISH KILL NOTIFICATION PLAN DRAFT" dated January 2022 and offers the following comments for your consideration.

- Section 1.1 Background (page 1)
  - Conowingo Pond and/or Tailrace reference in the Article 411 excerpt
    - Is the entire Conowingo Pond included in fish kill surveillance?
    - Does "project tailrace" include the spillway?
    - Recommend adding a figure delineating the area(s) included within the fish kill surveillance area.
    - There is no discussion about fish kills resulting from fish lift malfunctions. Should these infrequent events be captured in this plan?

- Section 2.1 Fish Kill Events within the Conowingo Project (page 2)
  - Does the "Conowingo Project boundary" referenced in the first sentence of this section differ from the "Conowingo Pond and/or Tailrace" referenced in the Article 411 excerpt of section 1.1?

- Section 3.2 Fish Kill Reconnaissance Surveys (Page 4)
  - Second Bullet – Exelon will walk the safely accessible areas on the dam along the Project forebay and tailrace areas weekly to look for dead fish.
    - For areas that are not safely accessible or too distant or removed from direct observation (e.g. the spillway) or not safely accessible via routine walk-throughs, could remote control drone surveillance be considered?
  - Second paragraph and subsequent bullets:
    - Please provide definition(s) for the phrases "when safe to do so" and "where safe to do so" and what conditions will preclude surveillance
    - Will the surveillance area between the East and West fish lifts and the width of the forebay area be constant or influenced by plant operations?
    - Recommend including a figure that delineates the surveillance areas addressed in these three bullets.

- Section 4.1 Response (Page 6)
  - 4th Bullet, Recording a description of the extent of the documented potential Fish Kill Event
    - Recommend including the statement "the upstream and downstream extent of observed fish kills" to this bullet

- Section 4.3 Notification
  - During Normal Working Hours (Page 6)

        - Please included: “and the Pennsylvania Fish and Boat Commission at 1-855-347-4545 (1-855-Fish-Kil).” to the end of sentence: Calls for incoming fish kill reports in Pennsylvania should be directed to the Pennsylvania Department of Environmental Protection at 1-800-541-2050.
    - During Evenings, Weekends and Holidays (Page 6)
        - Please included: “and the Pennsylvania Fish and Boat Commission at 1-855-347-4545 (1-855-Fish-Kil).” to the end of sentence: Calls for incoming fish kill reports in Pennsylvania should be directed to the Pennsylvania Department of Environmental Protection at 1-800-541-2050.
    - During any notification process of a Fish Kill event with in PA’s jurisdictionally waters, please include a contact name and number for a local point of contact per fish kill event. Doing so will facilitate effective and efficient communications that may need to occur between PFBC Law Enforcement and Conowingo’s fish kill response team.

- Appendix B, Fish Kill Investigation Response Sheet
    - Recommend adding a column to the *Fish Involved in Fish Kill Event table* that captures photo documentation. Column header could be as simple as “Photo Taken (Y/N)”
    - Recommend providing photo(s) with annotations as attachments to the Response Sheet.
    - Recommend adding a space on the form to collect information regarding resource agency contact(s) (documenting who and when)

Thank you for the opportunity to review and provide comments.

Regards,
-Josh

**Joshua D. Tryninewski**
Anadromous Fish Restoration Unit
Pennsylvania Fish & Boat Commission
1735 Shiloh Rd.
State College, PA 16801
Office: 814-353-2239
Cell: 814-424-0985
Fax: 814-355-8264
Email: jtryninews@pa.gov

From: David Seaborn -MDE- <david.seaborn@maryland.gov>

Sent: Friday, March 18, 2022 2:53 PM

To: Danucalov, Andrea H:(Constellation Power) <Andrea.Danucalov@constellation.com>

Subject: [EXTERNAL]Fish Kill Monitoring Plan - one item

EXTERNAL MAIL. Do not click links or open attachments from unknown senders or unexpected Email.

Andrea,

We have a hang up over whether 50 or 25 dead fish triggered certain responses. The current Plan being written provides for 50 as being the threshold to initiate an investigation. Perhaps there is a compromise. Specifically, we would like to have two things considered:

1. Notify MDE of accumulations greater than 25 even though it doesn't trigger your investigation. This is because you are not assessing outside the project zone, and in some cases there could be more dead fish downstream. It would fall on MDE to follow up or not. It may dovetail with an ongoing investigation or a priori information we have. Another reason for notification is that MDE houses the fish kill records for all events in Waters of the State.

2. Another change would be to investigate for "50 dead fish or 25 freshly dead or actively dying fish". The dam has a natural propensity to concentrate all forms of flotsam and jetsam, including fish that died over extended times and in different places. Twenty five mostly old fish in varying stages of decay should not concern them, but 25 fish that are actively dying or freshly dead within sight of the dam (which is our protocol for response) should.

Please let me know your thoughts. Everything else is fine.

--

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**Comments and Responses**

| Comment | Response |
|---|---|
| **USFWS comments, received January 27, 2022** | |
| The USFWS recommends adding surveys of the spillway area of the tailrace for potential fish kills. Fish mortality has been observed in this area previously due to rapid dewatering of the spillway and warrants future surveying to ensure project operations do not provide conditions where fish kills may occur. | Constellation is required to operate in accordance with Article 407 of the Project license, which includes down-ramping rates that were designed to prevent rapid dewatering of the spillway area and associated stranding effects.<br><br>Additionally, the spillway area is a difficult to access and dangerous location to send personnel for performing fish kill reconnaissance surveys and it is unlikely that remote survey technology (e.g., drones) would be able to identify small dead fish, as would be required by this plan.<br><br>Therefore, fish kill reconnaissance surveys in the spillway area have not been included as part of this plan. |
| **MDE and MDNR comments, received February 23, 2022** | |
| Second Paragraph page 1. The State of Maryland defines a reportable fish kill as 25 dead fish, not 50. | The threshold for investigations has been changed to 25 freshly dead or dying fish (for Maryland waters within the Project area) in accordance with this and other comments received from MDE/MDNR. |
| Article 411, second paragraph, should also include Maryland Department of Environment. This agency (MDE) has responsibility for investigating Fish Kill events in Maryland in a timely fashion. | Constellation has included MDE in consultation for development of this plan.<br><br>This license article has been written by FERC as part of the Conowingo Hydroelectric Project license. Constellation is not able add MDE to the language of Article 411. |
| The geographical extent of "tailrace" needs to be expanded upon. Any event occurring downstream of and within a mile (monitoring station 643 is 0.6 miles) of the dam "could" be related to discharge quantity or quality at the dam and needs to be investigated. | The geographic extent of this plan includes locations within the Conowingo Project boundary. This includes Conowingo Pond and the river downstream past monitoring station 643. Water from the various Project structures becomes largely mixed by the time it reaches monitoring station 643. Fish kills resulting from water quantity or quality at the Project would occur upstream of monitoring station 643 and this location is an appropriate downstream extent. The extent of Fish Kill Reconnaissance Surveys has been revised to include downstream areas extending to monitoring station 643 (see Figure 3.2-1). |

| Comment | Response |
|---|---|
| Section 2.1. MDE has records of 20 fish kills that have occurred either in the Conowingo Pool or downstream of the Conowingo Dam (in close proximity to the dam) since 1985. Several of them involved either dam discharge flows or the concentration of migratory fish attempting to pass through the fish lifts. Others involved disease and fishing discards. In several cases the cause was unknown. | Since obtaining this comment, Constellation has requested and received records of fish kills in the area since 1985 and has incorporated a general discussion of the records into Section 2.1 of this plan. |
| Section 2.2. Should also include blueback herring (*Alosa aestivalis*), blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictis olivaris*), walleye (*Sander vitreum*), Rock Bass (*Ambloplites rupestris*), largemouth bass (*Micropterus salmoides*), crappie (*Pomoxis* sp.), and sunfish (*Lepomis* spp.). Also within the project area, but downstream of the dam, are striped bass (*Morone saxatilus*) and yellow perch (*Perca flavescens*). Other species, particularly benthic species (e.g. tessellated darter, Chesapeake logperch), are more susceptible to localized water quality issues due to their small home ranges and, therefore, require immediate investigation if they are observed. | Section 2.2 was informative in nature and was not meant to preclude any species from investigation as part of this plan.<br><br>Upon review of this plan and comments received, Constellation has removed the species-specific information in this section. |
| Section 2.2.2 (American Shad), add blueback herring | Upon review of this plan and comments received, Constellation has removed the species-specific information in this section. |
| Section 2.2.3 (Gizzard Shad), add “increasing or ”….decreasing water temperatures | Upon review of this plan and comments received, Constellation has removed the species-specific information in this section. |
| Section 2.3 should be 25 minimum dead fish observed Section 4.1 should be 25 minimum dead fish observed | This plan has been developed to address the FERC license Article 411 requirements, which calls for monitoring of fish kills of 50 or more fish. |
| Section 4.1 should be 25 minimum dead fish observed | This plan has been developed to address the FERC license Article 411 requirements, which calls for monitoring of fish kills of 50 or more fish. |
| Section 4.3 (Notification). It will be necessary for MDE to have timely communication with the lead biologist who is investigating noteworthy events leading up to generation of a report later in the week. If an event generates significant public interest, MDE’s office of Communications may need timely updates from MDE and/or Constellation’s designated biologists as well. | Section 4.3 has been revised to clarify that notifications regarding confirmed fish kill events will include contact information for the biologist performing the fish kill investigation.<br><br>Constellation will rely on MDE’s identified contact to update their Office of Communications and to determine whether an event generates significant public interest. |

| Comment | Response |
|---|---|
| We suggest Constellation add the degree of observed freshness to fish kill events. Small numbers of fish that die for a variety of natural and anthropogenic reasons from the vicinity may tend to congregate either above or below the dam in various stages of decomposition. Twenty-five moribund or freshly dead fish should take precedence for a timely investigation. | Section 4.1 and Appendix B have been revised to include recorded observations of fish freshness. |
| Add emails for timely fish kill reporting to MDE Charles.Poukish@maryland.gov, Chris.Luckett@maryland.gov | Contact information is expected to change over the lifetime of this plan; therefore, Constellation has not included specific contact information as part of this plan. Section 4.3 has been revised to include a Fish Kill Notification Flow Chart template, which will be maintained and updated by Constellation. The initial contact information to be included in the flow chart will be confirmed with MDE and PA DEP in a timely manner after FERC approval of this plan. |
| MDE Fish Kill personnel need contacts for Constellation in case a fish kill incident is reported to the hotline and an investigation is initiated by the state of Maryland. | Contact information is expected to change over the lifetime of this plan; therefore, Constellation has not included specific contact information as part of this plan.<br><br>Constellation's FERC License Compliance Manager will be responsible for implementing this plan. Contact information will be provided to MDE, PADEP, and PFBC and updates will be provide by Constellation as necessary. |
| What are the geographic boundaries established for Constellation to perform autonomous fish kill investigations? The Susquehanna River is considered "Waters of the State". Hence, any fish kill that occurs near Conowingo Dam should be reported to MDE as soon as possible. | The geographic boundaries of this plan require fish kill investigations to be performed by Constellation within the Conowingo Project area, which includes Conowingo Pond and the Susquehanna River downstream to the approximate location of monitoring station 643.<br><br>Section 4.3 has been modified to include a flow chart for the notification process, and to state that confirmed fish kill events will be reported as soon as feasible. The flow chart notification process provided by Constellation will ensure timely reporting of fish kills. |

| Comment | Response |
|---|---|
| "A special responsibility mandated by Environmental Article Section 4-405C requires management and control agencies to investigate the occurrence of damage to aquatic resources, including but not limited to, mortality of fish and other aquatic life. The investigation should determine the nature and extent of the event and attempt to establish a cause and source if applicable. If appropriate, findings shall be acted upon to require the repair of any damage done and the restoration of water resources to a degree necessary to protect the best interests of the people of the state." | Constellation acknowledges the responsibilities of the management and control agencies. |
| "This responsibility requires that management and control agencies deal promptly and effectively with the investigation of fish kills. Many people are aware of the problems caused by pollution. The presence of dead fish may indicate that a toxic substance has entered the waterway. For this reason, it is very important that the responsible agencies quickly ascertain the facts, announce the findings, and institute corrective measures if practical. | Constellation acknowledges the responsibilities of the management and control agencies. |
| **PFBC comments, February 25, 2022** | |
| Section 1.1 Background (page 1), Conowingo Pond and/or Tailrace reference in the Article 411 excerpt | |
| Is the entire Conowingo Pond included in fish kill surveillance? | The entirety of Conowingo Pond has been included within the area where fish kill investigations will be performed if reported by members of the public. Public outreach efforts are a fish kill monitoring component of this plan. |
| Does "project tailrace" include the spillway? | Constellation is required to operate in accordance with Article 407 of the Project license, which includes down-ramping rates that were designed to prevent rapid dewatering of the spillway area and associated stranding effects.<br><br>Additionally, the spillway area is a difficult to access and dangerous location to send personnel for performing fish kill reconnaissance surveys and it is unlikely that remote survey technology (e.g., drones) would be able to identify small dead fish, as would be required by this plan.<br><br>Therefore, fish kill reconnaissance surveys in the spillway area have not been included as part of this plan. |

| Comment | Response |
|---|---|
| Recommend adding a figure delineating the area(s) included within the fish kill surveillance area. | Figure 3.2-1 has been added to the plan. |
| There is no discussion about fish kills resulting from fish lift malfunctions. Should these infrequent events be captured in this plan? | This has been clarified by adding Sections 2.3 and 3.3 to this plan. |
| Section 2.1 Fish Kill Events within the Conowingo Project (page 2), Does the "Conowingo Project boundary" referenced in the first sentence of this section differ from the "Conowingo Pond and/or Tailrace" referenced in the Article 411 excerpt of Section 1.1? | Conowingo Pond and the tailrace are both located within the Conowingo Project Boundary. |
| Section 3.2 Fish Kill Reconnaissance Surveys (Page 4) | |
| Second Bullet – Exelon will walk the safely accessible areas on the dam along the Project forebay and tailrace areas weekly to look for dead fish. For areas that are not safely accessible or too distant or removed from direct observation (e.g. the spillway) or not safely accessible via routine walk-throughs, could remote control drone surveillance be considered? | It is unlikely that remote survey technology (e.g., drones) would be able to identify small dead fish, as would be required by this plan. |
| Second paragraph and subsequent bullets: | |
| Please provide definition(s) for the phrases "when safe to do so" and "where safe to do so" and what conditions will preclude surveillance | Safety will depend upon a number of factors including location, spill and river conditions, and weather. These factors will dictate Constellation's ability to safely launch a boat, launch a drone, or access from the shoreline. Environmental conditions such as these will be noted and a decision will be coordinated with the FERC License Compliance and Recreation Manager, Plant Manager, and Safety Specialist along with response team. Safety decisions will be documented as part of Fish Kill Event Investigations. As soon conditions improve, Constellation will re-assess and deploy a response team. |
| Will the surveillance area between the East and West fish lifts and the width of the forebay area be constant or influenced by plant operations? | The reconnaissance evaluations performed in these areas would occur over the entirety of those aeras and would not be influenced by plant operations. |
| Recommend including a figure that delineates the surveillance areas addressed in these three bullets. | Figure 3.2-1 has been added to the plan. |
| Section 4.1 Response (Page 6) | |

| Comment | Response |
|---|---|
| 4th Bullet, Recording a description of the extent of the documented potential Fish Kill Event, Recommend including the statement "the upstream and downstream extent of observed fish kills" to this bullet | "Including the upstream and downstream extent of the observed fish kill event" has been added to the fourth bullet.<br><br>A place for this information has also been added to Appendix B. |
| Section 4.3 Notification | |
| During Normal Working Hours (Page 6), Please included: "and the Pennsylvania Fish and Boat Commission at 1-855-347-4545 (1-855-Fish-Kil)." to the end of sentence: Calls for incoming fish kill reports in Pennsylvania should be directed to the Pennsylvania Department of Environmental Protection at 1-800-541-2050. | PFBC has been added to the revised notification section. Phone numbers will be kept on a current notification workflow that is maintained by Constellation's FERC License Compliance Manager. |
| During Evenings, Weekends and Holidays (Page 6), Please included: "and the Pennsylvania Fish and Boat Commission at 1-855-347-4545 (1-855-Fish-Kil)." to the end of sentence: Calls for incoming fish kill reports in Pennsylvania should be directed to the Pennsylvania Department of Environmental Protection at 1-800-541-2050. | PFBC has been added to the revised notification workflow. |
| During any notification process of a Fish Kill event within PA's jurisdictionally waters, please include a contact name and number for a local point of contact per fish kill event. Doing so will facilitate effective and efficient communications that may need to occur between PFBC Law Enforcement and Conowingo's fish kill response team. | This request has been incorporated in the revised Section 4.3 |
| Appendix B, Fish Kill Investigation Response Sheet | |
| Recommend adding a column to the Fish Involved in Fish Kill Event table that captures photo documentation. Column header could be as simple as "Photo Taken (Y/N)" | This column has been added. |
| Recommend providing photo(s) with annotations as attachments to the Response Sheet. | Representative photographs and annotations have been added to the report outlined in Section 5.1 (Fish Kill Event Investigation Reporting) |
| Recommend adding a space on the form to collect information regarding resource agency contact(s) (documenting who and when) | This has been added. |

| **MDE and MDNR comments, received March 18, 2022** | |
|---|---|
| **Comment** | **Response** |
| …We would like to have two things considered:<br><br>1. Notify MDE of accumulations greater than 25 even though it doesn't trigger your investigation. This is because you are not assessing outside the project zone, and in some cases there could be more dead fish downstream. It would fall on MDE to follow up or not. It may dovetail with an ongoing investigation or *a priori* information we have. Another reason for notification is that MDE houses the fish kill records for all events in Waters of the State.<br><br>2. Another change would be to investigate for "50 dead fish or 25 **freshly dead or actively dying** fish". The dam has a natural propensity to concentrate all forms of flotsam and jetsam, including fish that died over extended times and in different places. Twenty five mostly old fish in varying stages of decay should not concern them, but 25 fish that are actively dying or freshly dead within sight of the dam (which is our protocol for response) should. | These comments have been addressed in various sections of the plan, with reporting of at least 25 dead fish observed to MDE for areas within Maryland waters that are within the Project area. Additionally, investigations will be performed if 25 or more freshly dead or dying fish are observed in Maryland waters within the Project area. |

## APPENDIX B. FISH KILL EVENT INVESTIGATION RESPONSE DATA COLLECTION FORM

# Fish Kill Event Investigation Response Sheet

| | |
|---|---|
| Surveyor(s): | |
| Date: | Time: |
| Location/GPS Coordinates: | |
| Weather: | |
| Description of Trigger for Fish Kill Investigation: | |
| Flow/Project Operations: | |
| Temperature and DO measurements: | |
| | |
| | |
| Description of Fish Kill Event: | |
| Upstream extent: | |
| Downstream extent: | |

**Fish Involved in Fish Kill Event**

| Species | Number | Size Class (Adult, Juvenile, YOY) | Freshness (e.g., moribund, freshly dead, decayed) | Injuries or Trauma and approximate frequency | Photo |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
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|---|
| Activities in the area that may have resulted in the Fish Kill Event: |
| |
| Is Fish Kill Event still in progress? (Yes/No) |
| Action taken: |
| Description of Agency Notifications (e.g., contacts, date/time) |