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Natural Resources Conservation Service

EAXX-005-53-042-1407463611

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Environmental Assessment Rehabilitation of Flood Retarding Structure PA-463 (Leavitt Branch Dam) of the Brodhead Creek Watershed



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PROPOSAL INFORMATION

General Information

Proposal Name: Environmental Assessment Rehabilitation of Flood Retarding Structure PA-463 (Leavitt Branch Dam) of the Brodhead Creek Watershed

Proposal Tracking #: EAXX-005-53-042-1407463611

Proposal Initiation Date: 2/28/2024

Proponent Name: Monroe County Conservation District and the Monroe County Commissioners

Signing Authority: PA State Conservationist

Responsible Official: Denise Coleman

Unit: Pennsylvania NRCS State Office

Anticipated Implementation of Proposal: March 2030

Proposal Record Location: Harrisburg State Office

GIS Info: Harrisburg State Office

Proposal Webpage: <https://www.nrcs.usda.gov/programs-initiatives/watershed-protection-and-flood-prevention-operations-program/pennsylvania>

General Location of Proposal: The PA-463 (Leavitt Branch Dam) project site lies within the Upper Brodhead Creek watershed in Monroe County. It is located within the north central section of Barrett Township and provides flood protection to the town of Canadensis. It's approximately one mile to the northern side of Rt. PA-477 and generally parallels Rt. PA-390.

-Latitude: 41.208541 N

-Longitude: -75.246839 W

-HUC12: 02401040901.

Purpose and Need

The purpose of the proposed action is to rehabilitate PA-463 (Leavitt Branch Dam) to address identified dam safety deficiencies and reduce risks to human life, property, and infrastructure associated with potential dam failure while also continuing to provide flood prevention benefits to the watershed, which was the original authorized purpose of the watershed dam.

The need for the proposed action is based on identified hydraulic and structural deficiencies that prevent PA-463 from meeting current NRCS and Pennsylvania Department of Environmental Protection (PADEP) dam safety and performance criteria.

The dry dam is classified as a High Hazard Potential structure, indicating that failure would likely result in loss of human life. Under current conditions, continued

deterioration of the principal spillway, auxiliary spillway, and embankment, along with inadequate spillway capacity, increases the risk of failure during large storm events.

Without corrective action, the dam would remain at risk of failure, which could result in significant adverse effects to downstream populations, structures, infrastructure, and the surrounding community. Rehabilitation is needed to address these deficiencies, restore compliance with current standards, and reduce the risk of catastrophic dam failure.

Proposed Action

The preferred alternative is the structural rehabilitation of the dam to address deficiencies and bring the dam up to current NRCS and PADEP dam safety criteria, including meeting the NRCS Conservation Practice Standard for Dams, CPS Code 402. Rehabilitation measures consist of the installation of an armoring system within the auxiliary spillway and installation of a stilling basin to address stability integrity concerns; lengthening the effective weir crest length to pass the FBH without overtopping the dam; leveling the dam crest to provide required freeboard during design storm events; and making repairs to the principal spillway intake riser. A map of the preferred alternative is included in the Appendix.

Alternatives to the Proposed Action

As a part of the planning process, reasonable alternatives studied in detail included the No Action alternative. The No Action represents the same baseline condition in which no federal rehabilitation project is implemented at the PA-463 dam. Under this condition, the dam would remain in place and continue to operate under its current operation and maintenance plan; however, no major rehabilitation would occur to address structural or hydraulic deficiencies beyond routine maintenance and minor repairs. Structural deterioration, particularly of the principal spillway, auxiliary spillway, and embankment, would continue over time, increasing the risk of breach during a significant storm event. The dam is assumed to eventually fail due to structural deterioration, inadequate spillway capacity, or overtopping and would not be subsequently rebuilt.

A dam failure under such conditions would result in catastrophic downstream flooding, substantial property and infrastructure damage, and potential loss of life. This condition serves as the baseline against which all action alternatives are evaluated. A breach is projected to affect approximately 84 residential structures, 23 commercial properties, and 5 institutional facilities, with a Population at Risk (PAR) of at least 411 residents. Additionally, 12 bridges, 9.8 miles of state roads, and nearly 3.2 miles of local roads fall within the predicted inundation zone.

Alternatives Considered but Not Analyzed in Detail

Decommissioning the dam with a nonstructural alternative was analyzed and evaluated to meet the purpose and need. This alternative includes removal of the dam which would eliminate the threat of dam failure and eliminate the need to address any of the existing dam deficiencies. Nonstructural flood prevention measures would be implemented downstream for homes that would now be inundated as a result of the dam being removed. Nonstructural measures can include, but are not limited to, acquisition and demolition, relocation, and flood protection of existing structures. Flood

protection of downstream properties could include structure elevation raising, flood barriers, flood proofing, or protection by some other method. Flood proofing and buyouts were the only nonstructural alternatives considered due to the lack of feasibility for the typical structure in the area and typical public resistance associated with structure relocation, flood barriers, levees, and downgrading the dam hazard.

The Decommissioning with Non-Structural Alternative was eliminated from detailed study due to the cost and overall difficulty of floodproofing multiple structures and relocating residents and businesses downstream of the dam. This alternative eliminates the risk of a catastrophic breach wave but removes the positive effects of having the flood retarding dams, and in return still have deep flood depths downstream. The decommissioning with non-structural alternative downstream would most likely have public resistance since it would require a significant amount of property to be purchased or modified. The alternative also has significant adverse impacts on environmental, social and cultural resources. For example, the disruption to the social setting by the removal of residential properties (and associated tax base), public and institutional areas, multi-year construction impacts associated with flood proofing the transportation system (raising roads and bridges) would be significant to the population as a whole compared to the isolated construction improvements at each dam site.

INTERDISCIPLINARY PROPOSAL SCREENING

Given the nature of the proposal, the responsible official is requesting documentation to demonstrate compliance with the following legal and regulatory considerations in addition to NEPA:

- ☒ Endangered Species Act (ESA)
- ☒ National Historic Preservation Act (NHPA)
- ☒ Tribal Consultation (EO 13175)
- ☒ Clean Air Act (CAA)
- ☒ Clean Water Act (CWA)
- ☒ Pertinent Executive Orders

Special Management Areas:

- ☐ Coastal Zone Management Areas
- ☐ Conservation Easements
- ☐ Coral Reefs
- ☐ Inventoried Roadless
- ☐ Marine Sanctuaries
- ☐ National Recreation Areas
- ☐ National Scenic & Historic Trails
- ☐ Research or Experimental Areas

☐ Wild & Scenic River
Corridors

☐ Wilderness

☐ Other: [specify area type](#)

Scope of Analysis

The Study Area includes PA-463, its individual upstream floodwater retention pool, and the breach inundation area of the dam site to Creek Road. A map illustrating the Study Area is included in the Appendix. The watershed for PA-463 is located in the north central section of Barrett Township, Monroe County, PA. As described herein, the watersheds are largely undeveloped, forested regions of the county. The Skytop community, state highway PA-390 and a small airport are examples of low impact development in the area.

PL 83-566 projects are bounded in scope by the size of the watershed area, characteristics of the benefitted area, and size of potential measures considered. The PA-463 watershed is about 4,165 acres, which is less than the maximum area of 250,000 acres. About 60 percent of the watershed land use is rural, which exceeds the minimum 20 percent of benefits provided directly related to agriculture, which includes rural communities with populations less than 50,000 people. A Watershed Project Map is included in the Appendix.

Agencies and Persons Consulted

Given the nature of the proposal, the responsible official consulted the following agencies, organizations, tribes, and persons during development and analysis of the proposal:

Agencies/Organizations/Businesses/Landowners

<i>Entity</i>	<i>Association</i>
Barrett Township	Local
Monroe County Commissioners	Local
Monroe County Planning Commission	Local
Monroe County Conservation District	Local
Monroe County Office of Emergency Management	Local
Pike County Commissioners	Local
Landowners potentially impacted by construction or breach	Local
PA Department of Agriculture	State
PA Department of Environmental Protection (PADEP)	State
PADEP Division of Dam Safety	State
PADEP Federal Flood Protection Program	State
PA Department of Conservation and Natural Resources (DCNR)	State
DCNR Bureau of Forestry, District 19-Delaware	State
DCNR Bureau of Recreation and Conservation	State
PA State Conservation Commission	State
PA Department of Transportation	State
PA Emergency Management Agency	State

PA Fish and Boat Commission	State
PA Historical and Museum Commission State Historical Preservation Office (SHPO)	State
PA Game Commission	State
State Elected Officials	State
U.S. Department of Agriculture (USDA) Farm Service Agency	Federal
USDA Rural Development	Federal
U.S. Army Corps of Engineers	Federal
U.S. Fish and Wildlife Service	Federal
U.S. Environmental Protection Agency	Federal
U.S. Forest Service	Federal
U.S. Geological Survey	Federal
Federal Emergency Management Agency (FEMA)	Federal
National Oceanic and Atmospheric Administration (NOAA)	Federal
Federal Elected Officials	Federal
Absentee Shawnee Tribe of Indians of Oklahoma	Tribal
Delaware Tribe of Indians	Tribal
Delaware Nation	Tribal
Eastern Shawnee Tribe of Oklahoma	Tribal
Onondaga Nation	Tribal
Seneca-Cayuga Nation	Tribal
Shawnee Tribe	Tribal
Stockbridge-Munsee Community	Tribal

Documents

Coordination and consultation documents can be found in Appendix A of the Supplemental Watershed Plan #3 for Rehabilitation of Floodwater Retarding Structure PA-463 (Leavitt Branch Dam) of the Brodhead Creek Watershed, Monroe County, Pennsylvania.

Substantive Issues Considered for Analysis

A summary of the resources concerns, and ecosystem services identified as relevant to the project during the scoping meeting for the Brodhead Creek Watershed dam site PA-463 is presented in Table 1. Those resource items and ecosystem services marked “Yes” fall under one of the following categories:

- a) Likely to be impacted by the alternatives evaluated in this plan.
- b) NRCS policy requires evaluation.
- c) Executive Order or Environmental Law requires evaluation.

Table 1. Resource Categories of Concern Identified during Scoping

<i>Item / Concern</i>	<i>Relevant to Proposed Action</i>	<i>Rationale</i>
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Soil-Related Concerns		
Soil Resources	Yes	Soil resources have the potential to be disturbed by construction activities.
Prime & Unique Farmland and Farmland of Statewide or Local Importance	No	While these soils are present within the downstream inundation areas, no soils will be converted to non-agricultural use as a result of the alternatives.
Erosion & Sedimentation	Yes	PA-463 does not contain significant aerated sediment accumulation and dredging is not required to achieve the required design life. However, an alternative considered has potential to cause erosion through the floodwater retention pool if the dam were to fail, as well as increase erosion and sedimentation downstream.
Water-Related Concerns		
Surface Water & Surface Water Quality	Yes	No waterbodies within the Study Area are listed as impaired. However, some alternatives may have an impact on water quality, including temperature and sediment.
Sole Source Aquifer	No	No. There are no designated Sole Source Aquifers within the project area or downstream benefit area. The project area is not located within or adjacent to a designated Sole Source Aquifer.
Groundwater & Ground Water Quality	Yes	Groundwater resources may be affected by construction activities and changes in hydrology associated with dam rehabilitation or failure. Considered under NEPA due to potential effects on water resources and public water supplies.
Floodplain Management	Yes	The project is located within a FEMA-mapped floodplain and involves a flood control structure. Subject to Executive Order 11988 (Floodplain Management) and NEPA evaluation of flood risk and floodplain impacts. Existing floodplain areas may be affected by some alternatives.
Coastal Zone Management Areas	No	The watershed is not located in a Coastal Zone Management Area as defined on the PA DEP Coastal Zone map.
Waters of the U.S., Wetlands, & Special Aquatic Sites	Yes	The floodwater retention pool, surrounding wetlands, and associated streams within the Study Area are considered Waters of the U.S. Wetlands are present at and around the dam. There are no special aquatic sites present.
Coral Reefs	No	This resource is not present in the watershed.

Regional Water Resource Plans	Yes	The 2002 Brodhead Watershed Conservation Plan includes the tributaries of Brodhead Creek, which prioritizes maintaining and improving water quality, managing natural habitat to promote biodiversity and to maintain, protect, and enhance natural systems & ensure that the historic resources of the Brodhead watershed are preserved. The 2004 Water Resources Plan for the Delaware River Basin includes the Brodhead Creek. This plan prioritizes the prevention and minimization of flood-induced loss of life and property, and protect floodplain ecology, enhancing water-based recreation in the river and its tributaries and protecting, conserving and enhancing healthy and biologically diverse riparian and aquatic ecosystems.
Wild & Scenic Rivers	No	Brodhead Creek and its tributaries are not listed as part of any wild or scenic rivers.
Plant and Animal-Related Concerns		
Endangered & Threatened Species	Yes	Federally listed species may be present within the project area. Consultation with the USFWS and review of the official IPaC identified the potential presence of several federally listed species: northern long-eared bat (<i>Myotis septentrionalis</i>) and the Indiana bat (<i>Myotis sodalis</i>), both listed as endangered; the tricolored bat (<i>Perimyotis subflavus</i>), proposed for listing as endangered; the monarch butterfly (<i>Danaus plexippus</i>), a candidate species; and the northeastern bulrush (<i>Scirpus ancistrochaetus</i>), a federally endangered plant. While no threatened or endangered species or suitable habitats were observed at the dam site itself during field surveys, areas downstream were not field-verified and may contain habitat suitable for these species. There are no state-listed endangered or threatened species currently known within the Study Area.
Migratory Bird Treaty Act	Yes	The project area provides potential habitat for migratory bird species; therefore, compliance with the MBTA and evaluation under NEPA are required.
Bald and Golden Eagles	Yes	The potential presence of these species within the watershed requires consideration under NEPA and coordination with USFWS.
Essential Fish Habitat	No	No EFH was identified within the project watershed.

Ecologically Critical Areas	No	There are no critical habitats, including IBAs, within the Study Area.
Invasive Species	Yes	The reconnaissance survey for the dam sites identified the presence of invasive species including, but not limited to, multiflora rose, Japanese barberry, autumn olive, and garlic mustard. Construction activities have the potential to introduce or spread invasive species.
Fish, Wildlife & Aquatic Resources	Yes	Fish and wildlife resources may be affected by changes in hydrology, habitat conditions, or construction activities.
Natural Areas	No	There are no natural areas within the area of the PA-463 dam site.
Riparian Areas	Yes	Riparian areas are present located along the edge of the floodwater retention pool of the dam as well as along the streams entering and exiting the pools and downstream of PA-463.
Forest Resources	Yes	Forested areas are present within the project area and may be affected by construction activities.
Human Use-Related Concerns		
Cultural Resources and Tribal Consultation	Yes	NRCS defined the Area of Potential Effects (APE), identified historic properties within the APE, in accordance with 36 CFR §§ 800.3 and 800.4. The Phase I investigation identified 13 above-ground historic resources within the APE. Federally recognized Tribes contacted included the Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Onondaga Nation, Seneca-Cayuga Nation, Shawnee Tribe, and the Stockbridge-Munsee Community.
Social Issues	No	Potential alternatives will not have impacts on social issues.
Local, Regional & National Economy	Yes	Some alternatives may impact the local and regional economy.
Public Health & Safety	Yes	The dam is classified as a high hazard structure. Potential failure presents a risk to human life and safety, requiring evaluation under NEPA and NRCS dam safety policy (NWPM 505).
Scenic Beauty	No	There are no formally designated areas of scenic beauty within the Study Area. Due to topography and vegetation, PA-463 is not significantly visible outside of the immediate area.

Parklands	No	The PA-463 dam has no adjacent public recreational facilities.
Significant Scientific Resources	No	No designated or recognized scientific resources, as defined under NRCS policy (190 NCHP 601.70), were identified within the project area.
Land Use & Land Cover	Yes	Land use and land cover may be affected by implementation of project alternatives.
Other Concerns		
Transportation	Yes	Temporary impacts may occur due to construction vehicle ingress and egress to the dam site, which will be managed by requiring the contractor to implement a proper Traffic Control Plan. Dam failure will result in increased flood impacts on existing transportation infrastructure.
Maintenance and Management	Yes	There is a level of effort required by the sponsors to operate and maintain the dam.

ENVIRONMENTAL REVIEW & CONSULTATION

The following documents compliance with the National Environmental Policy Act (NEPA) and other relevant environmental laws, executive orders, and regulations.

NEPA: Consideration of Reasonably Foreseeable Impacts

Potentially Affected Environment

Soil Resources

Based on a custom soil resource report generated by the NRCS Web Soil Survey on January 3, 2024, the primary soil types at each dam site were identified, along with those within the downstream area modeled without the dams in place. These soils are detailed in Table 2 and Table 3, and a soil map is provided in Appendix C of the Watershed Plan.

Additionally, according to the PA DEP Environmental Search Tool, it was confirmed that there are no permitted activities, known contamination, or documented violations of environmental laws administered by PA DEP within the Study Area.

Table 2. Soils at PA-463, Dam Site and Floodwater Retention Pool

MUSYM	Map Unit Name	Acres	%
As	Alluvial land	18.3	28.90

LBE	Lackawanna and Bath soils, steep, rubbly	18.4	29.10
LbB	Lackawanna channery loam, 0 to 8 percent slopes, extremely stony	1	1.60
LbC	Lackawanna channery loam, 8 to 25 percent slopes, rubbly	0.5	0.70
LyE	Lordstown and Oquaga channery loams, 25 to 70 percent slopes, extremely stony	10.3	16.40
MoB	Morris channery silt loam, 0 to 8 percent slopes, extremely stony	0.1	0.20
OxC	Oquaga-Lackawanna complex, 8 to 25 percent slopes, extremely stony	1.5	2.30
WyB	Wyoming gravelly sandy loam, 3 to 8 percent slopes	6.6	10.50
WyE	Wyoming gravelly sandy loam, 25 to 70 percent slopes	4	6.40
WpB	Wellsboro channery loam, 0 to 8 percent slopes, extremely stony	2.5	3.90
PA-463 Dam Site & Floodwater Retention Pool Total		63.3	100%

Source: Web Soil Survey, 2024, United States Department of Agriculture Natural Resource Conservation Service

Table 3. Soils in the Decommissioned PA-463 Downstream 100-Year Floodplain

MUSYM	Map Unit Name	Acres	%
As	Alluvial land	10.4	45.70
LbE	Lackawanna and Bath soils, steep, rubbly	0	0.00
OxC	Oquaga-Lackawanna complex, 8 to 25 percent slopes, extremely stony	0.3	1.40
Po	Pope silt loam	7.7	33.90
Pp	Pope silt loam, high bottom	1.3	5.70
WyE	Wyoming gravelly sandy loam, 25 to 70 percent slopes	1.8	7.70
LyE	Lordstown and Oquaga channery loams, 25 to 70 percent slopes, extremely stony	1.3	5.60
PA-463 100-Year Decommissioned Floodplain Total		22.7	100%

Source: Web Soil Survey, 2024, United States Department of Agriculture Natural Resource Conservation Service

Erosion & Sedimentation

Due to the drain being continually open at the dam, PA-463 traps limited sediment. Sediment is primarily trapped during periods of high flows when a pool is present behind

the dam as a result of storm events. The historical rate of sediment deposition is 0.042 ac-ft/year.

Water Resources

PA-463 is located on the Leavitt Tributary, approximately 1-mile upstream from the confluence with the Middle Branch of Brodhead Creek. It has a drainage area is 6.51 sq. mi and a floodwater retention area of 45.1 acres.

Water Quantity

There have been 6 FEMA disaster declarations related to flooding for Monroe County from 1955-2024 (FEMA, 2024). According to the Monroe County Hazard Mitigation Plan (2021) the risk factor for flooding and levee failure is “low.” In Canadensis, this is largely due to the presence of the existing dam system. PA-463 was constructed in response to severe flooding and damage from a weather event in August 1955.

Water Quality, including Surface and Ground Water

According to the 2024 Integrated Water Quality report, PA-463 is not included in the 2022 report of Section 303(d) listed impaired waters. The surface waters are usable for crop production and recreation.

Based on information available through the Pennsylvania DEP eMap PA GIS platform, there are fifteen Public Water Systems located within a one-mile radius of PA-463. The groundwater source supplying the public water systems may be from a shallow aquifer located within the unconsolidated soils near the site or from a deeper bedrock aquifer originating in fractured rock beneath the project area. The systems are likely regulated as Transient Non-Community Water Systems and include uses such as camps, lodges, churches and restaurants.

Floodplain Management

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), Panels 42089C0109E and 42089C0128E (effective May 2, 2013, the area surrounding PA-463 and the majority of the downstream Affected Environment are designated as areas of minimal flooding, Zone X (Watershed Plan Appendix C).

Development within the 100-year floodplain is governed by Section 265 of Barrett Township’s Code of Regulations, adopted in 2013. Within the Affected Environment, floodplain mapping is limited primarily to areas in and around Canadensis. New development is permitted within the FEMA-designated floodplain, provided it is elevated at least one foot above the base flood elevation where such elevations are available. In areas lacking base flood elevation data, provisions are in place to determine appropriate building heights. However, new construction is strictly prohibited within the designated floodway.

Waters of the U.S., Wetlands & Special Aquatic Sites

Waters of the United States regulated under Section 10 and Section 404 of the Clean Water Act, includes intermittent and permanent streams, ponds, lakes (up to their ordinary high-water elevations), and most wetlands. At PA-463, the retarding pool, all

intermittent and permanent streams, and wetlands are identified in Appendix D of the Watershed Plan.

Wetlands

A wetland and waterway site investigation were performed on June 6 and 7, 2022 at the PA-463 site. A total of five wetland areas were identified and located in the field. Wetlands identified and located in the field are summarized in Table 5 and shown in Figure 1. Additional wetland descriptions, including dominant vegetation and primary functions are provided, following Table 5.

Table 4. PA-463 Wetland Classification

Wetland ID	NWI Classification	Acreage
PA-463 (Leavitt Branch Dam Site)		
A	PEM ¹ /PSS	0.22
B	PEM	0.05
C	PEM/PSS	0.36
D	PEM/PSS	0.13
E	PFO	0.09

¹ NWI wetland classifications are as follows: PEM: Palustrine Emergent; PSS: Palustrine Scrub-Shrub; PFO: Palustrine Forested

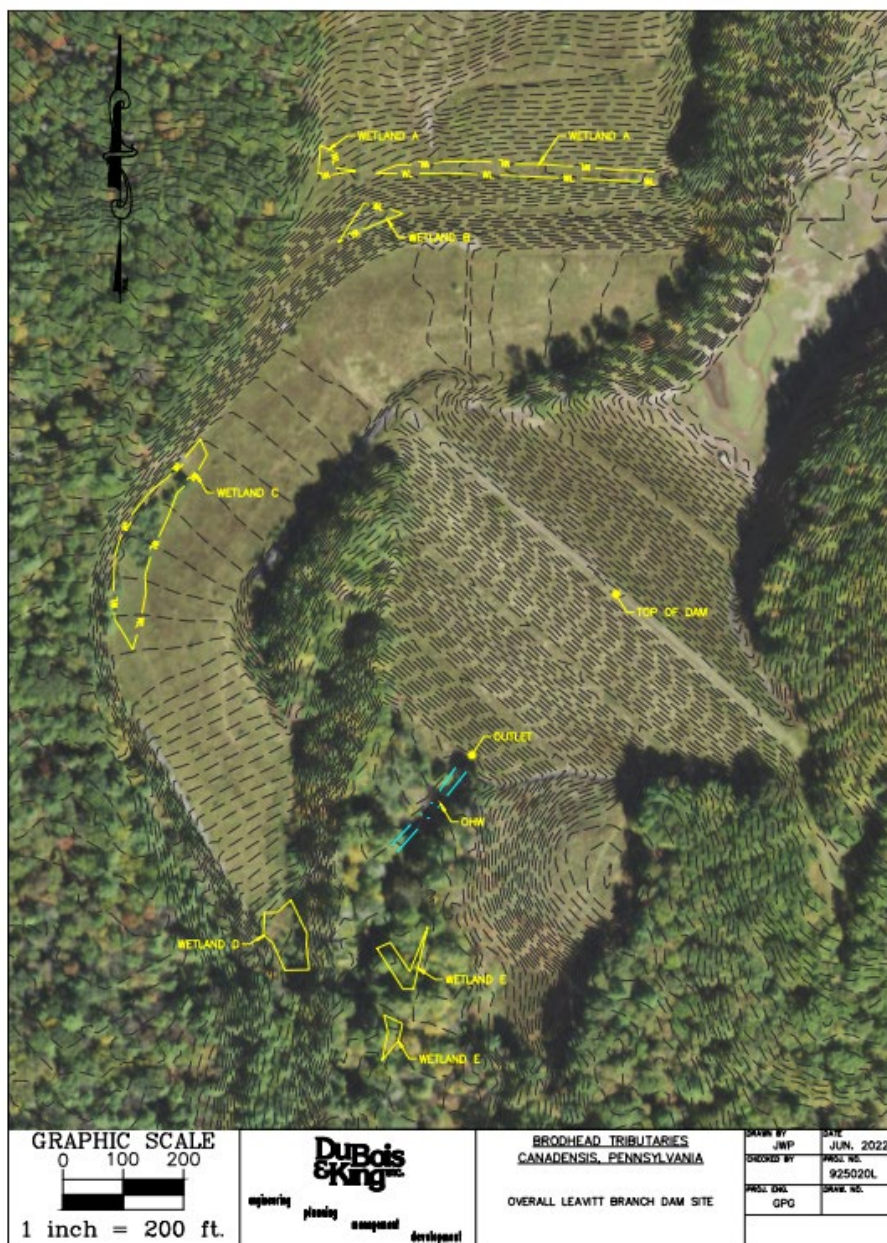


Figure 1. PA-463 Wetlands Map

Wetland A is a PEM/PSS and is a linear feature located just north of a berm above the spillway. The wetland is dominated by soft rush (*Juncus effusus*), sedges (*Carex spp.*), meadowsweet (*Spiraea sp.*), rough-stemmed goldenrod (*Solidago rugosa*), and sensitive fern (*Onoclea sensibilis*). The principal function of this wetland is sediment/nutrient retention; it likely captures runoff flowing down the steep slope above the spillway.

Wetland B is PEM and is a stand of non-native common reed (*Phragmites australis*) perched in a break in the slope above the spillway. The wetland is dominated by common reed, with some scattered sensitive fern at its edges. The principal function of

this wetland is sediment/nutrient retention, though this function is likely minimal considering the size of the wetland.

Wetland C is a PEM/PSS wetland located along the toe of slope at the western edge of the spillway. The wetland is dominated by large willow shrubs (the size of small trees) (*Salix sp.*), soft rush, drooping sedge, and rough-stemmed goldenrod. The principal function of this wetland is wildlife habitat.

Wetland D is PEM/PSS and is located at the bottom of the spillway. The wetland is dominated by cattails (*Typha spp.*), sensitive fern, sedges, and willows, and it includes a small area of open water. The principal function of this wetland is wildlife habitat; it may serve as breeding habitat for amphibians in the spring.

Wetland E is a PFO and is located in a flat, mucky area east of the outlet stream. This wetland is dominated by jewelweed (*Impatiens spp.*), sensitive fern, eastern hemlock (*Tsuga canadensis*) and red maple (*Acer rubrum*) and is apparently fed by groundwater seepage. The principal function of this wetland is groundwater recharge.

The existence of the dam and its pool area are fundamental to the presents of these wetlands. The wetlands provide good natural diversity and provide high functioning and positive effects to plants and wildlife.

Waterways

The ordinary high-water mark (OHW) of the perennial stream at the outlet of the PA-463 dam (Leavitt Branch) was identified and field-verified during the site investigation. Leavitt Branch is a second-order tributary to the Middle Branch of Brodhead Creek and flows for approximately 1 mile from the dam outlet before joining the Middle Branch. From that confluence, water ultimately flows into Brodhead Creek, which is part of the Delaware River Basin.

Downstream of the dam, Leavitt Branch and its tributaries are considered Waters of the United States (WOTUS) under Section 404 of the Clean Water Act due to their perennial flow and surface connectivity to downstream navigable waters. The stream is designated as a High-Quality Cold-Water Fishery (HQ-CWF) under Pennsylvania's Chapter 93 Water Quality Standards, indicating elevated ecological value and the presence of naturally reproducing trout populations. The dam does not alter the Chapter 93 designation of Leavitt Branch; the HQ-CWF use applies to the full stream segment as listed in PADEP's Stream Designations by Basin. According to Pennsylvania's 2024 Integrated Water Quality Monitoring and Assessment Report, Leavitt Branch is attaining all designated uses both above and below the dam, with no recorded impairments. Therefore, the reservoir and dam structure are not currently impacting the designated aquatic life use of the stream.

These downstream waters, including riparian and wetland features, are considered jurisdictional and functionally connected to the broader aquatic ecosystem of the Brodhead watershed. They provide regulating ecosystem services benefits by intact natural stream systems, which include aquatic vegetation, wetlands, and bivalves within these systems that filter flowing water, remove harmful contaminants, and improve habitat quality for sensitive freshwater species. Additionally, wetlands and aquatic

vegetation also serve to naturally attenuate flood flows by slowing runoff and absorbing excess water. They provide clean water for recreational fishing, boating, and swimming. The waters also contribute to the natural aesthetics of the area.

Regional Water Resource Plans

Monroe County's Hazard Mitigation Plan (2021) aims to reduce loss of life and property by addressing key risks, including flooding, one of the most frequent and costly hazards in the region. The 2021 plan update, developed with input from local officials, residents, and stakeholders, identifies flooding, flash flooding, and ice jam flooding as priority concerns. Many municipalities, particularly those along the Delaware and Lehigh Rivers, face recurring flood events that threaten infrastructure, disrupt transportation, and pose environmental risks, including hazardous material contamination.

To mitigate these impacts, Monroe County has established clear goals over the next five years, focusing on reducing flood-related damage, improving disaster response, promoting flood-resilient development, and protecting critical infrastructure. The county's commitment to hazard mitigation planning helps break the cycle of disaster damage and supports long-term community resilience.

The 2002 Brodhead Watershed Conservation Plan identifies concerns within the watershed that include (but are not limited to) the impacts of unplanned growth, stormwater runoff, development of wetlands and stream bank erosion. Leavitt Branch (PA-463) was identified in the Plan as one of the watershed's "special places." Goals that are directly relevant to this Watershed Assessment include the following:

- "Water Quality and Quantity: Maintain and improve water quality throughout the watershed and ensure that an adequate quantity of surface water and groundwater is maintained."
- "Fish and Wildlife Habitat – Manage natural habitat to promote biodiversity and to maintain, protect, and enhance natural systems."
- "Historic & Cultural Resources – Ensure that the historic resources of the Brodhead watershed are preserved and interpreted as educational examples of the area's heritage."

Brodhead Creek and its tributaries are part of the Delaware River Basin. The 2004 Water Resources Plan for the Delaware River Basin is a multi-state plan that outlines a unified vision for protecting, preserving and enhancing the Delaware River Basin. Plan goals that are relevant to this project include (but are not limited to):

- "Goal 2.1: Prevent or minimize flood-induced loss of life and property and protect floodplain ecology. Identifying areas and structures within a community that are at risk from flooding is the single most important step in mitigating future flood damage and loss. Community planning to reduce flood damage is critical, and guidance is available from federal and state agencies to help communities in this effort. In addition, flood forecasting and warning, maintenance of flood control structures, and stormwater management are all essential elements of controlling future flood damage."
- "Goal 2.2: Enhance water-based recreation in the river and its tributaries. The

Basin's National Wild and Scenic Rivers, the Appalachian Trail, and numerous game lands, parks and forests can be linked to optimize recreational experiences."

- "Goal 2.3: Protect, conserve and restore healthy and biologically diverse riparian and aquatic ecosystems. The health of plant and animal communities requires that flows in rivers and streams exhibit the natural range of variation in the flow regime, especially seasonally. Other physical and chemical parameters are also critical to the health of ecosystems. Understanding the range of needs for the diverse native aquatic and riparian populations within the Basin is a major challenge."

Endangered and Threatened Species

A review of endangered and threatened species within the Study Area of the PA-463 dam site was conducted using the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database. The IPaC review identified the potential presence of several federally listed species within the broader Study Area, including the northern long-eared bat (*Myotis septentrionalis*) and the Indiana bat (*Myotis sodalis*), both listed as endangered; the tricolored bat (*Perimyotis subflavus*), proposed for listing as endangered; the monarch butterfly (*Danaus plexippus*), a candidate species; and the northeastern bulrush (*Scirpus ancistrochaetus*), a federally endangered plant (See Watershed Plan Appendix A). The IPaC database did not identify any designated critical habitat within the Study Area of the project site.

Field investigations conducted in 2022 confirmed that there are no known occurrences or suitable habitat for these species within the immediate dam footprint, and no critical habitat is present at the PA-463 site. However, areas downstream of the dam within the breach inundation zone and expanded 100-year floodplain were not field-verified as part of this assessment. While no critical habitat has been mapped in these areas, downstream riparian corridors, floodplain wetlands, and forested areas may contain suitable habitats for some of the listed species during portions of their life cycles.

A Pennsylvania Natural Diversity Inventory (PNDI) review of the approximate Study Area was conducted on June 14, 2024. This was supplemented with a desktop review using the Pennsylvania Natural Heritage Program (PNHP) Conservation Explorer tool. Results from the PNDI review and desktop analysis are outlined below and contained in Appendix A of the Watershed Plan.

- PA Game Commission - lists no Threatened or Endangered Species or Species of Special Concern.
- PA Fish & Boat Commission: Indicates no Threatened or Endangered Species in the vicinity. The PNDI search results note that the project may lie within the occupied range of the timber rattlesnake (*Crotalus horridus*) and include recommendations for avoiding disturbance of critical habitat and minimizing risks during construction. However, according to the PA Conservation Explorer, the timber rattlesnake's Dutch Hill habitat is located west of the Study Area.
- PA DCNR: Identifies the presence of a threatened plant species, the white

twisted-stalk (*Streptopus amplexifolius*). However, the PA Conservation Explorer indicates that the plant is located outside the Study Area.

- USFWS: indicates no impacts (NLAA) to federally listed or proposed species are anticipated. Results of the USFWS IPaC and PNDI are included in Watershed Plan Appendix A and summarized in Table 6, below.

Field surveys conducted in the area did not observe any rare, threatened, or endangered species or significant natural communities. No potential bat roost trees were identified, and the PA-463 site is not mapped as core habitat due to human influence, including regular mowing of the area.

Table 5. Species and Resources potentially impacted by activities in the Brodhead Creek Watershed
Final PNDI dated July 9, 2024 and USFWS IPaC dated 5/29/24. State ranks: 1=Critically Imperiled; 2=Imperiled;

Species/Habitat	Ranking		Present in Study Area/ Breach Area
State (DCNR) Species	State	Federal	
White twisted-stalk (<i>Streptopus amplexifolius</i>)	Critically Imperiled (S1)	N/A	No but present in watershed
USFWS Species			
Indiana bat (<i>Myotis sodalis</i>)	Endangered	Endangered	Potentially
Northern long-eared bat (<i>Myotis septentrionalis</i>)	Endangered	Endangered	Potentially
Tricolored bat (<i>Perimyotis subflavus</i>)	Endangered	Proposed Endangered	Potentially
Monarch butterfly (<i>Danaus plexippus</i>)	N/A	Candidate	Potentially
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	Endangered	Endangered	Potentially

3=Vulnerable; 4=Apparently Secure; 5=Secure.

Migratory Birds

The Study Area contains valuable habitat for a diversity of wildlife species. Migratory birds likely utilize the diversity of upland and wetland habitats present in the watershed,

including "birds of conservation concern" (BCC) identified in the IPaC report, such as wood thrush (*Hylocichla mustelina*), black-capped chickadee (*Poecile atricapillus*), bobolink (*Dolichonyx oryzivorus*), black-billed cuckoo (*Coccyzus erythrophthalmus*), Canada warbler (*Cardellina canadensis*), cerulean warbler (*Setophaga cerulea*), prairie warbler (*Setophaga discolor*), golden-winged warbler (*Vermivora chrysoptera*), northern saw-whet owl (*Aegolius acadicus*), rusty blackbird (*Euphagus carolinus*), chimney swift (*Chaetura pelagica*), and eastern whip-poor-will (*Antrostomus vociferous*). (Watershed Plan Appendix A).

The forested and shrub-scrub wetlands throughout the Study Area provide cover and foraging habitat for migratory birds such as common yellowthroat (*Geothlypis trichas*), ruby-crowned kinglet (*Corthylio calendula*), and yellow warbler (*Setophaga petechia*) (Smith, 2005).

Bald and Golden Eagles

A review of the USFWS IPaC database (Watershed Plan Appendix A) identified the potential presence of the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) within the Study Area. Both species are protected under the Bald and Golden Eagle Protection Act (BGEPA). According to the Pennsylvania Game Commission's Bald Eagle Nest Survey, no bald eagle or golden eagle nests are located within the project footprint, including the dam, floodwater retention area, or breach inundation area. The nearest known bald eagle nest is located approximately 1.8 miles downstream and outside of the breach inundation zone. No nests have been documented within the vicinity that would trigger seasonal restrictions for construction or tree clearing activities.

The Study Area includes fragmented forest and partially developed areas that may provide potential foraging or perching habitat, but the lack of nesting sites within or adjacent to the construction or breach impact zones indicates that no direct impacts to nesting eagles are anticipated. Therefore, time-of-year restrictions related to active eagle nests are not expected to apply.

Invasive Species

Based on observations during the wetlands and waterway site investigation on June 6 and 7, 2022, common non-native invasive species within the Leavitt Branch Dam project study area included European honeysuckle (*Lonicera spp.*), autumn olive, multiflora rose, Japanese barberry, and oriental bittersweet. Garlic mustard was common in the forested areas across the site. During stakeholder meetings, the Monroe County Conservation District noted that an excessive amount of autumn olive and Japanese barberry are present at PA-463, which they would like to see removed.

Fish and Wildlife

The forested areas along Leavitt Branch and its tributaries serve as travel corridors for mammals such as bobcat (*Lynx rufus*), American black bear (*Ursus americanus*), and white-tailed deer (*Odocoileus virginianus*). Wildlife habitats in the project area consist of open grasslands near PA-463, as well as shrublands and forested areas in the surrounding regions.

Aquatic habitats include the stream flowing into and out of the dam. Common species that may inhabit these environments include beaver (*Castor canadensis*), eastern cottontail (*Sylvilagus floridanus*), coyote (*Canis latrans*), grey fox (*Urocyon cinereoargenteus*), squirrels (*Sciuridae*), raccoon (*Procyon lotor*), North American porcupine (*Erethizon dorsatum*), weasels (*Mustelidae*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), mice (*Muridae spp.*), voles (*Cricetidae spp.*), white-tailed deer (*Odocoileus virginianus*), and various songbirds, raptors, fish (including native brook trout, *Salvelinus fontinalis*), turtles, and snakes.

Leavitt Branch supports a variety of fish species, including bluegill (*Lepomis macrochirus*), chain pickerel ([*Esox niger*](#)), yellow perch (*Perca flavescens*), rock bass (*Ambloplites rupestris*), striped bass (*Morone saxatilis*), and redbreast sunfish (*Lepomis auritus*). The stream is also recognized for its natural trout production. Tributaries of Brodhead Creek are classified as High-Quality Cold-Water Fisheries under Title 25, Chapter 93 of Pennsylvania's Water Quality Standards. This designation requires maintaining water quality levels sufficient to protect cold water fish species, including members of the family Salmonidae, such as brook trout, as well as other flora and fauna native to cold water habitats. While High Quality streams are afforded less regulatory protection in permit reviews than Exceptional Value Waters, their ecological integrity must still be preserved. According to the Pennsylvania Natural Heritage Program Conservation Explorer, Leavitt Branch supports natural trout reproduction, further emphasizing its ecological significance.

Riparian Areas

At PA-463 (Leavitt Branch Dam) riparian areas are present along the perimeter of the existing floodwater retention pool and along the channels of Leavitt Branch both upstream and downstream of the dam. Upstream and around the pool, riparian zones are dominated by wetland vegetation and extend approximately 0.1 to 0.2 miles along the edge of the impoundment, varying in width from 25 to 100 feet depending on slope and vegetative cover.

Along the stream reaches entering and exiting the floodwater retention pool, riparian areas are located primarily along the immediate streambanks, where periodic flooding supports moisture-tolerant vegetation and promotes floodplain function. These riparian zones provide sediment filtration, nutrient uptake, and habitat connectivity. They function to support wildlife, species of plants, and other organisms. Value is slightly diminished due to presence of invasives.

A desktop GIS review of the downstream breach inundation area—based on topography, hydric soils, and land cover—indicates that riparian areas extend intermittently for approximately 2.3 miles along Leavitt Branch downstream of the dam, primarily within low-gradient floodplain areas.

Forest Resources

The forest resources observed at PA-463 during field investigations include a swath of woods dominated by white oak, chestnut oak, hemlock and white pine. West of the inlet to the dam, open water meets a steep, well-drained slope, dominated by American

beech, red oak, red maple, and hemlock, with an understory of American beech saplings.

Forests within the Study Area provide firewood, habitat, and recreational opportunities.

Cultural Resources and Tribal Consultation

A Phase I Cultural Resources Investigation was conducted within the Area of Potential Effects (APE) in accordance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800). The investigation included identification and evaluation of archaeological sites as well as above-ground historic resources, including buildings, structures, objects, and potential historic districts, consistent with the definition of historic properties provided in 36 CFR 800.16(l). Methods included background research, agency file review, and field survey to identify cultural resources within the APE.

NRCS evaluated all identified cultural resources within the APE for eligibility for listing in the National Register of Historic Places (NRHP) in consultation with the Pennsylvania State Historic Preservation Office (PA SHPO) and consulting Tribes including the Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Seneca-Cayuga Nation, Shawnee Tribe, Onondaga Nation, and the Stockbridge-Munsee Community, and Band of Mohican Indians, in accordance with 36 CFR 800.4(c). These determinations, and the basis for those determinations, are documented in the Phase I Cultural Resources Report (Watershed Plan Appendix E) and supporting consultation correspondence (Watershed Plan Appendix A), consistent with documentation requirements under 36 CFR 800.11.

The Phase I investigation identified 13 above-ground historic resources within the APE. These resources were evaluated for NRHP eligibility using the criteria set forth in 36 CFR 60.4. In addition, 22 resources associated with the Skytop Resort were surveyed and evaluated as a potential historic district. Of these, a portion were identified as contributing elements to the district based on their architectural and historical significance.

Archaeological investigations identified areas of high and moderate pre-contact sensitivity within the APE. However, these areas are located outside of the anticipated limits of disturbance (LOD) and portions of the APE have been previously disturbed by initial dam construction and subsequent floodwater inundation.

The Leavitt Branch Dam (PA-463) was also evaluated for NRHP eligibility. Based on its design, materials, and lack of association with significant historical events or persons, NRCS determined that the dam is not eligible for listing in the NRHP.

Local, Regional and National Economy

Barrett Township, located near more populous areas of Monroe County, is known for its resort communities and tourist destinations. The predominant land uses in the township are forested land and public open space, followed by commercial areas, particularly resorts and hotels. A significant portion of the township falls within the resort district. Monroe County's economy is heavily reliant on recreation and tourism, though

industries such as manufacturing, logistics, electronics, and pharmaceuticals also play a substantial role. Major employers in the county include Tobyhanna Army Depot, Sanofi, Lehigh Valley Hospital, and the Walmart distribution center.

According to the 2022 ACS 5-year estimates, Barrett Township's median household income is \$84,974 (in 2022 dollars), which is 5% higher than the median income for Monroe County. It also exceeds the median household income for Pennsylvania and the United States by 16% and 13%, respectively. The median value of owner-occupied housing in Barrett Township is \$241,100, which is higher than the state median of \$226,200 but lower than the national median of \$281,900. In comparison, Monroe County's median housing value is \$221,100.

Approximately 12.5% of Barrett Township residents live in poverty, slightly above the poverty rates for Monroe County (11.3%) and Pennsylvania (11.8%). The township's racial composition is 73.1% White alone, 4.9% African American, 0.1% American Indian and Alaska Native, 15.8% identifying as two or more races, 23% Hispanic, and 7.3% Asian. Barrett Township has higher percentages of Hispanic, multiracial, and Asian populations compared to both Pennsylvania and national averages.

Public Health and Safety

The PA-463 dam was constructed for the purposes of flood control; however, the reservoir and surrounding areas also provide passive recreational opportunities to local residents. PA-463 is classified as High Hazard Potential dam under USDA NRCS standards.

PA-463 provides flood mitigation benefits for downstream areas. This mitigation prevents potential damage to human use, health or safety due to extreme flooding events. In addition, reduced flooding minimizes the potential for health impacts and disease, which can increase as a result of flood events – particularly among at-risk populations. Property values are adversely impacted by flooding. Studies have shown that typically, the market value of a house within a floodplain can be as much as 3.5 to 12.2 percent less than houses outside of the floodplain. In addition, studies have also found that homes in a higher risk flood zone see a greater decrease in sale prices than homes in a less risky flood zone (Zhang & Leonard, 2019).¹

Flooding has been shown to impact human health. A study conducted in 1974-1977 following Hurricane Agnes (1972) determined that the difference in rates of leukemia & lymphoma between areas affected by significant flooding and those that were not flooded was significant (Janerich et al., 1981).² Disasters such as hurricanes and floods can have a significant effect on the mental health of those affected, including increasing stress, anxiety, and mental illnesses. In a study conducted in 2005, researchers found that 48% of adults in flooded households experienced moderate to severe psychological

¹ Zhang, L., Leonard, T. Flood Hazards Impact on Neighborhood House Prices. J Real Estate Finan Econ 58, 656–674 (2019). <https://doi.org/10.1007/s11146-018-9664-1>

² Janerich DT, AD Stark, P Greenwald, et al. 1981. Increased leukemia, lymphoma, and spontaneous abortion in Western New York following a flood disaster. Public Health Reports 96(4): 350-356.

problems in the nine months following a flood, compared to only 12% of adults in non-flooded households (Reacher et al., 2004).³

Since PA-463 does not meet all the current federal and state dam safety design and performance standards, there is an increased risk of dam failure that would result in downstream flooding, which could greatly impact the lives, health, and essential public services such as infrastructure and emergency assistance.

Land Use

The land use and land cover of the Study Areas for PA-463 is summarized in Table 7.

Table 6. Land Use/Land Cover in PA-463's Study Area

PA 463 Land Cover Type	Acres	%
Open Water	0.66	0.7%
Developed, Open Space	4.00	4.3%
Developed, Low Intensity	1.55	1.7%
Developed, Medium Intensity	0.44	0.5%
Deciduous Forest	28.40	30.6%
Evergreen Forest	4.00	4.3%
Mixed Forest	32.69	35.2%
Shrub/Scrub	0	0
Herbaceous	4.00	4.3%
Hay/Pasture	12.45	13.4%
Woody Wetlands	3.11	3.3%
Emergent Herbaceous Wetlands	1.55	1.7%
Totals	92.85	100.00%

Source: National Land Cover Database, 2021, United States Geological Survey

³ Reacher M, K McKenzie, C Lane, T Nichols, et al. 2004. Health impacts of flooding in Lewes: a comparison of reported gastrointestinal and other illness and mental health in flooded and non-flooded households. Communicable Disease and Public Health 7(1): 39 - 46.

Land cover in the Study Area is dominated by tree canopy, hay/pasture and woody wetlands. The impervious surface is limited largely to buildings and roads. Only 6% of the Study Area is impervious, most of which is downstream of the dam structure.

Land development patterns in the Study Area are consistent with communities located in the Poconos, with diffuse residential development with higher density development clustered in villages and some adjacent resort development. Within the Study Area for PA-463, there are three zoning districts (Zoning Ordinance, Barrett Township, Monroe County, PA, 2013 – amended 2020) that define the type and allowed density of development.

Development in Barrett Township is relatively low compared to other parts of Monroe County. In 2022 there were 5 permits issued for new buildings and in 2023 there were 4.

Maintenance and Management

Several maintenance concerns were noted at PA-463, including the management of invasives and the removal of logs from dam inflows following significant storm events.

Transportation (Provisioning Ecosystem Service)

Transportation infrastructure within the study area includes PA-447 (Creek Road), which runs north-south, and is classified as a state highway, running adjacent to Brodhead Creek. Average daily traffic volume (PENNDOT, 2022) on PA-390 north of Canadensis is 1,500, and south of Canadensis is 3600. PA-463 is accessible from PA-390.

Environmental Impacts

Environmental impacts of the No Action and Structural Rehabilitation alternatives are summarized in following subsections. The No Action alternative is a required alternative that must be evaluated, representing the current conditions, with the identified problems left unaddressed and projected into the future, serves as a baseline for comparing the benefits and impacts of other alternatives. Structural Rehabilitation is the proposed action which will address identified deficiencies, restore compliance with current standards, and reduce the risk of catastrophic dam failure.

Soil Resources

No Action –Under the No Action scenario, the dam would remain in operation without rehabilitation, and minor soil disturbances may continue to occur over time due to localized erosion at the auxiliary spillway and sediment deposition within the flood retention pool. These effects are expected to be limited in scope but may worsen if the dam's structural deficiencies remain unaddressed. However, the eventual dam breach would trigger substantial scour and mass waste soils within the flood retention pool, surrounding soils, and downstream streambanks contributing to increased flooding and water quality degradation. A breach event would cause downstream aggradation of the displaced sediment. Although these impacts would be pronounced in the short term, natural river processes would eventually restore a new equilibrium over time.

Determination: There would be negligible effects on soil resources from continued dam operation; however, a dam breach would lead to direct, adverse short-term impacts on soil stability and quality.

Structural Rehabilitation Alternative – Rehabilitation construction activities would cause temporary soil disturbances through excavation, compaction, and removal of soil horizons. Best Management Practices (BMPs) in line with NRCS standards would be implemented to mitigate erosion, and all disturbed areas would be revegetated to stabilize the soils post-construction.

Determination: The alternative would have soil disturbance from construction at the dam site associated with the described rehabilitation activity and subsequent dam operations. In the short-term, effects would be direct, adverse, minor, and localized. In the long-term, effects would be direct, adverse, negligible, and localized.

Water Resources

Water Quantity

No Action – Under the No Action alternative, the structural condition of PA-463 would continue to degrade, reducing its ability to regulate water quantity. A future breach would result in the loss of floodwater storage and retention capacity, leading to higher peak flows, increased downstream discharge volumes during storm events, and reduced flow moderation during low-flow periods. This change would diminish the watershed's ability to buffer hydrologic extremes, contributing to flashier hydrographs and elevated flood risk downstream.

Determination: The No Action alternative would have negligible long-term effects on water quantity under normal conditions. However, if a dam breach occurs, there would be direct, adverse, and significant short-term impacts due to the sudden loss of floodwater storage capacity, increased downstream peak flows, and reduced baseflow regulation.

Structural Rehabilitation Alternative – Under the Structural Rehabilitation alternative, water quantity regulation would be maintained or improved. The rehabilitation would restore the dam's design function for flood attenuation, preserving the system's capacity to detain stormwater and release it in a controlled manner. This alternative would sustain flow regulation benefits for downstream ecosystems and communities, supporting floodplain health, reducing streambank erosion potential, and maintaining more stable hydrologic conditions in Leavitt Branch and its receiving waters.

Determination: The Structural Rehabilitation alternative would have beneficial long-term effects on water quantity by maintaining flood storage capacity, moderating downstream flows, and supporting consistent hydrologic conditions throughout the watershed.

Water Quality, including Surface and Ground Water

No Action – Under the No Action scenario, the continued presence of the dam has a minimal beneficial effect on downstream sedimentation by trapping deposition behind the dam during flood events. The existing dam does have an effect on water quality parameters, including temperature, dissolved oxygen, and Total Suspended Solids

(TSS), relative to free-flowing stream conditions. A dam breach would likely lead to short-term, significant increases in TSS and turbidity, degrading water quality. With respect to groundwater, the dam does not serve as a significant recharge or discharge control structure. However, a breach could result in temporary alterations to shallow groundwater-surface water interactions, especially in low-lying riparian zones. These effects would be localized and temporary, with no long-term changes in regional groundwater levels anticipated.

Determination: The No Action alternative would have negligible long-term effects under normal conditions. However, if a dam breach occurs, there would be direct, adverse, and significant short-term impacts on surface water quality and localized, temporary impacts on groundwater-surface water interactions.

Structural Rehabilitation Alternative – Rehabilitation construction activities would cause temporary disturbances that would affect water quality by increasing turbidity and TSS. These impacts would be controlled using BMPs such as cofferdams, soil stabilization, and erosion control measures.

Post-construction, the rehabilitated structure is expected to continue functioning as a dry detention dam, with water impoundment occurring only during storm events. Under normal flow conditions, the dam allows most sediment and particulates to pass through. Sediment surveys indicate a historic average sediment trapping rate of just 0.032 acre-feet per year, confirming that the reservoir has a minimal influence on long-term sediment storage. Given this low trapping rate and the lack of observed downstream channel incision to date, significant alterations to sediment continuity or channel morphology are not anticipated. Therefore, long-term impacts to downstream sediment dynamics are expected to be negligible.

Hydraulic patterns and water circulation would be temporarily affected by the use of cofferdams, but normal flows would resume post-construction. No significant long-term changes are expected in circulation or pool elevation.

Determination: The rehabilitation alternative would result in minor, localized short-term water quality impacts during construction, primarily due to ground disturbance and potential sediment mobilization. However, long-term effects would be negligible or beneficial, as the rehabilitated structure would continue to regulate downstream flows and maintain sediment control consistent with existing conditions. PA-463 currently exhibits a low sediment trapping rate of approximately 0.032 acre-feet per year, and post-rehabilitation performance is expected to remain similar, minimizing any long-term disruption to downstream sediment transport.

Floodplain Management

No Action – Eventually the structure will deteriorate and breach, causing significant impacts to human development in the floodplain. Initially, the dam breach would likely result in damage to 84 residential structures, 23 commercial buildings, 5 institutional facilities, and 12 bridges. Following the initial breach event, the absence of flood storage capacity would permanently alter downstream hydrology. Modeling indicates that the extent of the 100-year floodplain would increase from 849 acres to 1,105 acres, representing a 30% increase in floodplain area. The more than 200% increase in

downstream flood risk to structures is based on a comparison of the number of buildings exposed within the 100-year floodplain under current conditions (with the dam) versus the “without-dam” scenario. This increase is attributed to both the expanded floodplain footprint and the more frequent and severe inundation of areas previously protected by PA-463.

Determination: In the event of a dam breach, there would be significant direct, indirect, adverse, major short-term impacts from this alternative on floodplain management. Long term indirect impacts would be adverse and major.

Structural Rehabilitation Alternative – Rehabilitation of PA-463 will maintain downstream flood protection, resulting in no change to the existing 100-year floodplain and no change in floodplain function.

Determination: There would be no impact from this alternative on floodplain management.

Waters of the U.S., Wetlands, & Special Aquatic Sites

No Action – The No Action alternative would have no new effects to Waters of the U.S. (WOTUS), wetlands, and special aquatic sites under continuing operation of the dam. Any impacts associated with the original placement of the dams would remain unchanged. However, in the event of a dam breach, significant downstream impacts to WOTUS and wetlands could occur. The sudden release of impounded water would likely cause streambank erosion, sediment scouring, and the physical disruption of wetland soils and vegetation within the breach inundation zone. These impacts could degrade aquatic habitat quality, alter stream morphology, and reduce the ecological function of connected wetland systems.

Determination: There would be negligible effects on WOTUS, wetlands, and special aquatic sites associated with continued operation of the dams. However, a dam breach would have short term adverse effects on WOTUS, wetlands, and special aquatic sites.

Structural Rehabilitation Alternative – Proposed improvements to PA-463 would temporarily disturb approximately 1022 linear feet and 0.46 acres of jurisdictional streams and wetlands during construction. Permanent fill for spillway and stilling basin construction would impact an additional 970 linear feet of stream and 2.27 acres of wetlands. Wetlands affected include a mix of palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) systems, illustrated in Table 5.

These effects were reviewed and concurred with by the U.S. Army Corps of Engineers on 09/30/2024, as documented in Appendix A of the Watershed Plan (USACE Correspondence) and mapped in "Support Maps" (Appendix C).

Determination: Construction of the Rehabilitation Alternative would result in minor, short-term disturbances to approximately 480 linear feet and 0.06 acres of jurisdictional streams and wetlands, primarily consisting of palustrine emergent (PEM) and palustrine scrub-shrub (PSS) wetlands within the construction footprint. In addition, permanent fill would affect approximately 192 linear feet of stream and 0.49 acres of jurisdictional wetlands, including PEM, PSS, and a small portion of palustrine forested (PFO)

wetlands. These long-term impacts are expected to be minor in scale and will be addressed through appropriate mitigation measures in coordination with federal and state permitting agencies.

Regional Water Resource Plans

No Action – The No Action alternative does not support the objectives outlined in the 2004 Water Resources Plan for the Delaware River Basin, particularly the prevention or minimization of flood-induced loss of life and property and the protection of floodplain ecology. It also fails to address the high hazard classification of the PA-463 dam as identified in the Monroe County Hazard Mitigation Plan (2021). Inaction increases long-term risk to downstream communities and contradicts regional flood resilience and ecological preservation goals.

Determination: The No Action Alternative does not align with the goals of the 2004 Water Resources Plan for the Delaware River Basin or the Monroe County Hazard Mitigation Plan. It fails to address the dam's high hazard classification, increases downstream flood risk, and does not contribute to the protection of floodplain function or public safety. As a result, this alternative would not support the objectives of regional flood management, resilience, or ecological sustainability, and may be inconsistent with future plan updates.

Structural Rehabilitation Alternative – Rehabilitation of the dams would address the goals of the Water Resources Plan for the Delaware River Basin and Monroe County Hazard Mitigation Plan.

Determination: The rehabilitation alternative aligns with and advances the goals of both regional plans by reducing flood risk, maintaining floodplain function, and addressing the dam's high hazard status. These positive outcomes may support future updates or alignment with the Water Resources Plan and Monroe County Hazard Mitigation Plan.

Endangered and Threatened Species

No Action – Routine operation and maintenance of the dams under the No Action alternative would not affect federally listed species. However, in the event of a dam breach, there is potential for destruction of roosting habitat for bats (e.g., northern long-eared bat and Indiana bat) and disruption to habitat supporting the potentially present endangered northeastern bulrush (*Scirpus ancistrochaetus*) that may be located within the breach inundation area.

Determination: Continued dam operations would result in no effect. A dam breach, however, could cause adverse effects to listed species and habitats.

Structural Rehabilitation Alternative – Per consultation with the USFWS, the project is within the range of the endangered northern long-eared bat and Indiana bat, as well as the proposed endangered tricolored bat. The project includes removal of approximately 9.8 acres of trees during the bats' inactive season (November 1 to March 31), with approximately 3.76 acres allowed to regenerate. There were no communities identified during the site walk and based on the time-of-year construction restrictions the USFWS concurred with a "Not Likely to Adversely Affect" (NLAA) determination for the bats.

The project is also located within the broader range of the northeastern bulrush (*Scirpus ancistrochaetus*), a federally endangered plant species. Although this species is known to occur in peatlands and wetlands elsewhere in the Brodhead watershed, no records exist in the immediate vicinity of the PA-463 project area, and no individuals or suitable habitat were observed during the wetland and waterway site investigation conducted in June 2022. While the field survey was not a formal botanical inventory, it included qualitative screening for federally listed species, and no evidence of northeastern bulrush was found. Therefore, adverse effects to this species are unlikely.

Because the dam will remain in place and the proposed action does not modify downstream hydrology beyond current conditions, impacts to threatened or endangered species or their habitats in the downstream floodplain are not anticipated.

Determination: Based on avoidance measures, field observations, and agency consultation, the proposed action would result in no effect on federally listed threatened or endangered species or their habitats at or downstream of the dam.

Migratory Birds

No Action – The No Action alternative would have no effect on migratory birds under continuing operation and maintenance of the dams. A beach of the dam may have adverse effects on habitat downstream of the dam that is used by migratory birds. However, the birds can relocate to other available habitat during this condition.

Determination: There may be minor effects on migratory birds during a breach of the dam.

Structural Rehabilitation Alternative – During construction, temporary disturbances such as noise, vegetation clearing, and human activity may affect migratory birds and their nesting or foraging behavior. However, these impacts are expected to be localized and short-term. Long-term habitat availability may be slightly altered but is not expected to significantly reduce the overall suitability of the area for migratory birds. USFWS suggested minimizing the risk of take to migratory birds by choosing to remove trees when birds are unlikely to be nesting (tree removal recommended between September 1 and March 31). A determination of “Not Likely to Adversely Affect” (NLAA) has been received from the USFWS (Watershed Plan Appendix A).

Determination: There would be minor short-term effects to migratory bird habitat.

Bald and Golden Eagles

No Action – The No Action alternative would have no effect on eagles under continuing operation of the dams as there are no known eagle nests within the immediate project area, and no occurrences were identified during the PNDI environmental review or during field observations.

In the event of a dam breach, the sudden loss of the Leavitt Branch impoundment would alter aquatic and riparian habitat conditions within the project area. The elimination of the floodwater retention pool could reduce local habitat suitability for foraging bald eagles. These effects would be indirect and minor in scale, given the minimal amount of time a pool is present and absence of confirmed nest sites in the action area.

Golden eagles are unlikely to be affected, as they are primarily observed in Pennsylvania during migration and are not known to nest or forage in the project vicinity.

Determination: Continued dam operation would have no effect on bald or golden eagles. However, a dam breach could result in minor, long-term adverse effects on foraging habitat for bald eagles due to the loss of the floodwater retention pool and associated limited prey base.

Structural Rehabilitation Alternative – Based on the most recent information from USFWS on active eagle nest locations there are no nest in the immediate vicinity. It is unlikely that bald or golden eagles would be present in the immediate project area during construction. However, if an eagle nest is discovered during construction and within nesting season, all activities will be halted immediately, and consultation with the USFWS and appropriate wildlife biologists will be initiated to ensure compliance with protection measures.

Determination: There would be no long-term effect on bald or golden eagles.

Invasive Species

No Action – The No Action alternative would have no effect on invasive species under continuing operation and maintenance of the dams. However, a dam breach would potentially spread existing invasive species to areas downstream and outside of their existing locations.

Determination: There would be minor long-term effects on invasive species.

Structural Rehabilitation Alternative – The incorporation of BMPs into the construction documents for compliance by the contractor will provide for the control of spread of invasive species. BMPs would include: 1) use of equipment and construction / timber mats that are thoroughly cleaned prior to mobilization to the site and prior to demobilization, 2) cleaning construction equipment before moving to a new site to minimize the risk of transporting seeds or propagules, 3) proper disposal of excavated or dredged material, 4) disposal of excavated and dredged material in pre-approved, non-wetland areas, 5) provide training or personnel with knowledge of identification of invasive species; 6) applying control treatments prior to construction and monitoring during and after construction.

Determination: There would be no long-term adverse effects on invasive species.

Fish & Wildlife

No Action – The alternative would have no effect on fish and wildlife under continuing operation of the dam. Terrestrial and aquatic habitats would remain relatively undisturbed. Existing fish and wildlife in these areas would likely continue to be present under current conditions. However, if a dam breach were to occur, fish and wildlife would be affected by short term negative changes to habitat from erosion, sedimentation, and turbidity within the streams.

Determination: There would be negligible effects from ongoing operation of the dam. If a dam breach were to occur, there would be long-term minor effects on fish and wildlife.

Structural Rehabilitation Alternative – Construction activities related to rehabilitation of the dam could potentially result in the displacement of wildlife species in the immediate vicinity of the project site. Construction activities could affect normal fish and wildlife behaviors, such as feeding, breeding, resting, and movement throughout their habitat. In addition, noise can stress individuals, disrupt communications and other natural sounds, or displace individuals from their habitat. During and immediately after construction, terrestrial and aquatic habitats would be disturbed from construction equipment modifications to the topography within the construction sites. Construction equipment would cause little or no direct mortality to wildlife, which can generally disperse into neighboring habitat. Construction work would last 1-2 years or longer, depending on the scope of the project. Construction crews would implement BMPs, such as restricting ground-moving activities during nesting or hibernation periods of certain species, using qualified biological construction monitors to avoid vehicle strikes to the greatest extent possible, and replanting native vegetation in disturbed areas to the greatest extent possible.

Rehabilitation of the dam would result in the clearing and mowing of forested habitat. This area would be removed from forested habitat and maintained as a mowed, early successional habitat area. This would reduce the availability of upland habitat for terrestrial wildlife species for the duration of the project life. However, the removal of small amounts of forest is not expected to noticeably increase resource competition or decrease habitat availability for terrestrial species outside of the normal range of habitat variation.

Determination: There would be short term minor effects from construction activities and long-term minor impacts from the removal of forested habitat due to rehabilitation of PA-463. Rehabilitation of PA-463 would result in negligible long-term impacts as the natural flow regime is restored, and riparian habitat is re-established.

Riparian Areas

No Action – The No Action alternative would have no new effects on riparian areas under continued operation of the dam. However, in the event of a dam breach, riparian areas—including adjacent wetlands, streambanks, and floodplains would be subject to significant short-term impacts such as erosion, sediment deposition, and destruction of established vegetation from the sudden release of impounded water. In the long term, the absence of regulated flows currently provided by the dam could lead to more frequent and intense flood pulses, increased streambank instability, reduced sediment retention, and shifts in vegetation structure and composition. These changes could degrade riparian habitat quality and reduce the ecological function of riparian corridors over time.

Determination: Continued operation of the dam under the No Action alternative would result in negligible effects on riparian areas. However, if a dam breach were to occur, it could cause both immediate and long-term degradation of riparian systems due to uncontrolled flooding, erosion, and unregulated flow conditions. While the full extent of

long-term impacts is uncertain, they may include streambank instability, vegetation loss, and reduced ecological function within affected riparian corridors.

Structural Rehabilitation Alternative – Construction activities associated with the rehabilitation of PA-463 would result in temporary impacts to approximately 0.35 acres of riparian areas, and permanent impacts to approximately 0.30 acres of riparian vegetation. The affected area is located below the existing dam embankment and consists of a mix of forested, wetland, and floodplain riparian vegetation, including areas where these features overlap (e.g., forested wetlands within the floodplain). These areas would be permanently altered through incorporation into the enlarged dam embankment, spillway, and associated maintained grassy surfaces. Restoration and replanting of native vegetation will be implemented in temporarily disturbed riparian zones where practicable, following construction.

Determination: The rehabilitation alternative would result in minor short-term effects from construction-related disturbance to riparian vegetation, and long-term minor impacts due to the permanent conversion of approximately 0.30 acres of overlapping forested, wetland, and floodplain riparian habitat to maintained structural features.

Forest Resources

No Action – This alternative would have no immediate effects on forest resources during continued operation of the dam. However, in the event of a dam breach, downstream forested areas—particularly riparian woodlands and floodplain forests—could experience adverse effects from rapid inundation, erosion, sediment deposition, and debris flow. These impacts could lead to tree mortality, root exposure, and long-term degradation of vegetative structure within the breach inundation zone.

Determination: There would be no effects to forest resources from routine operation and maintenance. However, if a breach were to occur, adverse short-term and potentially long-term effects to downstream riparian and floodplain forest resources could result.

Structural Rehabilitation Alternative – Construction activities related to rehabilitation of the dam would result in temporary and permanent impacts of forested areas. Construction would remove approximately 9.8 acres of forested land. This effect would begin during construction and persist as the area would be incorporated into the enlarged dam, spillway, and maintained grassy areas. Replanting with herbaceous native vegetation and allowed natural regrowth will occur in approximately 3.76 acres in disturbed areas outside of the dam maintenance areas.

Determination: There would be minor short-term effects from construction activities at PA-463. Approximately 9.8 acres of tree clearing area would be replanted with 3.76 acres of herbaceous native vegetation and allow for natural forest re-growth. The rehabilitation of the dams would result in long term minor impacts from the removal of a total of 9.8 acres of forested vegetation.

Cultural and Tribal Resources

NRCS made determinations of eligibility and findings of effect in consultation with the Pennsylvania State Historic Preservation Office (PA SHPO) and consulting Tribes in accordance with 36 CFR 800.4 and 36 CFR 800.5. Consulting Tribes—including the

Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Seneca-Cayuga Nation, Shawnee Tribe, Onondaga Nation, and the Stockbridge-Munsee Community, Band of Mohican Indians—were provided the opportunity to review and comment on identification efforts, eligibility determinations, and findings of effect.

Documentation of tribal consultation, including correspondence and responses, is included in Appendix A of the Watershed Plan and has been prepared in accordance with 36 CFR 800.11. Where no response was received, NRCS followed the procedures outlined in 36 CFR 800.3(c)(4).

No Action – No historic properties were identified within the dam embankment or upstream flood pool due to prior disturbance from original construction and subsequent inundation. Therefore, no direct effects to historic properties are anticipated within these areas under the No Action condition.

However, under a dam breach scenario, flood inundation has the potential to result in direct and indirect adverse effects to historic properties located downstream within the breach inundation area. Identified NRHP-eligible resources may be subject to physical damage, erosion, or deposition (direct effects), as well as changes to setting, feeling, and association (indirect effects), consistent with the criteria of adverse effect defined in 36 CFR 800.5(a)(1).

Accordingly, the No Action condition has the potential to result in adverse effects to historic properties.

Determination: No historic properties, as defined under 36 CFR 800.16(l), were identified within the PA-463 dam embankment or upstream flood pool due to prior disturbance associated with dam construction and ongoing inundation.

Under the No Action condition, an eventual catastrophic dam failure has the potential to result in direct and indirect adverse effects to historic properties located downstream within the breach inundation area. These effects may include physical damage from floodwaters (direct effects) as well as alteration of setting, feeling, and association (indirect effects), consistent with the criteria of adverse effect defined in 36 CFR 800.5(a)(1).

Structural Rehabilitation Alternative – Under the Structural Rehabilitation Alternative, project activities would be largely confined to previously disturbed areas associated with the existing dam and auxiliary spillway. No expansion of the Top of Dam (TOD) elevation or upstream flood pool is proposed, and no ground disturbance is anticipated in previously undisturbed areas identified as having archaeological sensitivity. Because no historic properties were identified within the limits of disturbance, the undertaking would not directly affect any known historic properties. In addition, the rehabilitation activities would not alter the setting or visual characteristics of nearby historic properties in a manner that would diminish their integrity.

NRCS determined that the Structural Rehabilitation Alternative would result in No Effect to Historic Properties, consistent with 36 CFR 800.5(a)(1). This determination was made by NRCS in consultation with PA SHPO and consulting Tribes.

PA SHPO concurred with the NRCS determination in May 2025. Consulting Tribes, including the Absentee Shawnee Tribe of Indians of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Seneca-Cayuga Nation, Shawnee Tribe, Onondaga Nation, and the Stockbridge-Munsee Community, Band of Mohican Indians, were engaged throughout the Section 106 process. Tribal consultation included review of identification efforts, eligibility determinations, and findings of effect in accordance with 36 CFR 800.2(c), 36 CFR 800.4, and 36 CFR 800.5.

Several Tribes provided responses concurring with the determination or indicating no objection to the project. In cases where no response was received, NRCS followed the procedures outlined in 36 CFR 800.3(c)(4). Documentation of all consultation efforts and responses is provided in Appendix A of the Watershed Plan in accordance with 36 CFR 800.11.

Determination: No historic properties, as defined under 36 CFR 800.16(l), were identified within the PA-463 dam embankment or upstream flood pool due to prior disturbance associated with dam construction and ongoing inundation. The Structural Rehabilitation Alternative would be confined to previously disturbed areas and would not involve ground disturbance in areas where historic properties have been identified or are likely to be present.

Accordingly, NRCS determined that the undertaking would result in No Effect to Historic Properties, consistent with 36 CFR 800.5(a)(1). This determination was made by NRCS in consultation with the Pennsylvania State Historic Preservation Office (PA SHPO) and consulting Tribes.

Local, Regional and National Economy

No Action – PA-463 would continue to degrade and ultimately breach during a major flood event. Breach modeling predicts inundation of 84 residential structures, 23 commercial buildings, 5 institutional facilities, and approximately 12.99 miles of public roads. This includes both local and state-owned corridors that serve daily transportation, emergency response, and tourism access throughout Monroe County. Damage to these assets would result in widespread disruption to businesses, government services, and community life.

The economic effects of a breach would be particularly severe in Barrett Township and the greater Pocono Mountain region, where the economy is closely tied to tourism, outdoor recreation, and small business enterprises. Dam failure could cut off access to popular destinations such as Skytop Lodge and nearby recreational areas, reduce visitor traffic, and result in job losses and long-term income reductions. Downstream communities would face recovery costs related to infrastructure repair, property loss, and business interruptions.

At the regional and national levels, a dam breach could trigger costly federal emergency response and recovery efforts, including road and bridge repairs, flood debris removal, and public assistance. These financial burdens would be borne not only by local agencies but also by state and federal programs. Additionally, the sudden loss of ecosystem functions such as sediment retention and regulated flow would lead to

downstream water quality degradation, further impacting economic uses such as fishing, recreation, and downstream property values.

Determination - The No Action alternative would result in significant direct, adverse, and major short-term impacts on the local and regional economy. Long-term effects would also be adverse, including reduced economic activity, increased public expenditure, and long-term disruption to critical services and infrastructure. These consequences extend to national interests through elevated disaster response and recovery costs.

Structural Rehabilitation Alternative – The Preferred Alternative involves rehabilitating PA-463 to restore dam safety and performance consistent with current NRCS and Pennsylvania Department of Environmental Protection standards. Structural improvements include repairs of the principal spillway intake riser, modification of the auxiliary spillway, embankment reconstruction, and other measures to ensure the dam's long-term function as a floodwater retarding structure. These actions will protect 112 downstream structures, including homes, businesses, and public facilities—while safeguarding over 12 miles of essential transportation routes.

The total project cost is estimated at \$27.57 million, of which approximately \$18.96 million will be federally funded under PL 83-566. Although the formal benefit-cost ratio is 0.12, this figure does not capture the full range of economic value provided by flood risk reduction and preserved infrastructure function. Monetized annual benefits are estimated at \$100,205, primarily associated with avoided flood damage. However, unquantified benefits include the sustained operation of businesses, reduced recovery costs, maintained property values, and protection of the tourism economy. These benefits extend beyond local boundaries by reducing national disaster costs and reinforcing economic resilience in the Delaware River watershed.

The Preferred Alternative also preserves provisioning, supporting, and cultural ecosystem services essential to the regional economy, including recreational access, trout fisheries, wetland habitat, and community identity. These values are recognized under the Principles and Requirements for Federal Investments in Water Resources (PR&G), which support the advancement of watershed rehabilitation projects based on risk reduction, resilience, and sustainability even when conventional cost-effectiveness thresholds are not met.

Determination - The Preferred Alternative is expected to result in minor long-term beneficial effects on the local and regional economy. By preventing catastrophic infrastructure loss and economic disruption, the project supports continued community function and economic vitality. Though not cost-effective under strictly monetized criteria, the project is justified under PR&G and the NWPM as a necessary investment in economic resilience and public safety.

Public Health and Safety

No Action – The updated dam breach analysis prepared for this Plan indicates that failure of PA-463 would result in inundation of 84 residential structures, 23 commercial buildings, 5 institutional facilities, and 12 bridges, along with approximately 12.99 miles of roadways (9.79 miles of state and 3.21 miles of local roads). Based on standard U.S. household occupancy rates, the PAR is estimated at approximately 411 individuals.

These estimates are conservative and reflect permanent residents only; daytime populations within commercial and institutional structures could increase actual exposure. Affected infrastructure includes critical transportation corridors and public service buildings, which could significantly impede emergency response and recovery. Inundation mapping and structure-specific risk areas are included in Appendix C of the Watershed Plan.

Key transportation routes in the study area include PA-447 (Creek Road), a state designated north to south highway that runs adjacent to Brodhead Creek and traverses the downstream inundation zone. Average daily traffic (ADT) data from PennDOT (2022) indicates that PA-390 north of Canadensis sees approximately 1,500 vehicles per day, while volumes increase to about 3,600 vehicles south of the village center. PA-463 is not directly connected to a major highway but is accessible via local roads from PA-390. Interruption or damage to these routes due to a dam failure would not only affect local access but also hamper emergency evacuation and service restoration during flood events.

Determination: In the event of a dam breach, there would be significant direct, adverse, major short-term impacts from this alternative on public health and safety. Long term impacts would be adverse and major.

Structural Rehabilitation Alternative – The Rehabilitation Alternative will address identified dam safety deficiencies and improve existing level of flood protection for the 50-year storm event provided by PA-463. Rehabilitation measures include modifications to the auxiliary spillway, which will be modified to safely convey the FBH and raised to contain the 50-year storm event. Although this does not elevate the dam to provide full protection against the 100-year storm event, the improvements will reduce the frequency of the auxiliary spillway activation and the likelihood of overtopping and structural failure during extreme storm events.

These changes result in a minor long-term positive effect on public safety by enhancing dam stability and reducing risk to downstream communities. However, some properties will remain within the 100-year floodplain. These residual flood risks are described in Section 3.2.5.5, and Appendix C of the Watershed Plan contains a map identifying structures that remain within the 100-year floodplain under the Preferred Alternative.

Determination: The Preferred Alternative will have a minor long-term beneficial effect on public health and safety by reducing dam failure risk. Some flood risk remains, but the selected alternative substantially improves public safety relative to the No Action alternative.

Land Use

No Action – Under the No Action alternative, failure to rehabilitate PA-463 could ultimately lead to a dam breach. A breach scenario would expand the current 100-year floodplain from 849 acres to approximately 1,105 acres. This increase in inundation would elevate the downstream flood risk by more than 200%, potentially threatening existing infrastructure and altering land use patterns. Development within newly impacted areas would likely be constrained by Monroe County's Flood Hazard regulations and land use bylaws.

Over the long term, a breach would result in significant changes in land cover from urban, residential, and agricultural uses to more flood-prone and disturbed land types. These changes would also degrade habitat continuity, particularly along riparian corridors, and may lead to informal abandonment of properties due to recurring flood impacts.

Determination: In the event of a dam breach, there would be significant direct, adverse, and major impacts in the short term on land use integrity. Long-term effects on land use and land cover would also be major and adverse due to increased flooding, infrastructure damage, and potential shifts in local development priorities.

Structural Rehabilitation Alternative – The rehabilitation of PA-463 would preserve the dam’s existing flood attenuation capacity, thereby maintaining the current configuration of the 100-year floodplain and avoiding conversion of upland areas into flood-affected zones. Construction activities would temporarily alter land cover at the dam site, with vegetation clearing, soil disturbance, and equipment staging areas introducing short-term impacts. Revegetation of disturbed areas would be completed post-construction using native species to promote ecosystem resilience and visual compatibility with surrounding land uses. The rehabilitation action supports the continued use of adjacent lands for agriculture, residential purposes, and ecological functions without expanding the footprint of developed or disturbed lands.

Determination: Effects on land use and land cover under this alternative would be minor, localized, and temporary, limited to the dam construction footprint. Long-term effects would be negligible and would preserve existing land uses and floodplain function.

Will the proposed action or action alternatives (if any) make an irreversible or irretrievable commitment of Federal resources?

Irreversible commitments include the permanent removal of trees and associated vegetation in the auxiliary spillway area downstream of the proposed labyrinth weir. These trees and habitat features cannot be restored to their original state in the short term, and the loss represents a permanent change to the ecological character of that area.

Irretrievable commitments primarily involve the use of construction materials, labor, and financial resources. Although these inputs cannot be recovered once used, they are necessary to reduce long-term risk, improve public safety, and meet dam safety standards. The short-term use of these resources is offset by long-term benefits, including reduced potential for dam failure and associated economic losses (NWPM § 501.43; NECH § 610-A.5; 7 CFR § 650.8(e)).

In accordance with NRCS planning policy and NEPA requirements, these commitments have been evaluated as part of the overall assessment of environmental consequences. Their inclusion supports a reasoned choice among alternatives and reflects full disclosure of long-term environmental and economic tradeoffs (NECH § 610.10(A)(3); NWPM § 501.0(D)).

Endangered Species Act

Endangered Species Act (ESA) consultation was completed with U.S. Fish and Wildlife Service. Early in the process, both the USFWS IPaC and the Pennsylvania National Diversity Inventory were consulted to identify potential threatened and endangered species which may be located within the Study Area. Once the preferred alternative was identified, NRCS entered into formal consultation with USFWS. The USFWS concurred that the minimal tree removal associated with the project is not likely to adversely affect the listed species.

The U.S. Fish and Wildlife Service (USFWS) concurred with a “May Affect, Not Likely to Adversely Affect” (NLAA) determination for the northern long-eared bat and a “No Effect” determination for the northeastern bulrush, which is not present within the project area. The Information for Planning and Consultation (IPaC) system will be revisited during final design to confirm listed species status and consider the potential federal listing of the tricolored bat.

National Historic Preservation Act – Section 106 Review

In accordance with 36 CFR § 800.4, NRCS consulted with PA SHPO and federally recognized Tribes throughout the Section 106 process, including consultation on the identification of historic properties within the APE, evaluation of historic significance and National Register eligibility, and NRCS’ determination of effect. Consulting parties were provided with cultural resource investigation reports and supporting documentation and were afforded the opportunity to review and comment. Correspondence documenting this consultation is included in Appendix A of the Watershed Plan.

No historic properties affected. Section 106 Review has been completed for the project area and no National Register eligible cultural sites were found.

Consultation with Federally Recognized Tribes

Correspondence documenting Section 106 consultation, including outreach to all consulting Tribal Nations, responses received, and NRCS’ determinations and findings, is summarized in Table 8 and provided in Appendix A of the Watershed Plan.

Watershed Plan Appendix A includes representative correspondence sufficient to demonstrate compliance with 36 CFR 800.11.

Table 7. Record of Consultations with PA SHPO and Federally Recognized Tribes

Date	Type	Purpose	Participants
March 14, 2022	Public Scoping	Invitation for participation	Absentee Shawnee, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe, Onondaga Nation, PASHPO, Seneca-Cayuga Nation, Shawnee Tribe, Stockbridge-Munsee Community. Courtesy copy sent to germane THPO.
December 22, 2023	Alternatives meeting	Request for participation and comment	Absentee Shawnee, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe, Onondaga Nation, PASHPO, Seneca-Cayuga Nation, Shawnee Tribe, Stockbridge-Munsee Community. Courtesy copy sent to germane THPO.

Date	Type	Purpose	Participants
August 26, 2024	Selected alternatives letter	Invite Sovereign Tribes, outside agencies for review and comment on selected alternatives	Absentee Shawnee, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe, Onondaga Nation, Seneca-Cayuga Nation, Shawnee Tribe, Stockbridge-Munsee Community. Courtesy copy sent to germane THPO. PASHPO was inadvertently omitted but stated via a phone conversation that as we were not requesting a formal review and the Phase 1 was not yet complete, they were not concerned.
November 1, 2024	Response to Scoping Letter	No Effect determination	Eastern Shawnee Tribe
October 31, 2024	Response to Scoping Letter	No Effect determination	Shawnee Tribe
April 10, 2025	Consultation on determination of effect. Included CR Report, design, as built, maps and descriptions.	Request for concurrence of determination of effect and SHPO determination of Eligibility for dam structure	Absentee Shawnee, Delaware Nation, Delaware Tribe of Indians, Onondaga Nation, PASHPO, Seneca-Cayuga Nation, Stockbridge-Munsee Community.
April 17, 2025	PASHPO response.	Request for clarification on specific issues.	PASHPO
April 17, 2025	Response to PASHPO request	Deliver requested clarification(s).	PASHPO
April 29, 2025	Response to Scoping Letter	No Effect determination	Stockbridge-Munsee Community
May 19, 2025	PASHPO Response deadline.	Concurrence with determination of effect and issuance of eligibility determination	PASHPO
May 20, 2025	Final consultation attempts with tribal governments	Conform with 36CFR800.4(b)(1)	No Response
May 23, 2025	Determination of effect cutoff per 36CFR800.3(c)(4)	Documentation of no response	Absentee Shawnee, Delaware Nation, Delaware Tribe of Indians, Onondaga Nation, PASHPO, and Seneca-Cayuga Nation.
TBD	Interagency and public review	Review Draft Plan	Public, Agencies, Tribal Organizations, Sponsors, and Stakeholders
TBD	Public Notice	Inform public of FONSI	Public, agencies, tribal governments, sponsors, stakeholders

Date	Type	Purpose	Participants
No definite date	Distribution and Posting of Final Plan to NRCS Website	Inform public of Final Plan	Sponsors mail out and post Final Plan for all agencies, Sovereign Tribes and Public Stakeholders

Clean Water Act (CWA)

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determination:

Project may or will affect waters, including wetlands. Modifications/design criteria have been included to ensure compliance with CWA is met. All permits received and modifications/design features are clearly presented and documented in the analysis.

Prior to the start of construction using federal funds, the project Sponsor will be responsible for securing and complying with all applicable federal, state, and local permits, including those under the CWA, Pennsylvania Chapter 105 and 102 regulations, and the National Pollutant Discharge Elimination System (NPDES) program. Compliance with permit conditions, mitigation plans, and environmental protection measures will be required throughout construction.

Consultation with the U.S. Army Corps of Engineers (USACE) indicates that mitigation requirements for jurisdictional wetlands and streams at PA-463 will be based on the extent of permanent impacts, including 2.27 acres of wetlands and 970 linear feet of stream impacts associated with spillway modifications. These requirements will be determined during the individual permitting process. Due to the scope of disturbance, mitigation is expected to be limited and may be fulfilled through on-site enhancement or compensatory credit purchase through a Pennsylvania Department of Environmental Protection (PADEP)-approved mitigation bank.

The NRCS coordinated with the USACE Philadelphia District regarding potential jurisdictional wetlands and permitting requirements under Section 404 of the CWA. The USACE issued correspondence advising that proposed work at the Leavitt Branch Dam may involve waters and/or wetlands under USACE jurisdiction and recommended a site-specific Jurisdictional Determination (JD) be conducted during the final design phase.

Clean Air Act

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determination:

The project will not result in permanent air emissions and no modifications or further coordination needs to occur to ensure compliance.

Special Management Area Considerations

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determinations based on special management area presence, proximity, or lack of:

No activities are proposed within or in the vicinity of Special Management Areas.

Pertinent Executive Orders

The applicable subject matter experts have determined the proposed action (and action alternatives, if any) are in compliance with the following Executive Orders (EO), which were deemed pertinent based on the nature of the proposal:

EO 11988, Floodplain Management

Rehabilitation of PA-463 will increase downstream flood protection, resulting in no change to the existing extent of the 100-year floodplain and no change in floodplain function and value.

EO 11990, Protection of Wetlands –

The preferred action will include means to minimize harm to existing wetlands. Impacts are expected to be limited; however, mitigation efforts will be implemented through on-site enhancements or compensatory credit purchase through a PADEP approved mitigation bank. Mitigation efforts will be determined during the individual permitting process in consultation with the U.S. Army Corps of Engineers.

EO 13007, Indian Sacred Sites – Not Applicable

EO 13112, Invasive Species

The reconnaissance survey for the dam sites identified no invasive species. However, the Town indicated the species observed include multiflora rose, Japanese barberry, autumn olive, and garlic mustard.

The incorporation of BMPs into the construction documents for compliance by the contractor will provide for the control of spread of invasive species. BMPs would include: 1) use of equipment and construction / timber mats that are thoroughly cleaned prior to mobilization to the site and prior to demobilization, 2) cleaning construction equipment before moving to a new site to minimize the risk of transporting seeds or propagules, 3) proper disposal of excavated or dredged material, 4) disposal of excavated and dredged material in pre-approved, non-wetland areas, 5) provide training or personnel with knowledge of identification of invasive species; 6) applying control treatments prior to construction and monitoring during and after construction.

EO 13186, Migratory Birds –

Minor short-term impacts due to temporary habitat removal during construction. Long-term, reservoir conditions maintained.

The Brodhead Tributary Watershed and PA-463 dam site attract a variety of migratory bird species. Thirteen migratory bird species, including bald eagle, have been identified by USFWS as having potential to occur in the project area, and others are likely to be present as well. The dam is not located in any Audubon Important Bird Areas (IBA).

During construction, temporary disturbances such as noise, vegetation clearing, and human activity may affect migratory birds and their nesting or foraging behavior. However, these impacts are expected to be localized and short-term. Long-term habitat availability may be slightly altered but is not expected to significantly reduce the overall suitability of the area for migratory birds. USFWS suggested minimizing the risk of take

to migratory birds by choosing to remove trees when birds are unlikely to be nesting (tree removal recommended between September 1 and March 31). A determination of NLAA has been received from the USFWS (Watershed Plan Appendix A).

EO 13443, Facilitation of Hunting Heritage and Wildlife Conservation –

Construction activities related to rehabilitation of the dam could potentially result in the temporary displacement of wildlife species in the immediate vicinity of the project site. Construction activities could affect normal fish and wildlife behaviors, such as feeding, breeding, resting, and movement throughout their habitat. In addition, noise can stress individuals, disrupt communications and other natural sounds, or displace individuals from their habitat. During and immediately after construction, terrestrial and aquatic habitats would be disturbed from construction equipment modifications to the topography within the construction sites.

Construction equipment would cause little or no direct mortality to wildlife, which can generally disperse into neighboring habitat. Construction work would last a year or two, or longer, depending on the scope of the project. Construction crews would implement BMPs, such as restricting ground-moving activities during nesting or hibernation periods of certain species, using qualified biological construction monitors to avoid vehicle strikes to the greatest extent possible, and replanting native vegetation in disturbed areas to the greatest extent possible.

Certifying Statement for EA Page Limit and Deadline

The Responsible Official certifies that this EA:

- ☒ Demonstrates the agency has thoroughly considered the factors mandated by NEPA;
- ☒ Represents the agency's good-faith effort to prioritize documentation of the substantive issues and most important considerations required by NEPA within the congressionally mandated page limits;
- ☒ Reflects the agency's expert judgment;
- ☒ Addressed briefly, or left unaddressed, any issues or considerations that were, in the agency's judgment, comparatively not of a substantive nature;
- ☒ Represents the agency's good-faith effort to fulfill NEPA's requirements within the Congressional timeline (or within the minimally extended timeline) and this effort is substantially complete; and
- ☒ Contains analysis that is adequate to inform and reasonably explain the responsible official's final decision regarding the proposed action or selected alternative.

APPENDICES

- Watershed Project Map
- Study Area Map
- Existing Conditions Map
- Preferred Alternative Map

