

**DEPARTMENT OF THE ARMY PERMIT EVALUATION
AND DECISION DOCUMENT**

APPLICATION NUMBER: CENAB-OP-RPA (WILKES-BARRE INFLATABLE STRUCTURE)
2003-01240-13

This document constitutes our Environmental Assessment, Statement of Findings, NEPA Analysis, 404(b)(1) Guidelines Analysis, Public Interest Review, Public Hearing Evaluations, and Finding of No Significant Impact.

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for Above-Numbered Permit Application

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I. Applicant: Luzerne County Flood Protection Authority (LCFPA)

Attn: Mr. Jim Brozena
Luzerne County Courthouse
200 North River Street
Wilkes-Barre, PA 18711-1001

II. Location, Existing Site Conditions, Project Description w/WRDA Background, and Changes to Project:

1. Location: The project is located on the Susquehanna River, in the City of Wilkes-Barre, Larksville Borough, Edwardsville Borough, Kingston Borough, Forty Fort Borough, and Plains Township, Luzerne County, Pennsylvania (see Figure 1).

The applicant is proposing to discharge dredged and fill material into the Susquehanna River, and adjacent wetlands, for the construction of an inflatable structure that will span the Susquehanna River. The structure will be located on the river bottom from the south bank of the Susquehanna River, from Gordon Avenue, behind the levee pump station, within the City of Wilkes-Barre, to the north bank of the Susquehanna River, near the intersection of S.R. 011 with Riverside Road, in Larksville Borough. The applicant is proposing to inflate the structure from approximately Memorial Day through Labor Day every year to create a seasonal recreational impoundment that will extend approximately 4.5 miles upstream from the structure to include the waterfronts of Edwardsville Borough, Kingston Borough, Forty Fort Borough, and Plains Township, all within Luzerne County, Pennsylvania. Latitude 41-14-45, Longitude 75-54-59 (Wilkes-Barre West, PA, USGS Quadrangle N: 22.0 inches, W: 6.0 inches).

A Denil fish passage facility is proposed along the north bank of the river as well as an eel ladder. The applicant also proposes to use an “operational flexibility” design to mitigate water quality concerns. Operational flexibility is the term used to describe potential adjustments to the inflatable bladders that can raise or lower the height of the structure. These adjustments could be used to lower the structure during high flow events or to mitigate water quality concerns associated with CSOs and to allow for a flow-through system to ensure water flow quantity and velocity are maintained downstream.

2. Existing Site Conditions: The project area is a segment of the Susquehanna River within a system of flood damage reduction projects constructed by the U.S. Army Corps of Engineers (Corps) and operated and maintained by the LCFPA. Riparian depression and main stem floodplain wetlands are the most common types found within the project area. Thirty-five (35) palustrine wetland areas were identified and delineated within the project area. Of the wetland habitats identified, palustrine forested wetlands (PFO) and combinations of PFO and other wetland types composed 77% of the total acreage of wetlands. Dominant vegetation in these forested wetlands consists of silver maple, red maple, and box elder. Five wetlands identified as riverine habitats were also identified within the bed and banks of the Susquehanna River. Principal wetland functions and values are identified as flood flow alteration, sediment/toxicant retention, nutrient removal, and wildlife habitat values.

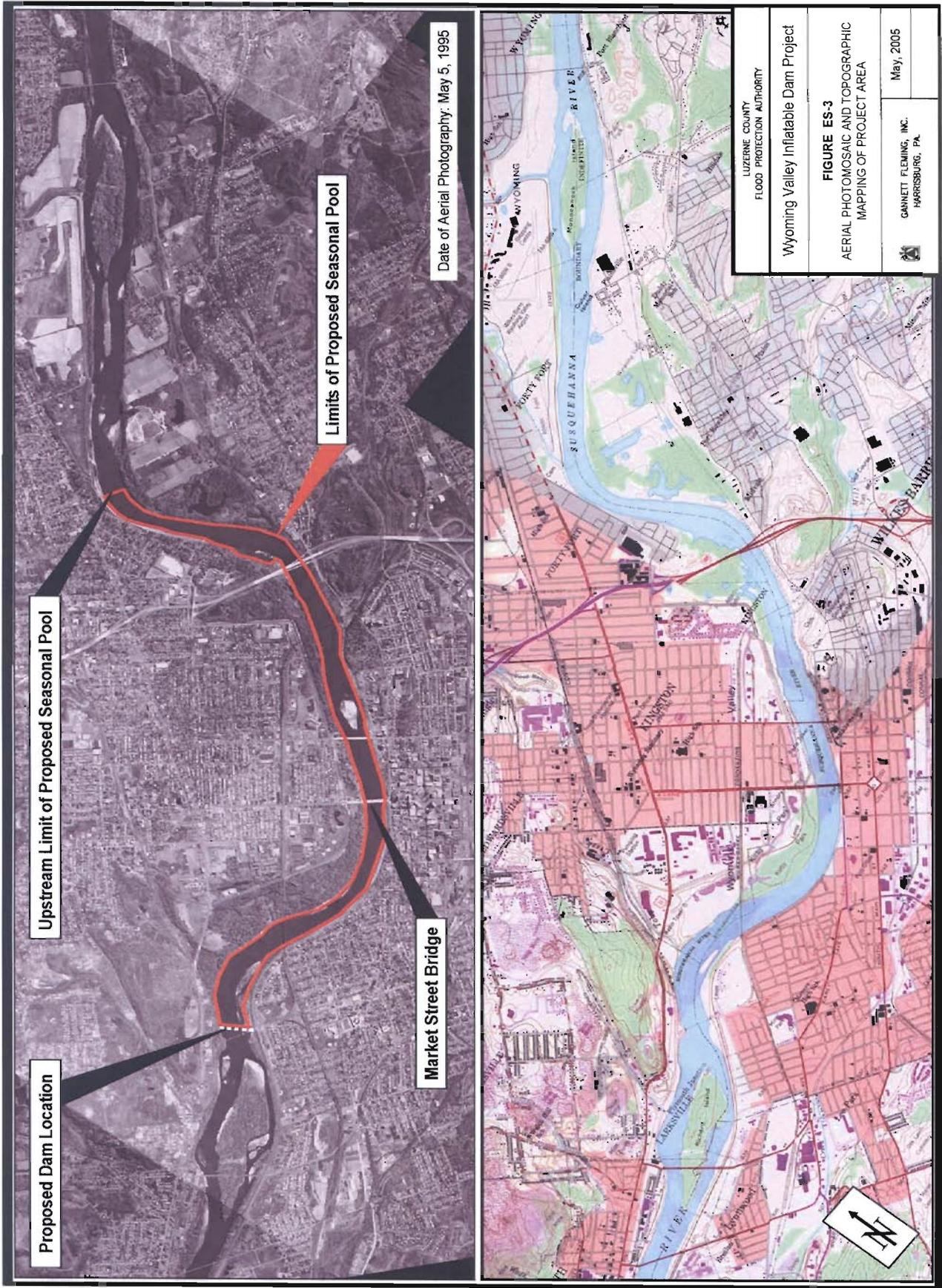


Figure 1. WBIS Project Location and Vicinity Map

Waterways within the project area include the Susquehanna River, and its tributaries: Toby Creek, Mill Creek, and Tang Creek.

The existing land use in the surrounding area includes a mixture of urban and rural lands that is forested, agriculture, abandoned mines, small towns, and cities. Areas were heavily mined and acid mine drainage (AMD) has impacted the water quality of this reach of river. The Pennsylvania Department of Environmental Protection (PADEP) has listed this reach of the Susquehanna River as an impaired for aquatic life use with the source of the impairment listed as AMD (PADEP, February 27, 2006, pg. 3). The water quality in this reach of the river is also affected by Combined Sewer Overflows (CSO) (USEPA, December 8, 2005, pg. 2). CSOs are untreated sewage discharges into the Susquehanna river resulting from either wet weather or dry weather events. There are currently sixteen (16) CSO outfalls within the limits of the proposed impoundment, with an additional twenty-three (23) CSO outfalls upstream between Forty Fort and West Pittston.

3. Project Description:

a. Background:

The Luzerne County Flood Protection Authority (LCFPA) is the applicant for the proposed Wilkes-Barre Inflatable Structure (WBIS).

LCFPA is also the non-Federal sponsor for a flood damage reduction project, actually a system of projects, located on the Susquehanna River in Northeast Pennsylvania in the vicinity of Wilkes-Barre. To understand the relationship between these flood damage reduction projects and the WBIS, it is necessary to discuss the legislative developments that have modified and implemented the flood damage reduction projects in Wyoming Valley.

Four Corps flood damage reduction projects completed in the 1940s were overtopped by Tropical Storm Agnes in 1972, resulting in tremendous economic damage and loss of life. As a result of the devastation wrought by the Agnes flooding, the Baltimore District of the Corps evaluated the existing flood control projects in the Wyoming Valley, which were originally designed to protect against a flood having the magnitude of a March 1936 flood event, which was about a 50 year level of protection. Investigations to evaluate the feasibility of raising the level of protection produced a September 1981 Phase I General Design Memorandum (GDM), which recommended raising the existing levees and floodwalls by 5 to 7 feet, but also determined that the proposed modifications would result in adverse impacts to a number of communities. A partial impact reduction plan was recommended that would mitigate impacts for those communities that would experience significant increased flooding due to raising the existing levees and floodwalls.

Section 401 of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662) authorized the Wyoming Valley Levee Raising Project (WVLRP) as a USACE Civil Works project to provide Agnes level protection (estimated 370 year recurrence interval) to the four original projects, now referred to as the Wyoming Valley Levee System. The

approximately 15 miles of levees and floodwalls would be raised and the pump stations would be modified to be able to withstand as well as operate during an Agnes level storm.

During the late 1980s, pre-construction, engineering and design activities were underway to implement the WVLRP, and the authorized plan to reduce impacts was reexamined in light of its high cost and some local opposition to the plan. Section 4(r) of WRDA 1988 (P.L. 100-676) modified the WVLRP authority to authorize the Secretary of the Army to study the feasibility of constructing an “inflatable dam” on the Susquehanna River in the vicinity of Wilkes-Barre, Pennsylvania. Shortly after, a Reanalysis Report of the WVLRP was completed in October 1990. This reanalysis included revised options to address the impacts of increased flood damages, and made a recommendation to select a plan that would include all affected communities (not just those with significant impacts as in the authorized plan). However, this reanalysis report did not receive final approval from the Department of the Army.

Section 102(w) of WRDA 1992 (P.L. 102-580) further modified the WVLRP authorization, directing the Corps to complete the final phase II general design memorandum (Phase II GDM) for the project including the results of a review of nonstructural mitigation plans for the purpose of ameliorating damages from induced flooding. Additional analysis of alternative plans to address the impacts of increased flood damages continued. Eventually, a proposal that came to be known as “Plan 9” was recommended for implementation. Plan 9, which is in Chapter 7 of the Phase II GDM, provided for site-specific structural elements, non-site specific structural elements, and non-site specific elements. The site-specific structural elements included a WBIS. This Plan 9 was considered by the Assistant Secretary of the Army for Civil Works, (ASA(CW)), and the ASA(CW) provided guidance on outstanding issues associated with the WVLRP, including the WBIS, in January–February 1996. With concurrence of the ASA(CW), Plan 9 discussed that the Corps could implement some of the mitigation features, such as raising of authorized structural features in Sunbury, but explicitly discussed that design and construction of other mitigation components – notably the WBIS - would be the responsibility of a non-Federal sponsor. The Plan went on to describe that the non-Federal interest could apply for credit/reimbursement if and when a WBIS was constructed.

On October 12, 1996, Section 346 of WRDA 1996 (P.L. 104-303) again modified the WVLRP to (1) add as part of the construction of the project mechanical and electrical upgrades to stormwater pumping stations in the Wyoming Valley; and (2) to carry out mitigation measures that the Secretary would otherwise be authorized to carry out, but for the General Design Memorandum for phase II of the project, as approved by the ASA(CW), Assistant Secretary of the Army having responsibility for civil works, on February 15, 1996, providing that such measures are to be carried out for credit by the non-Federal interest. In other words, Section 346 of WRDA 1996 reaffirmed that although the WBIS was part of the mitigation plan, because it was not included in either the WRDA 1986 project authorization or the project modifications in WRDA 1992, the Corps was not authorized to design or construct it.

On October 23, 1996, the ASA(CW) and the LCFPA signed a cost sharing agreement for the WVLRP, called a Project Cooperation Agreement (PCA), agreeing that the Corps was not authorized to design or construct the WBIS as part of the mitigation plan. However, it was determined that the non-Federal sponsor can study the inflatable structure and should it be found feasible, the non-Federal sponsor may receive credit for construction. "The amount of the credit would be the lesser of the cost of actual work performed by the sponsor, or the cost had the Federal Government constructed the same features at the time the work was done." (Attachment to H. Martin Lancaster Memorandum for the Director of Civil Works, dated February 2, 1996, subject: Wyoming Valley Project, Pennsylvania). Mr. Lancaster's memorandum indicated that crediting of those elements of the mitigation plan that the non-Federal sponsor funds and implements could be up to amounts set for in the attachment to his memorandum. Plan 9, and the attachment to the memorandum indicated that the estimated cost of the WBIS was \$14 million.

In 2000, the Luzerne County Flood Protection Authority concluded a Feasibility Study for the WBIS (Gannett Fleming, Inc., 2000). The study investigated the engineering, environmental, economic issues and public acceptance of the proposed project. At the conclusion of the feasibility study, the LCFPA decided to proceed with the permit applications, final design, and construction of the project. In February 2003, the LCFPA met with several regulatory and resource agencies to discuss the project at a pre-application meeting. Based on input from the regulatory agencies, studies were performed to support a Corps permit application, and in June 2005, LCFPA submitted its initial application materials to the Corps Regulatory Branch for the WBIS.

b. Project Description:

The proposed project, described in the revised application for a Department of the Army permit received by the Corps on March 28, 2007, is to construct an inflatable structure spanning the Susquehanna River as part of the mitigation (recreational amenities) associated with the congressionally authorized levee-raising project. The proposed project will result in the discharge of dredged or fill material into the Susquehanna River, and adjacent wetlands, associated with the construction of an inflatable structure across the river. The proposed inflatable structure, with a fully inflated height of 9.5 feet, will maintain the water surface level of the pool near elevation 517 feet (NGVD 1929) between approximately Memorial Day and Labor Day each year. The water surface elevation of the river in the vicinity of the Market Street Bridge will be raised approximately 4 feet higher than average during the period when the structure is inflated. The seasonal recreational impoundment will extend approximately 4.5 miles upstream from the structure. The width of the pool will vary between 550 feet and 1,000 feet. The average depth of the impoundment pool will be approximately 8-10 feet, with the deepest area more than 25 feet.

A Denil fish passage facility, including an eel ladder, along the north bank of the river, is incorporated into the inflatable structure design. The applicant also proposes to use operational flexibility to mitigate water quality concerns associated with CSOs and to allow for a flow-through system to ensure water flow quantity and velocity are maintained downstream. When inflated, operational

flexibility will provide for adjusted elevations based on real time flow conditions in the Susquehanna River.

The proposed project would seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of valuable riffle and pool complexes. With the Denil fish way and eel ladder, impacts to waters of the U.S., and adjacent jurisdictional wetlands, include: a) Permanent impacts to 1.73 acres of the Susquehanna River associated with the construction of the service road and the inflatable structure foundation with rip-rap scour protection; b) Permanent impacts to 1.03 acres of palustrine forested riparian wetlands (0.13 acre associated with the construction of the permanent portion of the structure plus 0.90 acre associated with the proposed normal pool elevation of 517 feet (NGVD 1929); c) Temporary impacts to 2.81 acres of the Susquehanna River due to construction activities associated with the inflatable structure foundation and; d) Temporary impacts to 0.92 acre of palustrine forested and palustrine emergent riparian wetlands associated with the contractor staging area and construction activities.

c. Changes to the Project:

(1) The original permit application was received by the Corps on June 28, 2005, and included an inflatable structure with a vertical slot serpentine fish passage facility proposed along the north bank of the Susquehanna River. The project would be located on the river bottom from the south bank of the Susquehanna River, from Gordon Avenue, behind the levee pump station, within the City of Wilkes-Barre, to the north bank of the Susquehanna River, near the intersection of S.R. 011 with Riverside Road, in Larksville Borough. The proposed project would seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of valuable riffle and pool complexes. With the vertical slot fish way design, impacts to waters of the U.S., and adjacent jurisdictional wetlands, included: a) Permanent impacts to 1.79 acres of the Susquehanna River associated with the portage ramp, fish passage facility, and the inflatable structure foundation, which includes rip-rap scour protection; b) Permanent impacts to 1.06 acres of palustrine forested riparian wetlands (0.16 acre associated with the construction of the permanent portion of the structure plus 0.90 acre of associated with the proposed normal pool elevation of 517 feet (NGVD 1929); c) Temporary impacts to 3.68 acres of the Susquehanna River associated with construction activities for the fish passage facility and the inflatable structure foundation; and d) Temporary impacts to 0.89 acre of palustrine forested and palustrine emergent riparian wetlands associated with the contractor staging area, site access and construction activities.

(2) A revised permit application was received by the Corps on August 17, 2006, and included an inflatable structure at the same location as the final proposed project (see above). This revised permit application included eliminating the vertical slot fish way in place of using a wide range of 'operational flexibility' for both fish passage and to mitigate water quality concerns associated with CSOs. Operational flexibility is the term used to describe potential adjustments to the height of the structure to mitigate for various flow conditions or to address water quality concerns. During the period from late May through June 18, it was proposed that the structure would be operated to allow for unimpeded passage of American shad, other anadromous finfish, and resident

fish (allowing only a 2 foot or less head differential from the downstream side to the upstream side of the structure and at least 14 inches of water flowing over the structure). When the structure was inflated, operational flexibility would also allow the structure to be lowered during high flow events to allow frequent flushing of the impoundment. The proposed project would seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of valuable riffle and pool complexes. With this design, impacts to waters of the U.S., and adjacent jurisdictional wetlands, included: a) Permanent impacts to 1.63 acres of the Susquehanna River associated with the construction of the service road and the inflatable structure foundation with rip-rap scour protection; b) Permanent impacts to 1.03 acres of palustrine forested riparian wetlands (0.13 acre of palustrine associated with the construction of the permanent portion of the structure plus 0.90 acre associated with the proposed normal pool elevation of 517 feet (NGVD 1929); c) Temporary impacts to 2.69 acres of the Susquehanna River due to construction activities associated with the inflatable structure foundation; and d) Temporary impacts to 0.92 acre of palustrine forested and palustrine emergent riparian wetlands associated with the contractor staging area and construction activities.

III. Statutory Authority and Corps Regulatory Decision Process:

This application for an individual DA permit was reviewed pursuant to Section 10 of the River and Harbor Act (RHA) and Section 404 of the Clean Water Act (CWA). The RHA establishes permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States. The Susquehanna River at Wilkes-Barre is a traditional navigable water subject to regulation under the RHA. Section 10 (33 U.S.C. 403) grants the Corps permit authority which covers construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course, location, condition, or capacity of those waters.

The CWA is a comprehensive statute designed "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). To accomplish this goal, the CWA prohibits the discharge of any pollutant, including the discharge of dredged or fill material into waters of the U.S., except as in compliance with, among other things, permits that may be issued under Section 404 of the CWA. The Corps is the agency charged to make decisions regarding 404 permits, and it does so under a framework of regulation known as the Section 404(b)(1) Guidelines 40 CFR § 230.10. Notwithstanding the title of 'guidelines', the 404(b)(1) Guidelines are binding, substantive rules that must be applied when the Corps considers proposed discharges of fill material into waters of the U.S.

The Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material ("Guidelines"), stipulate that no discharge of dredged or fill material into a water of the U.S. (i.e., jurisdictional wetlands and rivers) shall be permitted if there is a practicable alternative which would have less adverse impact on the aquatic environment, so long as the alternative does not have other significant adverse environmental consequences. Even if an applicant's preferred alternative is determined to be the Least Environmentally Damaging Practicable Alternative (LEDPA), the Corps must still determine whether the LEDPA is in the public interest. The Corps Public Interest

Review, described at 33 CFR 320.4, directs the Corps to consider a number of factors in a balancing process. A permit will not be issued for an alternative that is not the LEDPA, nor will a permit be issued for an activity that is determined to be contrary to the public interest. In considering both the LEDPA and the Public Interest Review the Corps must consider compliance with other applicable substantive laws such as the Endangered Species Act and the National Historic Preservation Act as well as consult with other Federal Agencies. The Corps also must follow procedural laws such as NEPA, and other applicable laws described in 33 C.F.R. Section 320.3.

Also relevant to this particular decision is Section 404(q) of the Clean Water Act. Section 404(q) requires the Department of the Army to enter into interagency agreements to minimize duplication, needless paperwork, and delays in the Section 404 permit process. Current agreements allow the U.S. Environmental Protection Agency (USEPA) and the Department of Commerce and the Interior to request higher level review within the Department of the Army when they disagree with a permit decision which is about to be made by the district engineer. Guidance from HQUSACE regarding previous 404(q) decisions is valued by the Corps districts as important agency policy statement.

IV. Project Purpose:

Defining the project purpose is critical to the evaluation of any project and in evaluating compliance with the Clean Water Act Section 404(b)(1) Guidelines. The 404 Guidelines and subsequent 404(q) guidance require that the Corps define the basic project purpose and the overall project purpose to ensure appropriate consideration of alternatives.

1. Basic Project Purpose:

The basic purpose is the most simple or irreducible purpose of the project and is used to determine whether the applicant's project is "water dependent" (Section 230.10(a)(3)). The water dependency test contained in the Guidelines creates a presumption that activities that do not require access or proximity to or siting within special aquatic sites to fulfill their basic project purpose are not water dependent. Therefore, the Guidelines state that practicable alternatives to non-water dependent activities are presumed to exist, are less damaging, and are environmentally preferable to alternatives that involve discharges into special aquatic sites (e.g., wetlands and riffle pool complexes) (40 CFR 230.10(a)(3)).

The basic project purpose for the Wilkes-Barre Inflatable Structure is to "mitigate for impacts to river access and loss of recreational opportunity caused by the raising of the Wyoming Valley levees". Mitigation for impacts to river access and loss of recreational activity can be accomplished through a number of structural or non-structural alternatives which do not require siting in special aquatic sites. For example, such alternatives or combination of alternatives could include portals for access between downtown Wilkes-Barre and the riverfront, fishing piers with public access, annual sponsored recreational fishing/canoeing/kayaking tournaments, walkways, interpretive trails, and other strategies that would enhance recreational opportunities in the Wilkes-Barre area. Therefore, I have determined that this basic project purpose is not water dependent, and in accordance with the Guidelines, practicable alternatives which do not

involve discharges into special aquatic sites are presumed to exist unless clearly demonstrated otherwise (40 CFR 230.10(a)(3)).

2. Overall Project Purpose:

In addition to defining the basic project purpose, the Corps must also define the overall project purpose. The overall project purpose establishes the scope of the alternatives analysis and is used for evaluating practicable alternatives under the Guidelines. In accordance with the Guidelines and HQUSACE guidance, the overall project purpose must be specific enough to define the applicant's needs, but not so narrow and restrictive as to preclude a proper evaluation of alternatives. The Corps is responsible for controlling every aspect of the Guidelines analysis.¹ In this regard, defining the overall project purpose is the sole responsibility of the Corps. While generally focusing on the applicant's statement, the Corps will in all cases exercise independent judgment in defining the purpose and need for the project from both the applicant's and the public's perspective.² In several meetings with the applicant, dating back to a 1999 pre-application meeting with the applicant, and in subsequent correspondence from the Corps to the applicant, we have emphasized the requirements of the Guidelines and HQUSACE guidance, including the water dependency test and thorough evaluation of alternatives.³

During a meeting with the applicant on May 22, 2007, the Corps defined the overall project purpose as mitigation for intangible socio-economic impacts caused by the WVLRP, providing economic development for the Wyoming Valley region, and providing river based recreational opportunities. In their August 24, 2007, response to Corps and agency comments on their proposed project, the applicant agreed with this overall project purpose, however, they indicate that "the inclusion of the inflatable structure provides the assurance that the purpose and need of the project will be met throughout the recreational season every year and it maximizes the benefits of all riverfront development and improvements on both river banks." The applicant suggests that the inflatable structure is necessary to realize the full mitigation potential and satisfy the overall project purpose.⁴ The Corps disagrees with this position that only structures in the river could satisfy the overall project purpose.

The Corps has determined that the three objectives of the overall project purpose: mitigation for intangible socio-economic impacts caused by the WVLRP, economic development for the Wyoming Valley region, and river-based recreational opportunities, are integrated and necessary to meet the applicant's purpose and need and to allow for proper consideration and evaluation of alternatives. The applicant's needs have been considered in the context of the desired geographic area of the development and the type of project being proposed. The geographic scope of the alternatives considered are limited to locations that would mitigate for adverse impacts to the Wyoming Valley at Wilkes-Barre and include alternatives that are structural and non-structural to meet the three objectives of the overall project purpose statement.

¹ See HQUSACE Guidance Memorandum: Decision of the Director of Civil Works, Patrick J. Kelly, Permit Evaluation: Plantation Landing Resort, Inc., May 9, 1989, at page 4.

² 33 CFR Part 325 Appendix B (9)(c)(4), See also 53 Fed Rg. 3136 (February 3, 1988)

³ Letters from Corps of Engineers to permit applicant dated April 21, 2003, July 21, 2003, February 17, 2004, May 6, 2005, February 3, 2006, and January 30, 2007.

⁴ Letter from Gannett Fleming on behalf of LCFPA to the Corps of Engineers, dated August 24, 2007

Because the basic project purpose and the objectives of the overall project purpose are to mitigate for impacts caused by the WVLRP, and those three objectives are integrated, only those alternatives which satisfy all of these objectives need to be evaluated. That is, we agree with the applicant that the alternatives analysis should consider only those alternatives which satisfy the integrated objectives of the overall project purpose. Therefore, the Corps did not evaluate alternatives for each objective separately, but instead, we evaluated practicable alternatives that satisfy all three objectives of the overall project purpose comprehensively.

The Corps has determined that it would be inappropriate and would thwart the intent of the Guidelines to only evaluate a seasonal recreational impoundment to satisfy the river based recreation element of the overall project purpose. Alternatives that do not involve discharges of fill into waters of the U.S. are presumed to exist and alternatives which seek to avoid adverse impacts to aquatic resources must be evaluated.⁵ Consistent with the Guidelines and HQUSACE 404(q) guidance, as part of this alternatives analysis, the Corps and the applicant have identified other non-structural alternatives and combinations of structural and non-structural alternatives to be fully evaluated in compliance with the Guidelines and the overall project purpose.⁶

In conclusion, while the Corps should consider the views of the applicant regarding the project purpose and the existence (or lack of) practicable alternatives, the Corps must determine and evaluate these matters itself, with no control or direction from the applicant and without undue deference to the applicant's wishes.⁷ To do otherwise, would render the alternatives analysis of the Guidelines meaningless (i.e., the applicant could define the project purposes so narrowly as to effectively preclude the existence of practicable alternatives). Therefore, recognizing this requirement, the District has determined that, neither the basic project purpose (mitigation for the WVLRP) nor the overall project purpose (mitigation for socio-economic impacts of levee raising, economic development for the Wyoming Valley Region, and river-based recreational opportunities) are water dependent. Therefore, non-structural alternatives must be evaluated. To comply with this important regulatory mandate, the Corps and the applicant have appropriately identified both non-structural and structural alternatives which are evaluated in the alternatives analysis for this environmental assessment.

V. Scope of Analysis:

The scope of this Environmental Assessment (EA) has been defined pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et. seq., the regulations of Council on Environmental Quality, 40 C.F.R. § 1500 et. seq., and the NEPA implementing regulations of the Department of the Army (DA), U.S. Army Corps of Engineers, 33 C.F.R. Parts 230 and 325, Appendix B. The Corps scope of analysis extends to the entire project when there is sufficient Federal control over the entire project to make the project a Federal action. Federal control may include Federal funding, regulation, assistance, or approval.

⁵ 40 CFR Part 230.10(a)(3).

⁶ See Applicant's response letter dated July 2, 2007, regarding alternatives analysis matrix and Corps letter dated September 11, 2007, to the applicant regarding updated matrix.

⁷ Plantation Landing HQUSACE Guidance page 4.

The scope of analysis for this project is the entire 4.5 mile reach of the Susquehanna River to be filled and/or inundated by the structure, jurisdictional wetlands to be filled and/or inundated as a result of construction of the inflatable structure, and the immediately adjacent wetland and upland areas to be affected by the seasonal pooling of water. A large part of the project is located within regulated waters of the U.S. and requires Department of the Army authorization under Section 404 of the CWA and Section 10 of the RHA. The project location was selected and designed to provide mitigation for the impacts of the Federal Wyoming Valley Levee Raising Project and furthermore this proposed project could potentially receive \$14 million in Federal funds should it be permitted and constructed. There is a national register eligible property within the project area which is subject to review and compliance with Section 106 of the National Historic Preservation Act. For these reasons there is sufficient Federal control and responsibility over the entire project and the entire project area as described above is included in the Corps scope of analysis.

VI. Other Federal, State, and Local Authorizations Obtained, Required, or Pending:

1. State Authorizations: PADEP has not yet made decisions on the applications for 401 Water Quality Certification, and the Pennsylvania Dam Safety and Encroachment Act Chapter 105 Dam Permit.

2. Coastal Zone Management (CZM) consistency determination: Not applicable.

3. Essential Fisheries Habitat (EFH): Not applicable.

VII. Public Notice(s) / Public Hearing Evaluation and Summary of Comments:

1. Public Notice # 05-42: The application was initially reviewed on July 1, 2005, and determined to be incomplete. Sufficient information was present, however to issue a public notice. Therefore, Public Notice #05-42 was issued on October 10, 2005, for a 60 day review (expired on December 10, 2005) and was sent to all interested parties including appropriate State and Federal agencies. The initial project design included an inflatable structure with a vertical slot fish passage facility.

2. May 1, 2006 Public Hearing: In response to comments and requests received for a public hearing, the Corps and the PADEP held a joint public hearing on May 1, 2006, at Kings College, in downtown Wilkes-Barre, PA. The applicant announced that an alternate design, 'operational flexibility' would replace the vertical slot fish passage facility. A revised permit application was received by the Corps on August 17, 2006.

3. Public Notice # 06-51: In response to the revised design as indicated at the Public Hearing, the Corps issued a second public notice. Public Notice # 06-51 was issued on October 4, 2006, for a 30 day review (expired on November 3, 2006) and was sent to all interested parties including appropriate State and Federal agencies. The project design now included an inflatable structure with 'operational flexibility' that would replace the vertical slot fish passage facility.

4. Additional Coordination of Project Revisions: The applicant submitted another revised permit submission which was received by the District on March 28, 2007. The applicant stated that they would no longer use ‘operational flexibility’ to address fish passage, but would incorporate a Denil fish way design with an eel ladder. The applicant stated that this design would pass migratory fish and resident fish species with an eel ladder to pass American eel. The applicant still retained the concept of ‘operational flexibility’ as part of the project design, but only to meet recreational and environmental objectives, not to meet fish passage objectives. The project design now included an inflatable structure with a Denil fish passage facility, an eel ladder, and ‘operational flexibility’. Since the impacts to jurisdictional waters of the U.S. (waters and wetlands) did not change substantially, the Corps determined that a 3rd public notice was not necessary.

5. Summary of Comments: This section contains the summary of comments from elected officials and Federal and State resources agencies in response to the October 10, 2005, Public Notice (PN) # 05-42; the October 4, 2006, Public Notice (PN) # 06-51; and the May 1, 2006, Public Hearing. This section also contains the applicant’s response to these comments (where appropriate) and the Corps response to these comments.

The summary of comments from organizations and individuals from PN #05-42, PN #06-41, and from the May 1, 2006 Public Hearing can be found in Appendix A. Appendix A also contains the applicant’s responses to these comments (where appropriate) and Corps responses to these comments.

a. Elected Officials:

(1) Honorable Paul E. Kanjorski, U.S. Congressman

From PN #05-42:

The Honorable Paul E. Kanjorski, in a letter dated December 5, 2005, stated that he strongly supports the approval of all necessary permits to allow the Wyoming Valley inflatable structure project to move forward. The Congressman stated that this project will spur an economic revitalization in the Wyoming Valley and has already served as a catalyst for developing a plan to restore the Susquehanna River’s ecosystem.

The Congressman stated that the potential economic benefits of the proposed project have been well-documented. At his request in 1991, the Corps conducted an initial study to determine whether it would make sense to build an inflatable structure which would stabilize the water level of the river during the low flow months. The Congressman also stated that in May 2000, Gannett Fleming, Inc., released a study that indicated that the construction of an inflatable structure on the Susquehanna River is not only feasible but would be a tremendous asset for the Wyoming Valley, attracting 200,000 to 400,000 visitors annually. The economic benefits of this study are estimated to bring annual revenues of a minimum of \$4 million, or as much as \$70 million if additional riverfront development takes place. The Congressman indicated that the State and local governments would recover more than their original stake in the construction cost over time.

In addition, the Congressman stated that the inflatable structure would enhance the viability of the associated riverfront amenities plan in the Wilkes-Barre area. Because the inflatable structure will create a stable area of recreational water for eight to nine months of the year, it will play a vital role in ensuring that water levels are maintained at a point that will allow for maximum usage of the Corps riverfront amenities. Without the stability created by the inflatable structure, the Congressman stated that these Corps riverfront amenities would be subject to the wide water level fluctuations that are common along the Susquehanna River, particularly in the summer months.

The Congressman comments that the inflatable structure would also serve to focus the community's attention on the need to address the water quality issues affecting the Susquehanna River. The primary cause of the degraded water quality of the river is the continued operation of CSOs throughout the Wyoming Valley.

The Congressman stated that, a study commissioned by the Wyoming Valley Sanitary Authority (WVSA), estimated that correcting those CSOs which most directly impact this area of the river will cost an estimated \$28 million. When matched with non-Federal sources, the Federal funding will allow the WVSA to undertake a \$9.2 million project. This figure represents nearly one-third of the amount needed to address the overflow problem in the direct vicinity of the inflatable structure.

The Congressman commented that community leaders are also working to develop a comprehensive plan to address water infrastructure problems on a regional basis. He stated that the Army Corps has the authority to undertake environmental restoration projects, including CSO rehabilitation, in several counties in Pennsylvania. The Congressman stated that he was working with Congressman Don Sherwood on a bipartisan basis to include Luzerne County in this program in the next Water Resources Development Act. Under this program, the Federal government provided 75% of a project's cost. The remaining 25% will be covered by non-Federal sources. Funds will also remain available for this project under the Environmental Protection Agency's State and Tribal Assistance Grant program at a cost share of 55% Federal, 45% non-Federal. Finally, the Congressman stated that the WVSA is continuing to pursue funding sources at the State level, including the Pennsylvania Infrastructure Investment Authority (PENNVEST).

In closing, the Congressman stated that the erection of the levees effectively created a barrier between the river and the community and as such, the community paid little attention to the water quality of the Susquehanna River prior to the Congressman's initial suggestion that the inflatable structure be pursued. This project has therefore served to focus the community's attention on the need to restore the river's ecosystem. If the opportunity is missed to pursue the inflatable structure project because the necessary permits are not issued, the Congressman would be concerned that the focus to restore the river's ecosystem will wane.

The Congressman thanked the Corps for the consideration of his views.

- *Corps Response: The Corps acknowledges the Congressman's strong support for this project and acknowledges the Congressman's position that this project will spur economic revitalization in the Wyoming Valley. The Corps has considered and addressed the Congressman's comments in Public Interest Review Factors 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, and 20.*

From May 1, 2006 Public Hearing:

Mr. Fred Ney, representing the Congressman's office, provided testimony on behalf of Congressman Kanjorski.

"Our community has a unique opportunity to shape the future of the Wyoming Valley through the construction of an inflatable dam on the Susquehanna River. The dam would provide a strong incentive to invest in cleaning up the river, encourage economic growth throughout the region, and enhance the viability of planned riverfront improvements.

Standing about nine feet high, the inflated structure would create a 450-acre recreational lake within the river's natural banks, extending 4.5 miles upstream from the dam site at Richards Island to Forty Fort. The lake would allow for boating, fishing, picnicking, hiking, sightseeing and nature studies during the summer. The dam poses no risk of flooding because it can be deflated in about 20 minutes to allow the river to flow freely in cases of heavy rainfall.

Gannett Fleming's award-winning feasibility study indicates the project would attract up to 400,000 visitors each year, bringing about \$70 million in economic activity. The State and local governments would recover more than their original stake in the construction cost through the economic benefits that this project will bring to the Wyoming Valley.

Water quality along the Susquehanna River remains an issue that our community must address. That is why I have worked with my colleagues in Congress to obtain \$5.1 million in Federal funds to eliminate CSOs, which are pipes that discharge wastewater into the river during heavy rainfalls. When combined with the required local match, these funds will pay for about one-third of the CSO sites in the vicinity of the project. We are; therefore, already well on our way to correcting one of the most problematic environmental problems along the river.

If I had my druthers, I would invest the full amount of funding necessary to return the river to its once-pristine beauty. However, Federal funding does not always flow in the ideal direction. The money I have obtained for the inflatable dam's construction cannot be used to clean up the river. If these Federal funds are not used for the inflatable dam, they must be returned to the Federal government. The Wyoming Valley would get neither a seasonal lake nor a clean river.

Since completion of major construction for the levee-raising project, I have worked closely with the Luzerne County Commissioners and the Corps to move forward with plans to enhance the riverfront in Wilkes-Barre. Utilization of these amenities, which include a

riverfront plaza, a performance amphitheater, and a boating pier, require a stable water level along the river during the summer months. The inflatable dam will provide that stability by controlling water flow. Anyone who has viewed the Susquehanna River in July knows that water levels are often too low to permit recreational use of the river. Without the stabilized water created by the inflatable dam, our community may be left with water levels that are too low to allow for safe boating.

The project will not interfere with the annual shad migration because this project --- process typically occurs in the months before the dam would be inflated. An environmental impact study found that the inflatable dam would pose no significant environmental danger to local aquatic and terrestrial wildlife.

Our community has historically viewed the Susquehanna River as a threat to be feared. With the completion of the levee project, we now have the chance to transform the Susquehanna River into an asset to be cherished. If we seize the opportunity to continue improving the water quality and develop a seasonal lake along the Susquehanna riverfront, our region will enjoy the environmental and economic benefits for generations to come. Thank you”.

- *Corps Response: The Corps acknowledges the Congressman’s strong support for this project and the fact that this project will spur economic revitalization in the Wyoming Valley. The Corps has considered and addressed the Congressman’s comments in Public Interest Review Factors 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, 20, and 21.*

(2) John Sedeski – Councilman: Edwardsville Borough

From PN # 05-42:

The Edwardsville Borough Council stated in a letter dated December 1, 2005, that they support the inflatable structure project. Edwardsville Borough occupies a large portion of the shore line within the 4.5 mile impoundment area and hosts the largest tributary flowing into the proposed impoundment area, Toby Creek. Edwardsville Borough has been developing their own extensive community revitalization projects (parks/ball fields; rails-to-trails; and if the feasibility study supports it, a marina) based upon the approval of this inflatable structure. These projects would most assuredly act as the catalyst for the (water quality) cleanup and further growth of the adjoining area. The areas for development in conjunction with the inflatable structure project would create a major recreational complex for the entire county, and provide for the first time in Wyoming Valley history, a facility that would encourage the wide spread use and enjoyment of the Susquehanna River.

- *Corps Response: The Corps has considered and addressed the Edwardsville Borough comments in Public Interest Review Factors 1, 2, 3, 4, 10, 13, 15, and 20.*

From May 1, 2006 Public Hearing:

Councilman Sedeski presented a compact disc (CD) of a Power Point presentation that he wanted on record. This CD becomes part of the official records of the public hearing. The Councilman stated, however, that because the power point presentation runs approximately 45 minutes, he did not have the opportunity to show it at the hearing.

The Councilman stated that Edwardsville is definitely in support of the inflatable dam, and with seven council members, it has been a unanimous decision that this inflatable dam be encouraged.

Edwardsville Borough occupies a large portion of the shore line within the 4.5 mile impoundment area and hosts the largest tributary flowing into the proposed impoundment area, Toby Creek. The CD presented for the record is entitled the *Edwardsville Mid-Valley Arena and Recreational Complex*. This comprehensive plan allows development along Toby Creek to provide amenities to the approximate 400,000 people who will visit the area with the inflatable structure in place. The comprehensive plan would create a dedicated access road, a unique road that would take you to the dam. It would provide boat launches, portages for the river, supporting parking and fueling facilities. The plan would also provide for overnight storage for boats. The Toby Creek area is also a convergence point for both the Rails to Trails and the levee path, so access would be to both at this location and also for the Susquehanna River trail system. This comprehensive plan would also allow Edwardsville Borough to develop their own extensive community revitalization projects (parks/ball fields, and a possible marina) based upon the approval of this inflatable structure.

Permanent structures can be created in the Edwardsville area because the comprehensive plan is not on the river side of the levees but rather on the protected side. Facilities would be constructed for the hikers, bikers, and the boaters who will come to the area.

Councilman Sedeski stated Edwardsville has attracted almost \$50 million in private investment in just the past 24 months and that the inflatable dam project would help leverage additional investment proposals by creating vastly improved assets which benefit not just the community, but the entire west side.

- *Corps Response: The Corps has considered and addressed the Councilman's comments in Public Interest Review Factor 1, 2, 3, 4, 8, 9, 10, 11, 13, 15, 17, and 20.*

(3) Stephen Urban – Luzerne County Commissioner

From May 1, 2006 Public Hearing:

Commissioner Urban is one of three Luzerne County Commissioners and he is personally not in favor of the inflatable dam until the river is cleaned up first. The Commissioner stated that the county has been working hard with Congressman Kanjorski and Senator Musto and Congressman Sherwood, who provided \$1 million last year for the cleanup of CSOs. The Commissioner believes, however, that there is a lot more work that needs to be done to clean up the river. The Commissioner is a strong advocate of getting access to the river and he stated that for the economic benefits, the portals, the amphitheater, and the

fishing pier (Riverfront Development Plan) would serve this purpose. In addition, the Commissioner stated that the county has made a significant commitment of \$4 million to help restore the Sterling Hotel to its original purpose as a place of prominence in the community and that this would help attract people to the area.

- *Corps Response: The Corps has considered and addressed the Commissioners' comments in Public Interest Review Factors 2, 3, 4, 13, 15, and 20.*

(4) Mayor Thomas M. Leighton – City of Wilkes-Barre

From May 1, 2006 Public Hearing:

Mayor Leighton and the City of Wilkes-Barre fully support the efforts of the Luzerne County Flood Protection Authority (applicant) in their attempts to develop this project. The Mayor indicated that through the efforts of Congressman Kanjorski, attempts are being made to clean the river, remove the polluted water and create a recreational environment that would not only benefit Wilkes University and Kings College, but the entire Wyoming Valley. The Mayor indicated that now is the time, with the revitalization of downtown (Wilkes-Barre) and the Hotel Sterling, to finally take advantage of a water resource that has been neglected for years. The Mayor stated that there is a natural body of water that runs through downtown that is not utilized. The Mayor indicated that there will be an economic boost from this project, not only to the City of Wilkes-Barre, but to the surrounding boroughs of Kingston, Forty Fort, Wilkes-Barre Township, Plains, and Mountaintop. The Mayor stated that with elected officials all aiming for the same goal, (that goal being to make Wilkes-Barre and the Wyoming Valley a greater place for all of us to raise a family), now is the time to take advantage of developing this project (the inflatable structure).

- *Corps Response: The Corps has considered and addressed the Mayors' comments in Public Interest Review Factors 2, 3, 4, 13, 15, 17, and 20.*

b. Federal Agencies:

(1) U.S. Environmental Protection Agency

From PN # 05-42:

USEPA stated in a letter, dated December 8, 2005, that they are very concerned that there are significant water quality issues that must be overcome before the proposed project can be implemented. Water quality in the proposed project area is currently listed as impaired by AMD and is compromised regularly by CSOs. The proposed project would have the potential to inundate five of the CSOs within the project area creating backflow and acting as potential sources of wastewater overflow to the impounded receiving waters. The fecal coliform levels in the river were reported by the Luzerne Flood Control Protection Authority (2000) to have reached or exceeded the Pennsylvania Department of Health water quality standard. USEPA expressed "extreme concern" that the impoundment of poor quality river water may pose significant risks to human health from exposure to bacterial pathogens.

Until subsequent studies have been conducted, there is no assurance that the surrounding waters would not be impaired for recreational purposes by raw sewage discharges occurring from these systems. Based on the potential significant environmental and human health impacts that could result from implementation of the project as proposed, USEPA recommended denial of the permit. USEPA strongly recommended that an Environmental Impact Statement (EIS) be prepared to fully address the direct, secondary, and cumulative impacts on the quality of the human environment. In addition, USEPA stated that adverse impacts to resident and anadromous fish would be expected to occur from the implementation of the proposed project. Although a fish passage would be proposed, USEPA expressed concern that the passage of migratory fish, including shad and eel, would be compromised by dam construction. USEPA did not request elevation under Part IV of the 1992 404 (q) MOA between the USEPA and the Department of the Army.

- *Applicant's Response: The applicant's response to address fish passage, eel passage, and water quality issues was to eliminate the vertical slot fish way and use operational flexibility. The applicant stated that operational flexibility would be used to address the passage of American shad, resident fishes, and other anadromous fish. The applicant would also use the operational flexibility design to mitigate water quality concerns associated with CSOs.*

- *Corps Response: The Corps acknowledges USEPA's recommendation for an EIS and a request for permit denial. The Corps has also considered and addressed USEPA's comments in Public Interest Review Factors 2,5,7,13,15, 17, and 21.*

From PN # 06-51:

Per the 1992 Memorandum of Agreement between the USEPA and the Corps, USEPA requested a 15-day extension on PN #06-51. A Corps letter to USEPA dated November 3, 2006, granted a 19-day extension. USEPA stated in a letter, dated November 21, 2006, that even with 'operational flexibility', USEPA continued to be concerned that there are significant water quality issues that must be overcome before the recreational benefits of the proposed project would be realized. Secondly, USEPA still had concerns that passage of migratory fish, including shad and eel, would be compromised by the proposed project. In addition, the applicant had not addressed the specific water quality concerns that USEPA requested in its January 6, 2006, letter to the applicant. USEPA did not request elevation under Part IV of the 1992 404 (q) MOA between the USEPA and the Department of the Army.

Lastly, USEPA continued to recommend denial of the permit until an EIS is completed and the operational issues and effects to fisheries are thoroughly addressed. USEPA strongly suggested that the following action be considered:

- 1.) Creation and implementation of a Public Notification Program be outlined specifically for use by the project in order to advise the public on potential human health risks associated with CSO discharges.

2.) A written explanation regarding monitoring the water quality during the recreational season, including identification of the parameters to be used to determine when the pool conditions are “unfavorable” and what actions would be taken to inform the public of this characterization.

- *Applicant’s Response: The applicant’s responses to these issues are summarized below:*

1.) *Fish passage – To accommodate passage of both Anadromous, migratory, and resident fish, the applicant has now proposed a Denil fish way design, eliminating the concept of ‘operational flexibility’. This new fish way would have the same entrance and supplemental attraction flow as was initially proposed for the ‘vertical slot’ passageway. The Denil fish way would also incorporate an eel ladder. The Denil fish way would allow for migratory fish and resident fish to pass. Regarding the American shad, the applicant stated that water temperatures rise above the optimal temperature (70 degrees F) during the migration period and an inflatable structure at Wilkes-Barre would pose no impact to migrating shad with an inflation date within the first two weeks of June, as water temperatures downstream rise above 70 degrees F.*

2.) *Water quality – The applicant stated that operational flexibility would still be used to mitigate the water quality concerns associated with CSOs and thus this design would not be expected to aggravate existing water quality problems. This assertion is based on the inflatable structure design, which is a continuous flow-through system that would be inflated during the summer months, and during that time period the structure may be lowered during high flow events to allow frequent flushing of the river. Thus the structure would not be expected to increase the threat to human health and safety in association with the CSOs. In addition, it is the applicant’s understanding that the Wyoming Valley Sanitary Authority is making progress towards eliminating the CSOs through the long-term control plans suggested by the USEPA.*

3.) *Public Notification Program - The applicant stated it would implement a public notification program that would monitor and provide advisories when CSOs discharge and offer recommendations on recreating within the pool and inform the public on the need to prevent ingestion of river water. The applicant stated that a public notification and advisory program would be submitted to the agencies contingent upon permit authorization.*

- *Corps Response: The Corps acknowledged and addressed USEPA’s comments in response to PN # 05-42 above. In addition, the Corps acknowledges USEPA’s request for a Public Notification Program and for a water quality monitoring program for use during the recreational season. To address USEPA November 21, 2006, request, the applicant responded as noted above.*

For comments relevant to this public notice (PN # 06-51), the Corps has considered and addressed USEPA’s comments in Public Interest Review Factors 2, 3, 4, 13, 15 and 17.

(2) U.S. Fish and Wildlife Service (USFWS)

From PN # 05-42:

USFWS Field Office (State College, PA) stated in a letter dated December 8, 2005, that the proposed inflatable dam project may have substantial and unacceptable impacts on the aquatic resources of the Susquehanna River – a resource of national importance. In this case, the Susquehanna River; its fisheries resources; riverine and riparian habitats; and forested non-tidal wetlands would be adversely affected.

USFWS Regional Office (Hadley, MA) letter, dated December 16, 2005, confirmed that the project would have a substantial and unacceptable impact on aquatic resources of national importance (ARNI), in accordance with the procedures of Part IV of the 1992 404(q) MOA between the Department of the Interior and the Department of the Army.

The December 8, 2005, letter stated that there no Federally listed or proposed threatened or endangered species known to occur within the project area. Therefore, no further consultation under the Endangered Species Act would be required with the USFWS. USFWS stated, however, that there are several other substantial outstanding issues that would need to be addressed by the applicant. They are outlined as follows:

1.) *Fish passage* – Over the past 40 years, State and Federal resource agencies, utilities, and citizens groups have committed over \$75 million to rebuilding fish populations in the Susquehanna River and constructing fish passage at the four major downstream dams. The shad restoration goal is to reestablish an annual spawning population of two million shad and 20 million herring by the year 2025. USFWS stated that construction of yet another dam, with or without fish passage, would be counterproductive to the shad restoration effort, and would contribute cumulatively to the adverse effects of the downstream dams. Fish passage would be an issue for other fish species as well. The principal sport fishes in this reach of the Susquehanna River include smallmouth bass, walleye, northern pike, muskellunge, tiger muskellunge, channel catfish, and rock bass, while primary forage species include spottail shiner, spotfin shiner, and bluntnose minnow. The ability of fish to migrate within their environment is essential to their survival, regardless of whether that movement is localized (as for resident fish) or hundreds of miles (as for anadromous or catadromous fish). Longitudinal connectivity of a stream is also important to aquatic macroinvertebrates such as insects and mussels. Each mussel species, for example, is very specific in fish host selection. Because information on mussel populations in this area is lacking, the mussel resources of the project area, up and downstream of the proposed dam, should be surveyed and evaluated in any assessment of project effects.

2.) *Water quality degradation (thermal and chemical)* – The organization American Rivers designated the Susquehanna River as the nations' Most Endangered River in 2005, citing sewage pollution and dam construction as two of the biggest concerns of this river system. There are 34 CSOs discharges upstream of Pittston down to the proposed dam site (16 of these are within the proposed reservoir pool area). An additional 103 CSOs discharge into the Lackawanna River; the Lackawanna River is a tributary to the Susquehanna River,

located about nine miles upstream of the proposed dam. USFWS stated that damming and obstructing the free-flowing condition of the river would exacerbate CSO impacts of water quality, leading to anoxic waters, elevated fecal coliforms, odors, suspended wastes, disease-causing pathogens, elevated chemicals, substantial algal blooms, and significant risks to human health. The existence of this problem further reinforces the need to examine alternatives to a dam as a means of improving the Wilkes-Barre riverfront.

The Susquehanna River, downstream of the proposed dam, is on the State 303(d) list of impaired waters due to dissolved oxygen, organic enrichment, siltation, and flow alteration. Furthermore, the upper Susquehanna River (at Tunkhannock) is listed as impaired due to mercury (contaminant associated with sediment). The proposed impoundment at Wilkes-Barre would have the potential to trap fine sediments which would serve as a sink for mercury contamination generated upstream. This would be an important implication when considering fish mercury uptake, and any recreational fishery that would be expected to be created by the project.

3.) Alteration of riparian wetlands and shallow water habitats – USFWS expressed concerns about the inundation tolerance of the silver maple, the dominant tree species in the project area. Although the silver maple has an intermediate tolerance to inundation, extended periods of inundation during the growing season (which may occur if the proposed project is implemented) would be detrimental to those trees in forested wetlands along the Susquehanna River.

4.) Sediment deposition and erosion – USFWS stated that the project design would have the potential to create a substantial sediment deposition problem behind the dam during seasonal inflation of the bladders, thereby degrading fish habitat. In addition, the impoundment and its release would have the potential to erode stream bed and banks downstream of the project due to the high head pressure of water flowing over the dam; and secondly, increased recreational boating activity upstream of the dam would significantly increase bank erosion above the dam. The Sunbury Fabri-Dam, located downstream of Wilkes-Barre, in Sunbury, PA, provides a “working model” of the inflatable dam proposed for Wilkes-Barre. Since 1970, this dam has caused the lateral erosion of more than 50 feet of shoreline for a distance of about 2.5 miles upstream of the dam due to repeated saturation and erosion of the soil when the dam is inflated. The estimated annual loss of riverbank has averaged 18 inches per year. A total of 6,800 linear feet of Susquehanna River shoreline (4.8 acres) now must be stabilized with rip-rap at a cost of approximately \$5 million. Sunbury city officials have also indicated that the higher water elevations of the reservoir have had a detrimental effect on the city’s flood protection pumping stations. USFWS stated the potential for the Wilkes-Barre dam to have similar effects on the shoreline and pumping stations within the Wilkes-Barre levee system should be investigated.

5.) Other aquatic impacts – USFWS stated that changes in the flow regime of a stream, such as those caused by a dam, bring changes in surface water temperature (increased surface area raises the thermal input and increases the water temperature), dissolved oxygen (temperature increases cause decreased oxygen solubility), turbidity (increased), sedimentation (disrupts a stream’s ability to transport its own sediment load), and a shift in the quality and quantity of

food particles within the river (shifts from diatoms to green and blue green algae, often as heavy blooms). In addition, depending on sediment loading and water clarity, an increase in depth within the proposed impoundment could be sufficient to diminish sunlight penetration to the riverbed. This in turn, would have an added effect on aquatic productivity within the proposed impoundment.

6.) *NPDES effluent limits* – USFWS stated that impounding the Susquehanna River in this area would also affect NPDES discharges up and downstream of the dam. NPDES effluent limits are calculated based on the flow characteristics of the receiving waters. It is not clear if the applicant has evaluated the economic impact on discharges if these effluent limits would need to be more stringent during periods of impoundment.

7.) *Lack of an adequate alternatives analysis* – The USFWS stated the applicant should consider less environmentally damaging alternatives for providing recreational opportunities, such as revitalizing the riverfront within the city limits, promoting kayaking and canoeing, constructing biking and hiking trails, promoting other passive recreational opportunities (e.g., bird-watching, hiking, wildlife viewing, observing and photographing nature, picnicking, historical and archeological exploration, swimming, cross-country skiing, biking, running/jogging, climbing, and fishing) , and providing improved access to the river through levee portals. In addition, the Corps own plan of a riverfront park (addition of two portals through the levee, a river landing, a fishing platform and dock, and amphitheater and stage), would appear to be a practicable alternative to the proposed dam project.

Lastly, USFWS stated that the Wilkes-Barre dam proponents have pointed to the economic revitalization and recreational opportunities created by the Fabri-Dam at Sunbury. However, Sunbury officials admit that the Fabri-Dam has not brought the hoped-for economic revitalization.

Conclusion – USFWS believes that there are practicable alternatives to obstructing the free-flowing Susquehanna River for recreational purposes. An impounded stream channel would have multiple adverse environmental impacts. Even with a costly fish passage component, the project would impair State and Federal shad restoration efforts which have been financed at considerable taxpayer expense. Consequently, USFWS recommends that this permit be denied as contrary to the public interest. Should the Corps decide that it has insufficient information to support permit denial, USFWS recommends that the Corps not take action on this application until an EIS has been prepared that will address the full environmental, economic, and social effects of this project for the life of the project. Finally (as discussed above), the proposed inflatable dam project would have substantial and unacceptable impacts on the ARNI of the Susquehanna River. Accordingly, if the Corps decides to authorize this project, USFWS would seek a higher level of review in accordance with Section 404(q) of the Clean Water Act.

- *Applicant's Response: The applicant's response to these issues are summarized below:*

1.) *Fish passage (including American shad, resident fish, and other anadromous fish); eel passage; native mussel populations; and water quality - The applicant's response to address fish passage, eel passage, native mussel population, and water quality issues was to eliminate the vertical slot fish way and use operational flexibility. The applicant stated that operational flexibility would be used to address the passage American shad, resident fishes, and other anadromous fish and use the operational flexibility design to mitigate water quality concerns associated with CSOs.*

2.) *Sediment deposition and erosion – The applicant stated that minor temporary accumulations of sediments would accumulate but they would be carried downstream when the structure is deflated. In addition operational flexibility (i.e., deflating the structure) would be used during storm events to address the water quality issue; this means that sediments as well would be transported downstream during high flow events. The applicant stated that erosion is a concern at the Sunbury inflatable dam because 'wake' boating allows for jets skis and power boats. This would not be the case at this site. Because this would be a 'no wake' zone, erosion would not be an issue.*

3.) *Other aquatic impacts – The applicant stated that no other aquatic impacts would occur. Adjusting the heights of the inflatable bags through operational flexibility would form a flow through system eliminating the changes that would occur with a permanent impounded area. Average daily flow data were evaluated to determine that the detention time in the pool would be approximately 3 hours. Based on this information, the presence of the inflatable structure would not change the flow regime of the river.*

4.) *Wetland impacts and alteration of riparian wetlands and shall water habitats – The applicant stated that no secondary impacts to the approximately 13.0 acres of PEM and PFO wetlands would occur due to seasonal inundation. The applicant's groundwater and vegetation studies indicated that the existing trees and shrubs located within these wetlands are adapted to survive in saturated soils for extended periods of time under normal circumstances. Therefore, adverse secondary impacts to wetlands would not be anticipated. The applicant stated that to alleviate the agencies concerns, any permit issued would require wetlands monitoring of the approximate 13 acres as a special condition of the permit.*

5.) *Lack of an adequate alternatives analysis – The applicant stated that evaluating only alternatives that propose a 'structure' is the only way to meets the projects' purpose and need. This project was started by the 1991 Corps Reconnaissance Study where a dam was identified as mitigation for the Corps levee raising project. The applicant's May 2000 Feasibility Study identified the dam with other mitigation commitments (Riverfront Development Plan) as necessary components needed to realize the full mitigation potential.*

- *Corps Response: The Corps acknowledges USFWS's concern regarding NPDES effluent limits being affected by the proposed project. The applicant has not addressed NPDES effluent limits requested in USFWS's December 8, 2005, letter.*

The Corps has considered and addressed USFWS's comments in Public Interest Review Factors 1, 2, 3, 4, 5, 7, 9, 12, 13, and 15.

The Corps acknowledges USFWS's concerns regarding alternatives analysis. The Corps defined the project purpose and evaluated alternatives in the alternatives analysis section of this document.

The Corps acknowledges that USFWS's comments above are 404(q) comments. The Corps acknowledges USFWS's request for 404(q) project elevation and as such, if the Corps decides to authorize this proposed project, USFWS will seek a higher level review of the proposed permit in accordance with Part IV of the 1992 section 404(q) Memorandum of Agreement (MOA) between the Department of the Interior and Department of the Army.

The Corps acknowledges USFWS's request for permit denial and recommendation "for an EIS if the Corps decides that it has insufficient information to support a permit denial."

From May 1, 2006 Public Hearing:

USFWS continues to oppose this proposed project, stating that there are a host of issues associated with construction of the proposed dam that would be detrimental to the North Branch of the Susquehanna River, its floodplain, its riparian corridor, and its wetlands. These include, but are not limited to water quality degradation, sediment deposition, erosion, anadromous and resident fish passage, fish and wildlife habitat elimination, wetland elimination and conversion, and alteration of riparian and shallow water habitats.

In depth analysis of each USFWS issue is discussed at length above. The only statement made by USFWS at the May 1, 2006, public hearing that was not addressed above was the following:

"Public agencies and non-governmental organizations across the U.S. have realized the full environmental and economic costs of past dam construction, and are taking steps to remove such facilities, and it would be short-sighted of the applicant to be contemplating the construction of such a facility in Pennsylvania, especially on one of our nation's most threatened big rivers."

The USFWS (again) recommends denial of the permit and should the Corps decide it has insufficient information to support permit denial, USFWS requests an EIS to fully address the full environmental, economic, and social effects of the project for the life of the project. In addition, USFWS (again) has invoked 404(q) and should the Corps decide to authorize the project, USFWS will seek a higher level review of the proposed decision.

- *Applicant's Response: At the May 1, 2006 Public Hearing, the applicant announced a major modification to the project as a result of the initial responses received. This revision was formalized in a revised permit submission, received by the District on August 17, 2006. The USFWS's concerns have been addressed and are summarized under the applicant's response to USEPA, USFWS, and PAFBC PN # 06-5 comments..*

- *Corps Response: The Corps acknowledges the USFWS's concerns and addressed these concerns earlier in this document and in the Public Interest Review Factors identified above. In addition, the Corps acknowledges the USFWS's concern of the regional and national dam removal initiative.*

From PN # 06-51:

The USFWS again requested permit denial and an EIS be completed to address the full environmental, economic, and social effects of this project. USFWS continued to confirm that there are no Federally listed or proposed threatened or endangered species known to occur within the project area. Therefore, no further consultation under the Endangered Species Act would be required with the USFWS. The USFWS stated that the assumptions that the applicant made regarding operational flexibility are incorrect and that operational flexibility would not work for the passage of American shad and river herring. Enclosure B of their November 3, 2006, letter provided a report by USFWS Northeast Regional hydraulic engineer and fish passage expert from Massachusetts. This detailed report concluded that since shad or river herring cannot jump, the elevation change in having both the 2-foot differential and the 14-inch water column would be too great. In addition, this report addressed the fact that the fish migration window as stated by the applicant is incorrect. The applicant stated that June 18th would be an acceptable 'cut-off' date for operational adjustments for anadromous fish passage. The USFWS report concurred with the PAFBC that June 30th is an appropriate 'cut-off' date. Lastly, the USFWS report concluded that most resident fish would not be able to pass the Obermeyer gate due to the velocities over the gate.

USFWS stated that the outstanding concerns addressed in their December 8, 2005, letter are still valid concerns that have yet to be addressed by the applicant. These concerns (described earlier in this document) are as follows: water quality, fish passage, sedimentation and bank erosion, compensatory mitigation, NPDES effluent limits, other aquatic impacts, and alternatives analysis.

- *Applicant's Response: The applicant's response to fish passage and water quality concerns are addressed above under USEPA PN # 06-51 comments. The remaining issues have been addressed and are summarized below:*

1.) Sediment deposition – The applicant stated that the current design of the proposed project would not be expected to aggravate existing sedimentation problems. This assertion is based on the inflatable structure design, which is a continuous flow-through system that would be inflated during the summer months (3 to 4 months of the year), and during that time period the structure may be lowered due to high flows. Considering average daily flow data, the pool detention time would be approximately 3 hours. Therefore, the accumulation of increased sediment loads would not be expected to occur.

2.) Compensatory wetland mitigation – The applicant stated that a 1:1 mitigation replacement was submitted for permanent impacts. The mitigation plan includes 1.06 acres of wetland creation to mitigate for 1.03 acres of impacts (0.13 acre of permanent impacts

and 0.90 acre of seasonal impacts). In addition, monitoring of the seasonally inundated wetland areas would be included as a special condition of the permit. The applicant would be willing to post a performance bond or similar instrument to set aside funding for the construction and monitoring of mitigation sites if secondary impacts to seasonally inundated wetland areas were to occur.

3.) Lack of an adequate alternatives analysis – The applicant’s response to this issue has not changed. See applicant’s comments from PN # 05-42.

- *Corps Response: The Corps acknowledged and addressed USFWS’s comments in response to PN # 05-42 above. For comments relevant to this public notice (PN # 06-51), the Corps has considered and addressed USFWS’s comments in Public Interest Review Factors 7, 12, and 15.*

(3) Onondaga Nation

The Onondaga Nation is a Federally recognized Tribe. The Onondaga Nation provided comments on this proposed project in a letter dated October 3, 2007. The Onondaga Nation requested the Corps to begin consultation as soon as possible on this project. The Nation understands that the proposed project is currently in Phase II archaeology work and can arrange a Native American monitor for this sensitive area.

- *Applicant’s Response: To address compliance under Section 106 of the National Historic Preservation Act, the applicant agreed that the project has the potential to affect the Wyoming Valley Motors Prehistoric Site (36Wy271). However the applicant requested that a Phase II Survey be conducted as part of a Memorandum of Agreement (MOA) and that this MOA be incorporated into the permit conditions.*

- *Corps Response: The Corps has considered the Onondaga Nation’s comments in Public Interest Review Factor 6.*

c. State Agencies:

(1) State Historic Preservation Office (SHPO)

From PN # 05-42:

The Pennsylvania Historical and Museum Commission (PHMC) stated in a letter dated November 30, 2005, that there is a high probability that significant archaeological sites are located in the project area that could be adversely affected. A Phase I archeological survey of the project area would therefore be required to locate potentially significant archaeological resources.

In addition, PHMC stated that the Larksville Historic District and the River Street Historic District are properties listed in or eligible for the National Register of Historic Places and are

located near the project area. The activity, however, would have no effect on these properties.

- *Applicant's Response: To address Section 106 of the National Historic Preservation Act, a completed Phase I report and proposed Phase II work plan were submitted to PHMC on March 17, 2005. PHMC responded on January 12, 2006, in a letter stating that PHMC is in agreement with the proposed Phase II work plan. The applicant stated that as part of ongoing investigations, a memorandum of agreement (MOA) would be discussed between the USACE, SHPO and the applicant.*
- *Corps Response: The Corps has considered and addressed SHPO comments in Public Interest Review Factor 6.*

From PN # 06-51:

The PHMC stated in a letter dated October 5, 2006, that they have reviewed a Phase I geomorphologic reconnaissance and a Phase II work plan dated November 18, 2005. PHMC agreed with the conclusion that Phase II excavations are required if project impacts will have an effect on the Wyoming Valley Motors Prehistoric Site (36Wy271). The Phase II work plan presented at that time was consistent with the Guidelines for Archaeological Investigation (1991). At present, PHMC does not know the status of this investigation.

- *Applicant's Response: To address Section 106 of the National Historic Preservation Act, the applicant agreed that the project has the potential to affect the Wyoming Valley Motors Prehistoric Site (36Wy271). However the applicant requested that a Phase II Survey be conducted as part of a Memorandum of Agreement (MOA) and that this MOA be incorporated into the permit conditions*
- *Corps Response: The Corps has considered and addressed SHPO's comments in Public Interest Review Factor 6.*

(2) Pennsylvania Fish and Boat Commission (PAFBC)

From PN # 05-42:

The PAFBC stated in a letter, dated November 18, 2005, that there are several substantial outstanding issues that would need to be addressed by the applicant. They are outlined as follows:

1.) *Migratory fish passage for American shad* - The PAFBC was created in 1866 with a primary founding mission to halt the decline and initiate the restoration of American shad. Over-fishing and the construction of four hydrodams on the lower Susquehanna River (Conowingo, Holtwood, Safe Harbor, and York Haven) caused self-sustaining runs to cease early in the 20th century. With the opening of the York Haven dam fish way in 2000 and a planned fish way at the Fabri-Dam in Sunbury, American shad would be positioned to migrate 435 miles up the Susquehanna River to Binghamton, New York, for the first time in

100 years. This monumental achievement is now in jeopardy with the proposed dam at Wilkes-Barre.

The number of fish passed drops significantly with each obstruction they encounter; no fish way is as effective at passing American shad as a free-flowing river. Should it be built, the owners of the inflatable dam at Wilkes-Barre would be required by law to provide adequate fish passage. They would also be required to operate, maintain, and monitor the efficiency of the fish way indefinitely. Monitoring would include the actual counting of fish that pass through the fish way, conducting radio telemetry studies, modeling flow management with shad passage, and other techniques used to maximize use of the fish way. In cases where passage efficiency would be below target, the owner would be required to modify the fish way or build a new one.

High flows can reduce the effectiveness of, damage and even halt the operation of the existing fish ways on the Susquehanna River. Thus when flows are higher than average, fish ways do not operate as efficiently as under “average” conditions. PAFBC stated that in a free-flowing river without obstructions, shad will continue to move during high water events, but when blockages are in place, the pace of the run slows or stops. Delays at each structure that must be passed become cumulative, thereby decreasing the numbers of shad that would make it to the upper reaches of the river during the appropriate period and spawning conditions.

The Commission has been stocking American shad fry into the North Branch and the Chemung River for several years in an attempt to build a population of juveniles that ultimately return to spawn as far upstream as the New York portion of the North Branch. The Commission is also a member of the Susquehanna River Anadromous Fish Restoration Cooperative (SRAFRFC). SRAFRFC have spent millions of dollars to restore anadromous fish runs to the Susquehanna River. While proponents of this proposed dam envision local benefits, the potentially negative impacts to a multi-jurisdictional restoration program would be regional in nature and far reaching. Construction of yet another impediment to shad migration would deny the citizens of New York and northern Pennsylvania the right to their natural heritage and would also impact recreational anglers and the ecology of the Susquehanna River Basin downstream of the dam.

2.) *American eel* – PAFBC stated that similar to the American shad, placing yet another obstruction in the migratory pathway of American eels would adversely impact their populations in the North Branch of the Susquehanna River. Eels typically do not use fish ways that are constructed for shad; thus, additional modifications and costs would be required to address eel passage.

3.) *Resident Fish Passage* – There is considerable documented movement of recreationally and economically important resident fishes such as smallmouth bass and walleyes. Tagging studies conducted by Ecology III have shown that walleye travel considerable distances throughout the North Branch where they are a staple of the recreational fishery. Healthy resident fisheries occur when a species is able to access specific habitat types at certain times of the year to meet temperature, spawning, foraging, or flow needs. Blockages that slow or

stop movement are often detrimental to fish populations as there can be abnormally high concentrations of fish in restricted area thus making them more vulnerable to stresses such as overcrowding, increased angling pressure, or pollution events. Likewise, smallmouth bass tagging studies by the PAFBC on the Juniata River have shown that smallmouths can travel as far as 60-70 miles between spawning and foraging habitats. PAFBC does not fully understand where all of those areas may be in the North Branch. Thus, an assessment of the impacts to the very important smallmouth bass and walleye populations should be conducted as part of the impact assessment phase of this project. This would require the use of radio telemetry gear and the studies would need to be conducted over the course of at least one full year both prior to and after construction. The walleye and smallmouth fisheries are the foundation of the North Branch's fishing opportunities. Because of the extensive within-river migrations of these species there would be the potential for significant damage to this resource throughout many miles of the river. Consequently, the impact area to be evaluated would include more than just the actual footprint of the proposed dam and impoundment.

3.) *Water quality concerns* – There are dozens of CSOs throughout the Wyoming and Lackawanna Valleys. During summertime storm events, millions of gallons of untreated sewage are discharged into the North Branch. PAFBC stated that placing a dam across the river to trap, slow down, and concentrate these wastes would not bode well for water quality within the proposed impoundment. It is likely that unsightly and oxygen-depriving algae blooms would become a frequent occurrence under impounded conditions. Creating an impounded area which would directly receive concentrations of nutrient-laden inflows would set the stage for localized algae blooms, oxygen depletions, and probable fish kills when the appropriate conditions develop.

In addition, PAFBC stated that the impacts to water quality in the proposed impoundment due to the accumulation of sediments would need to be evaluated and compared to free-flowing conditions. An evaluation of metals and toxins presently in the North Branch and the potential to concentrate them within a new impoundment should also be conducted.

4.) *Freshwater Mussel Populations* – PAFBC stated that an evaluation of mussel resources should be conducted as part of the evaluation of project impacts. If mussels are present, consideration must be given to the impact that blockage to migration would have on the movements of host fishes. Freshwater unionid mussel distribution can only occur in an upstream manner when parasitic mussel larvae (known as glochidia) are able to attach to the appropriate fish host and be transported upstream. Eventually, they fall off the host fish, settle to the bottom and transform into miniature mussels. Adding a blockage to upstream migration would severely limit upstream mussel re-colonization. In addition, fish ways designed to pass shad are often not suitable for passing smaller host fish species.

5.) *Wetland Impacts* - There would be impacts to approximately 10 acres of riverine, palustrine, and forested wetland habitat within the proposed impounded area. The Commission recommended that impacts to these wetlands should be avoided. If impacts cannot be avoided, all attempts to minimize impacts should be made and appropriate mitigation provided.

6.) *Boating Opportunities* – PAFBC stated that with the addition of a dam, pass-through (canoes, kayaks) boating would be eliminated. In addition, based upon water quality concerns, it is possible that the public would not be attracted to boating on the proposed impoundment. It should not be assumed that boating use would significantly increase. Thus, a study to determine anticipated use should be conducted before projecting economic benefits.

Summary – PAFBC stated that impounding a river with existing water quality problems and expecting that the public would suddenly find such an area attractive or conducive to their water-based pastimes would likely result in disappointment. Indeed, the river already provides economic opportunities as boaters and anglers need food, fuel, supplies, lodging, etc. while they participate in water sports under existing conditions. Restoring shad runs would lead to an increase in recreational fishing opportunities. Improving water quality so that resident sport fish populations thrive would also increase recreational use.

PAFBC stated that the potential negative impacts of this project extend far upstream and downstream from Wilkes-Barre and the Wyoming Valley. Fishing opportunities and economic benefits would be impacted not only in Pennsylvania but further upstream in New York. PAFBC would urge the Corps to fully consider the ripple effect that stopping or slowing fish movement would have through-out the region and beyond. Based on review of the available information, knowledge of the fisheries and river conditions, and the potential for long-term adverse impacts, the PAFBC urges the Corps not to issue a permit for this project. If the applicant wishes to move forward with this project, PAFBC would recommend that an EIS be prepared to address all of the concerns previously noted.

- *Applicant's Response: The applicant's response to boating opportunities and wetland impacts are addressed below. The remaining issues have already been addressed and are summarized above under the applicant's response to USEPA and USFWS PN #05-42 comments.*

1.) *Boating - To address the issue of loss of pass-through boating opportunities, the applicant stated that they will provide a portage ramp along the northern end of the structure for easy access. In addition, the number of boaters who currently use this portion of the river would increase because the impoundment would create a more consistent recreation pool. The pool area would be a "no wake" zone and would be subject to PAFBC regulations.*

2.) *Wetland mitigation – The applicant stated that the proposed project was designed to avoid and minimize permanent impacts to wetlands; all permanent impacts to wetlands will be adequately mitigated. A mitigation plan was prepared for the 1.06 acres of unavoidable impacts.*

- *Corps Response: The Corps acknowledges PAFBC's request for additional tagging and radio telemetry studies for the current smallmouth bass and walleye populations; this study would assist PAFBC in assessing the impacts to the smallmouth bass and the walleye populations. The applicant has not provided this study requested in PAFBC's November 15,*

2005, letter. The Corps also acknowledges PAFBC's request for a study to determine the anticipated boating usage to assist in the projected economic benefits of this proposed project. The applicant has not addressed the anticipated economic benefits to the boating community requested in PAFBC November 18, 2005, letter. Lastly, the Corps acknowledges PAFBC's request for an evaluation of metals and toxins presently in the North Branch of the Susquehanna River; this evaluation would assist PAFBC in assessing impacts in the proposed impoundment due to the accumulation of sediments. The applicant has not provided an evaluation of metals and toxins as requested in PAFBC November 18, 2005, letter.

The Corps has considered and addressed PAFBC's comments in Public Interest Review Factors 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 15, 17, and 20.

The Corps acknowledges PAFBC's request for permit denial and recommendation for an EIS if the Corps decides to move forward with the proposed project.

From May 1, 2006 Public Hearing:

PAFBC continues to oppose this proposed project. PAFBC stated that if built, the project would have negative impacts on migratory fish passage, including American shad and eels, resident fishes including smallmouth bass and walleyes and freshwater mussels. In addition, PAFBC stated that pass-through boating for fishing, kayaking, and canoeing would be eliminated. Impacts to water quality in the pool and downstream would affect fish, aquatic organisms, and the people who fish and boat in the waters.

In depth analysis of each one of PAFBC issues is discussed at length above and in the public interest review section of this document. The only statement made by PAFBC at the May 1, 2006, public hearing that was not brought forth above was:

“Statewide, the PAFBC has removed more than 65 dams in the last 12 years and has another 40 projects underway.”

The PAFBC (again) recommends that if this project is issued, that an EIS be completed.

- *Applicant's Response: At the May 1, 2006 Public Hearing, the applicant announced a major modification to the project as a result of the initial responses received. This revision was formalized in a revised permit submission, received by the District on August 17, 2006. The PAFBC's concerns have been addressed and are summarized above under the applicant's response to USEPA and USFWS PN # 06-51 comments.*
- *Corps Response: The Corps acknowledges PAFBC's concerns and addressed these concerns in the response to PN #05-42 and in Public Interest Review Factors 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 15, 17, and 20. In addition, the Corps acknowledges the PAFBC's concern of the regional and statewide dam removal initiative.*

From PN # 06-51:

The PAFBC stated in a letter, dated October 26, 2006, that the outstanding issues brought forth in their November 18, 2005, letter, are still valid concerns that have yet to be addressed by the applicant. The PAFBC's position on the proposed project remained the same; the best alternative for this project would be no dam and an EIS would need to be completed. The PAFBC made the following statements regarding the applicant's latest submission regarding operational flexibility:

- 1.) June 15th is too early as the 'cut-off' date for operational adjustments for anadromous fish passage; the beginning of July would be a more acceptable date.
- 2.) The elevation change from the actual structure foundation, supporting infrastructure, hydraulic alternations and elevated 'bump' on the river bottom would need to be evaluated to determine the impacts on shad and resident fish passage.
- 3.) Movement studies, using radio telemetry, would be needed for walleye and smallmouth bass to determine the impacts that operational flexibility would have on these species during critical spawning and foraging periods.
- 4.) If the project moves forward, a fish passage facility with a proper eel passage facility would need be included to address resident fish and American eel passage.
- 5.) New information from the U.S. Geological Survey (USGS) researchers about fish hosts for the *Elliptio complanata* mussel in the Susquehanna River has surfaced. The applicant noted this in their latest submission but did not note that the decline of the American eel (due largely to blocked migrations) is likely the cause of declining *E. complanata* populations in the Susquehanna River. This very recent information further supports the concern that fish passage for all fish species would need to be maintained.

The PAFBC stated that the outstanding concerns addressed in their November 18, 2005, letter are still valid concerns that have yet to be addressed by the applicant. These concerns (described earlier in this document) are as follows: water quality, migratory fish passage for American shad, wetland impacts, and loss of boating opportunities.

- *Applicant's Response: The applicant's response to loss of boating opportunities and impacts to native freshwater mussels are addressed and summarized below. The remaining issues have been addressed and are summarized above under the applicant's response to USEPA and USFWS PN # 06-51 comments.*

1.) *Boating and safety* – The applicant stated that the pool area would be a “no wake” zone and would subject to PAFBC regulations. Boat types encouraged and expected to use the pool include sculls, kayaks, canoes, small pontoon boats, john boats, and bass boats. Due to the narrow width and shallow depth of the river in the location of the proposed pool, boats not expected to be permitted include jet skis, power boats, sailboats, and large pontoon boats. Water skiing would not be permitted.

2.) *Economics* – To address the issue of comments relating to the structure having negative economic benefits to existing water recreation and to anglers targeting walleye and smallmouth bass fisheries, the applicant stated the following: Portage ramps would allow kayaks and canoes to safely navigate around the structure. Boating opportunities would be improved within the recreation pool by providing a consistent pool elevation during periods of low flow. The Wilkes-Barre crew team is in support of this project because the proposed structure would provide consistent river conditions for their daily practices. And to avoid the impacts to the local walleye and smallmouth bass fishery, the applicant stated that the Denil fish way design, having the same entrance and supplemental attraction flow system as the vertical-slot fish way designed for the inflatable dam at Sunbury, would allow fish passage.

3.) *Native freshwater mussels* – With the project revised to incorporate a Denil fish passageway and eel ladder, the applicant stated that the design would allow for effective passage of all fish species.

- *Corps Response: The Corps acknowledged and addressed PAFBC's comments in response to PN #05-42 above. The Corps acknowledges PAFBC's request for an evaluation to determine the impacts on shad and resident fish passage from the elevation change of the actual structure foundation (elevated 'bump'). The applicant has not addressed the elevation change of a 'deflated' structure foundation requested in PAFBC October 26, 2006, letter.*

For comments relevant to this public notice (PN # 06-51), the Corps has considered and addressed PAFBC's comments in Public Interest Review Factors 7, 11, and 17.

(3) New York State Department of Environmental Conservation (NY DEC)

From PN # 05-42:

NY DEC stated in a letter, dated December 10, 2005, that they are concerned with the potential negative impacts the dam would have to the ongoing effort to restore a self-sustaining population of American shad (*Alosa sapidissima*) in the New York portion of the Susquehanna River and to the migration of recreationally and ecologically important fishes.

Prior to the construction of dams in the lower Susquehanna River, spawning runs of shad supported seasonal commercial fisheries as far upstream as Binghamton, New York. Other historical accounts indicated American shad may have migrated as far upstream as Oneonta, New York – an additional 70 river miles. New York is a member of the SRAFRFC and has been working with its sister agencies in adjoining states and the USFWS to restore American shad throughout its entire former range. The Department would like to re-establish American shad as an ecological component in the New York waters of the Susquehanna River drainage, and ultimately establish a recreational fishery for these fish.

NY DEC stated that although a fish passage facility is part of the proposed dam project, avoidance would be far superior to mitigation when it comes to passing fish around migratory obstructions. There would be no guarantees that the proposed facility would

actually pass American shad or other fishes. Every dam with a fish passage facility would have the potential to delay or completely deter a percentage of the migration fish that encounter it. Cumulatively these delays would drastically reduce the percentage of shad that ultimately make it to the New York portion of the Susquehanna River. The addition of another obstacle in their path would only further impact fish migrations and population restoration efforts.

Another important game fish is the resident walleye (*Sander vitreum*). During an extensive tagging program in the 1990's, nearly a quarter of the walleye tagged in New York were subsequently captured by anglers in Pennsylvania. A significant portion of these fish were caught downstream of Wilkes-Barre; one of these walleye moved 240 miles downstream of the original tagging location. PAFBC stated that a dam in Wilkes-Barre would have the potential to impede normal migration patterns of walleye and impact the quality of the fishery in New York State. The Susquehanna River's recreational walleye fishery is one of the best in New York State and supports a modest but important segment of the local economy within the Binghamton Metropolitan Area.

- *Applicant's Response: The applicant's response to these issue are summarized above under USEPA, USFWS, and PAFBC PN # 05-42 comments.*
- *Corps Response: The Corps has considered and addressed NY DEC's comments in Public Interest Review Factors 1, 2, 4, 7, 13, and 20.*

From PN # 06-51:

NY DEC stated in a letter, dated November 3, 2006, that their position has not changed and that the outstanding issues brought forth in their December 10, 2005, letter are still valid concerns that have yet to be addressed by the applicant. The NY DEC made the following statement regarding the applicant's latest submission regarding operational flexibility:

Operational flexibility is not a proven technology and still does not address resident fish passage during the recreational period. Furthermore, without conducting telemetry studies, it would be impossible to determine whether the proposed operational flexibility would indeed allow shad to move upstream of the dam. This type of monitoring would need to be required if this project moves forth.

- *Applicant's Response: The applicant's response to these issues are summarized above under USEPA, USFWS, and PAFBC PN # 06-51 comments.*
- *Corps Response: The Corps acknowledged and addressed NY DEC's comments in response to PN # 05-42 above. For comments relevant to this public notice (PN # 06-51), the Corps has considered and addressed NY DEC's comments in Public Interest Review Factor 7.*

(4) Pennsylvania Game Commission (PGC)

From PN # 05-42:

PGC stated in a letter, dated December 9, 2005, that if this project is approved, the impacts to wetlands would need to be adequately addressed and a thorough wetland mitigation plan would need to be developed.

- *Applicant's Response: The applicant's response to this issue is summarized above under USFWS and PAFBC PN # 05-42 comments.*
- *Corps Response: The Corps has considered and addressed the PGC's comments in Public Interest Review Factors 4 and 5.*

d. Organizations and Individuals

Numerous comments from organizations and individuals were received in response to PN #05-42, PN #06-41, and from the May 1, 2006 Public Hearing. They are as follows:

PN # 05-42: In response to the public notice, dated October 10, 2005, which advertised an inflatable structure with a vertical slot fish way design, the Corps received 12 comments of support and 26 comments of opposition from individuals and organizations.

May 1, 2006 Public Hearing: In response to the Public Hearing, the Corps received 12 comments of support and 173 comments of opposition from individuals and organizations.

PN #06-51: In response to the public notice, dated October 4, 2006, which advertised an inflatable structure with an operational flexibility design, the Corps received no comments of support and 458 comments of opposition from individuals and organizations.

A summary of these comments from both proponents and opponents to the project can be found in Appendix A. A summary of the applicant's response (where appropriate) and a summary of the Corps response to these comments can also be found in Appendix A.

e. Additional Coordination of Project Revisions

Another revised permit submission was received by March 28, 2007. The applicant stated that they would no longer use 'operational flexibility' to address fish passage, but would incorporate a Denil fish way design with an eel ladder. The applicant stated that this design would pass migratory fish and resident fish species with an eel ladder to pass American eel. The applicant still retained the concept of 'operational flexibility' as part of the project design, but only to meet recreational and environmental objectives, not to meet fish passage objectives. The project design now included an inflatable structure with a Denil fish passage facility, an eel ladder, and 'operational flexibility'. Since the impacts to jurisdictional waters of the U.S. (waters and wetlands) did not change substantially, the Corps determined that a 3rd public notice was not necessary. The Corps did however request technical resource agency input regarding the new fish passage proposal. In e-mails dated February 5, 2007, April 16, 2007, and then again on September 12, 2007, the Corps requested input from the USFWS, the PAFBC, and the NY DEC. The Corps requested technical responses not only

on the revised permit submittal but also on subsequent information the applicant provided to the Corps in relation to the effectiveness of the Denil fish way and the eel ladder, temperature data, and American shad passage data. The comments received from these three (3) technical resource agencies are summarized below:

1.) *Denil fish way and eel ladder* – All three technical resource agencies (USFWS, PAFBC, and NY DEC) stated that the Denil fish way would be inadequate to meet the long term goals of the SRAFRFC. In addition, USFWS stated that under current conditions, the Denil design is undersized (USFWS, May 16, 2007). The eel ladder design could not be fully evaluated as design detail requested by the Corps (as per USFWS, May 16, 2007, letter), was not provided by the applicant.

2.) *Temperature data and American shad migration* – The applicant concluded that American shad concerns (migration and passage) should not be considered in the permit evaluation because they indicated that shad do not migrate when water temperatures rise above 70 degrees F downstream. The applicant has proposed to inflate the structure when the water temperature exceeds 70 degrees F downstream. The three technical resource agencies (USFWS, PAFBC, and NYDEC) maintained that the temperature data do not support the applicant's conclusion. Specifically, 70 degrees F is not a limiting temperature for Shad movement, and even the highest temperature recorded by the USGS during the migration period was still well within the range of temperatures where successful movement and spawning is known to occur.

The comments received on these issues from USFWS, PAFBC, and NYDEC were provided to the applicant on May 22, 2007. The Corps also held two meetings with the applicant (May 22, 2007 and June 12, 2007) to coordinate and discuss these issues.

- *Applicant's Response: The applicant responded to these issues on August 24, 2007 and August 31, 2007. Summarization of these issues continued to state that the applicant disagrees with the UFSWS, PAFBC, and NY DEC on temperature data and American shad migration. Information requests that the applicant did not respond to included fish way and eel ladder design specifics. The applicant believed that these concerns can be addressed during the final design stage of the project and that should the project proceed, regular input from the resource agencies will be sought at that time. (Gannett Fleming, Inc., August 24, 2007).*

- *Corps Response: The Corps concurs with the USFWS, PAFBC, and NY DEC on the issues described above. The Corps concurs that the Denil fish way design is inadequate to meet the long term goal of SRAFRFC. The Corps also concurs that American shad can successfully reach the upstream reaches above Wilkes-Barre, and further into New York, without being encumbered by higher water temperature during the migration period. The Corps has considered and addressed the technical resource agencies comments in Public Interest Review Factor 7.*

The Corps also held an inter-agency meeting with USFWS and PAFBC (NYDEC could not attend) on October 15, 2007, to discuss the issues relating to Denil fish way, eel passage,

temperature data, and American shad migration. The resource agencies and the Corps agree that the Denil fish way design would be inadequate to meet the long term goals of SRAFRFC. The resource agencies and the Corps agree that American shad can successfully reach the upstream reaches of Wilkes-Barre, and further into New York, without being encumbered by high water temperature during the migration period.

VIII. Alternatives Analysis:

The Corps must evaluate alternatives pursuant to the NEPA and the CWA Section 404(b)(1) guidelines. These alternatives are developed in light of the overall project purpose as defined by the Corps in Section IV of this document.

1. Alternatives Eliminated by the Applicant (May 2000 Feasibility Study):

The applicant's feasibility study relied upon the same ten evaluation criteria used originally by the Corps in its 1991 Reconnaissance Report. Both the Corps Reconnaissance Report (1991) and the applicant's feasibility study (2000) evaluated 'structural alternatives' sites along a 16-mile stretch of the Susquehanna River from the Borough of Pittston, PA, to the City of Nanticoke, PA. Ten evaluation criteria were established and applied to the site selection process. The objective was to identify a 'structural alternative' site which:

- (1) Improves public access and enjoyment of the Susquehanna River,
- (2) Takes advantage of existing facilities,
- (3) Minimizes construction costs,
- (4) Optimizes reservoir conditions,
- (5) Minimizes environmental impacts,
- (6) Minimizes impacts to cultural resources,
- (7) Minimizes impacts to drainage structures and pumping stations,
- (8) Maximizes economic development,
- (9) Maximizes proximity to public lands, and
- (10) Does not increase flood levels or negatively impact the flood control project.

The results of their evaluation found three suitable structure site locations. However, the overall rating of each evaluation criteria was found to be significantly better if located upstream of Richard Island. As a result, all other sites were eliminated by the applicant and the only site location considered was upstream of Richard Island with 3 'structure' height alternatives (11, 9.5, or 6.5 feet).⁸ The applicant's selected preferred alternative was a structure height of 9.5 feet.

2. Alternative WBIS locations:

Other Alternative 'Structure' sites were considered, but eliminated by the USACE 1991 Reconnaissance Report for the Wyoming Valley Inflatable Structure. The Corps 1991 Reconnaissance Report evaluated all potential sites for a structure on the Susquehanna River

⁸ The 1991 Reconnaissance Report details the criteria used to eliminate alternate locations. For the purposes of this alternatives analysis, we accept elimination of those alternative site locations and agree that the location of the structure upstream of Richard Island is acceptable.

from the Borough of Pittston southwest to the City of Nanticoke. For the reasons stated in that report the following sites were eliminated from further consideration:

- (1) Upstream of the Market Street Bridge.
- (2) Between the Market Street Bridge and the Wilkes-Barre connecting railroad bridge.
- (3) Near Plymouth.
- (4) Vicinity of Nanticoke at the downstream end of the Wyoming Valley.
- (5) Abandoned Delaware and Hudson (D&H) Railroad Bridge site.

3. Alternatives Evaluated in this Environmental Assessment:

For purposes of a permit application the Corps advised the applicant, through multiple letters (April 21, 2003; July 21, 2003; February 17, 2004; May 6, 2005; February 3, 2006; and January 30, 2007) that their analysis of practicable alternatives must include non-impoundment alternatives. In addition, on May 22, 2007, the Corps assisted the applicant in developing the six alternatives that are evaluated in this document. These six alternatives comprise the appropriate range of practicable alternatives considered within the context of the 404(b)(1) alternatives analysis and NEPA review. The results of this analysis will determine whether or not the applicant's preferred alternative is the least environmentally damaging alternative in light of the basic and overall purpose, in accordance with the Section 404(b)(1) Guidelines.

In addition to the no action alternative, two non-structural alternatives and three structural alternatives were evaluated in the context of the 404(b)(1) analysis as well as the public interest review. The following alternatives were carried through for assessment in this document:

- (1) No Action Alternative.
- (2) Riverfront Development Plan.
- (3a) Inflatable Structure with Denil Fish Way.
- (3b) Inflatable Structure with Vertical slot fish way.
- (3c) Inflatable Structure with operational flexibility.
- (4) Inflatable Structure with Denil Fish Way plus Riverfront Development Plan.
- (5) Inflatable Structure with Denil Fish Way plus Riverfront Development Plan plus West Bank Riverfront Development Plan (applicant's preferred alternative).
- (6) Riverfront Development Plan plus West Bank Riverfront Development Plan.

Alternative 1. No Action Alternative

1.) Description of Alternative:

The No Action Alternative is the no build alternative or the "no-project" alternative. This baseline alternative is identified by retaining the river in its existing natural free-flowing state that encompasses features from the original Wyoming Valley Levee Raising Project and the maintenance of the existing five public parks: 1) Kirby Park, 2) Nesbitt Park, 3) Riverbend Park, 4) River Common Park, and 5) the downstream end of the Luzerne County Recreational Facility.

2.) Impacts:

This alternative would have no direct or indirect impacts to jurisdictional waters of the U.S., including wetlands. This alternative will have no adverse impacts to threatened and endangered species, known historic and cultural resources, riffle and pool complexes, anadromous fishes, resident fishes, native mussel species, American eel, benthic invertebrates, existing recreational uses, water quality, shore erosion and riparian habitat, or to the economy.

Although this alternative would not result in direct or indirect impacts to jurisdictional waters, including wetlands, the No Action alternative does not meet the overall project purpose as defined by the Corps.

Alternative 2. Riverfront Development Plan

1.) Description of Alternative:

The Riverfront Development Plan (RDP) alternative proposes enhancement features in and around the river, but does not include a structure across the river to impound water to create a seasonal recreational pool. The RDP will reconnect downtown Wilkes-Barre to the Susquehanna River through improved public access and increase waterfront recreational opportunities (USACE, Final RDP SEIS, 2005). The RDP alternative would also help to reclaim the river as a civic resource for the daily life of residents and visitors, as well as make the river a unique amenity for the city.

As identified in the Corps 2005 Final Supplemental Environmental Impact Statement (SEIS) for Design Modification and Recreational Enhancements to the Wyoming Valley Levee Raising Project at the Wilkes-Barre, Pennsylvania River Commons, this alternative proposes construction of two portals, a river landing, a fishing platform/dock, and an amphitheater and stage at the Wilkes-Barre riverfront. These features are further described below:

Portals - Approximately 60-foot wide and 12-foot high portals through the levee will provide pedestrian and emergency access to the Susquehanna River just upstream of the Market street Bridge and across from the Northampton Street and River Street intersection. During a flood, the portals would be closed with flood gates.

River Landing - Upstream of the Market Street Bridge, a River Landing will be constructed on the existing stability berm (approximately 900 feet long and 70 feet wide). When completed, this River Landing would create a concrete-surfaced, 1.2-acre riverfront plaza for waterfront events (e.g., concerts, 4th of July fireworks, art shows, ethnic food festivals, etc.). A concrete curb, or similar structure, at the edge of the river landing would provide for pedestrian safety. The River Landing would require limited re-grading, re-configuring, and a riverside expansion of the rock stability berm to accommodate project features.

Fishing Platform/Dock – Connected to the River Landing will be a 340-foot long by 12-foot wide fishing platform/dock. Access to the fishing platform would be via a ramp directly from the river landing and a set of stairs. The dock itself would not have permanent boat slips, but would have adequate fendering to provide a location where boats could temporarily tie-up for a few hours at a time (public landing). The feature would complement the existing boat launch in

Nesbitt Park, across the river in Kingston, by providing additional areas for public access for fishing and recreational boating.

Amphitheater and Stage - The amphitheater and stage would be constructed just downstream of the Market Street Bridge but upstream of the downstream portal. The amphitheater would consist of large stones or reinforced concrete blocks placed into the slope to provide bench seating for approximately 750 people. The majority of the rows would be below the riverside access road with one row of seats above the riverside access road. The performance stage would consist of a concrete slab placed on a layer of sub-base stone, on top of the existing rock fill berm.

Paved Riverside Access Road - At the completion of the levee raising and the Riverfront Plan, the riverside access road at the base of the riverside of the levee would be paved as an element to the riverfront development plan. The paving of this road would be an improvement for recreational purposes and provide a biking/jogging/walking trail along the riverside toe of the levee.

Miscellaneous Recreational Features- The flood control project, as designed and constructed throughout the Wyoming Valley, included recreational features in the basic design. This reach of the Wilkes-Barre levee would include similar recreational features such as lights, seating areas with benches, trees/vegetation, educational kiosks, and trash receptacles.

2.) Impacts:

This alternative would not result in impacts to wetlands. The RDP alternative would permanently impact 0.77 acre of the Susquehanna River associated with the construction of the berm extension, dug toe, and groins for the River Landing. These impacts were addressed in the 2005 RDP Final SEIS and supplemental July 2005 Errata Sheet (USACE, July 2005).

This alternative would not impact Federally listed threatened or endangered species or known historic properties. In addition, since no obstruction to the natural free flowing condition of the Susquehanna River at Wilkes-Barre is associated with this alternative, there would be no adverse impacts to riffle and pool complexes, anadromous fishes, resident fishes, native mussel species, American eel, benthic invertebrates, existing recreational river uses, water quality, shore erosion, and riparian habitat.

We have also evaluated whether this alternative has other overriding environmental impacts or concerns. The Corps has determined that this alternative would not result in other significant adverse impacts to uplands, floodplains, fish and wildlife, farmland, parks, threatened and endangered species, historic resources, and social/cultural resources. In addition to the permanent impacts to waters of the U.S. as described above, implementation of this alternative would result in only temporary and minor impacts to parkland. Therefore, in the context of Section 230.10(a), this alternative does not have other significant adverse environmental consequences.

This alternative will provide approximately \$14 million or 83% of the Regional Economic Development (RED) benefits defined by the applicant's preferred alternative. Although there

will be \$3.11 million less of RED benefits that may accrue from this alternative as compared to the applicant's preferred alternative, there are no anticipated issues of economic uncertainty associated with potential water quality issues.

The cost to implement this alternative is approximately \$22 million (2006 costs).

This alternative meets the overall project purpose as defined by the Corps.

Alternative 3a. Inflatable Structure Denil Fish Way

1.) Description of Alternative:

This alternative involves the construction of an inflatable structure, with a fully inflated height of 9.5 feet, which would maintain the water surface level of the pool near elevation 517 feet (NGVD 1929) from approximately Memorial Day to Labor Day every year. The structure would be located in the Susquehanna River, immediately upstream of Richard Island and the former Delaware and Hudson Railroad Bridge, Wilkes-Barre, Pennsylvania. The water surface elevation of the River in the vicinity of the Market Street Bridge would be raised approximately 4 feet higher than average during the period when the structure is inflated. The seasonal recreational pool would extend approximately 4.5 miles upstream from the structure. The width of the pool would vary between 550 and 1,000 feet. The average depth of the pool would be approximately 8-10 feet, with the deepest area more than 25 feet. This inflatable structure alternative incorporates a Denil fish way constructed along the north bank of the river and includes an eel ladder.

2.) Impacts:

This alternative would seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of valuable riffle and pool complexes. This seasonal inundation of riffle and pool complexes will destroy the high diversity of these systems during what is typically a critical period for many aquatic organisms that are spawning, foraging and in need of shallow nursery areas. This alternative will permanently impact approximately 1.73 acres of river bottom (Susquehanna River) and 1.03 acres of palustrine forested (PFO) wetlands. This alternative will temporarily impact 2.81 acres of river bottom (Susquehanna River) and 0.92 acre of PFO and palustrine emergent (PEM) wetlands. The potential exists for permanent, indirect impacts of up to approximately 13.0 acres of PFO and PEM wetlands that currently exist channelward of the ordinary high water shoreline, within the banks of the proposed pool limits. The 13 acres of wetlands could be indirectly impacted through increased and continuous inundation and/or saturation of their root zone during the recreational season. The extent of the indirect impacts depends on the elevation of the existing wetlands relative to the proposed 517 pool elevation and the ability of the existing vegetation to withstand months of continuous saturation or inundation during the growing season. The applicant has acknowledged that wetlands within the pool limits may be indirectly impacted and has offered monitoring and, in the case of wetland losses, mitigation.

According to USFWS's May 16, 2007, letter, the Denil fish way passage facility design is expected to pass about 20,000 shad per run. This is only 2% of SRAFR's goal of 900,000 shad

per run expected to arrive in the Wilkes-Barre area in the Susquehanna River by 2025. The future projected shad numbers are based on the documented increased numbers of shad that have arrived in this portion of the river through past efforts; expected increases through the ongoing efforts of the SRAFRFC. The SRAFRFC efforts include future proposed improvements at all of the hydropower dams located downstream as part of the relicensing process and retrofitting of the downstream Fabri-Dam at Sunbury (which also has inflatable bags).

This alternative would not impact Federally listed threatened and endangered species. It would have adverse impacts to known historic properties.

It will also impound 4.5 miles of naturally free-flowing river; and will have adverse impacts to known historic and cultural resources, riffle and pool complexes, wetlands, anadromous fishes, resident fishes, native mussel species, American eel, benthic invertebrates, existing recreational river uses, water quality, shore erosion and riparian habitat, and safety.

Water quality in the Susquehanna River in the vicinity of Wilkes-Barre is periodically degraded by CSO. According to the applicant, “there are currently 16 CSO outfalls within the limits of the proposed impoundment, with an additional 23 CSO outfalls upstream between Forty Fort and West Pittston” (Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-14). An additional 103 CSOs discharge into the Lackawanna River, a tributary to the Susquehanna River about nine miles upstream of the proposed structure (USEPA, November 2005, pg.1). The applicant also indicates that “the success of either Option 2 (Inflatable dam with limited landside improvements) or Option 3 (the inflatable dam with significant recreational facilities and enhanced landside access) is based on the assumption that the CSO problem is corrected” (Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-24). A major concern associated with CSOs is the attraction of people to the impoundment and consequent increased potential for exposure to contaminants contained in the CSOs, particularly potential pathogens. Analysis of the applicant’s fecal coliform data below indicates the severity of this concern.

The applicant’s consultant performed a water quality study in 2004 (Gannett Fleming, Inc., May 2005 -Appendix G). They sampled 11 stations approximately monthly from May 2004 through November 2004. Four of the water quality sampling stations were in the area of the proposed pool – stations 002, 003, 004 and Tang Creek.

One of the parameters that the applicant’s consultant sampled and analyzed was fecal coliforms. This is a significant parameter, because it is an indicator of the suitability of water quality for swimming. The PADEP maximum fecal coliform level during the swimming season (May 1 through September 30) is the geometric mean of 200 per 100 milliliters (ml) based on a minimum of five consecutive samples; each sample collected on different days during a 30-day period. PADEP standards also require no more than 10% of the samples taken during a 30-day period may exceed 400 per 100 ml. While multiple samples were not collected and analyzed in any single 30-day period at any single location, it is instructive to review the available data in light of the 200 per 100 ml and 400 per 100 ml limits.

Data in Gannett Fleming, Inc., May 2005, for the four stations within the proposed pool from May 1 through September 30, 2004, show that:

- Twenty-one total samples were taken.
- Fourteen of these samples or 67% exceeded 200 per 100 ml.
- Ten of these samples or 48% exceeded 400 per 100 ml.

Gannett Fleming, Inc., indicated that the September 24, 2004, data were a reflection of the impacts of Hurricane Ivan on water quality and might not be representative of water quality under “normal” swimming season conditions. Re-analysis of these data without the September 24, 2004 sampling data shows that:

- Eighteen total samples were taken.
- Eleven of these samples or 61% exceeded 200 per 100 ml.
- Seven of these samples or 39% exceeded 400 per 100 ml.

Even using the re-analyzed data above, under the without project condition, the suitability of water quality for swimming is, at a minimum, extremely questionable based on the above-cited data. Existing water quality for swimming, using fecal coliforms as a metric, is not expected to improve with construction of the applicant’s preferred alternative and could be exacerbated due to reduced water velocities that would reduce mixing. Further, the mere presence of more quiescent waters with a stable water level would attract people to the water for swimming. The applicant has proposed to monitor water quality and provide notice of water quality problems to the public, in order to partially mitigate these impacts (Gannett Fleming, Inc., July 2006, pg. 44-48; Gannett Fleming, Inc., March, 2007, pg. 29). However, even with the proposed mitigation measures, the applicant’s preferred alternative is more likely than not, to increase adverse public health impacts as compared to the without project condition and as compared to any of the alternatives that do not involve an impoundment.

In addition to pathogens, CSOs may impair water quality for recreational uses due to suspended solids and turbidity.

The applicant has proposed to use operational flexibility to mitigate water quality concerns associated with CSOs. The PADEP indicates that “The assertion in the application that the dam is likely to be deflated when CSO loading of fecal coliform is maximized is inadequate to assure protection of the public and recreational water uses” (PADEP, November 16, 2006, pg. 2). The PADEP is “particularly concerned with the dynamic condition resulting from a thunderstorm following a period of extended dry weather when river flow is low” (PADEP, November 16, 2006, pg. 2).

Despite the applicant’s own assertion that the success of the inflatable structure “...is based on the assumption that the CSO problem is corrected...”, at this time, the Corps is aware of only two (2) CSOs currently being eliminated. The two CSOs will be eliminated by the WVSA (WVSA, May 1, 2006, pg.1).

The Corps concludes that the proposed impoundment will have a negative adverse impact on water quality for recreational uses involving water contact.

This alternative may provide approximately \$3.11 million or 17% of the RED benefits defined by the applicant's preferred alternative. These benefits, however, are uncertain given potential impacts that could arise from water quality issues.

The cost to implement this alternative is estimated at approximately \$19.7 - \$23.4 million (2006 costs).

This alternative meets the overall project purpose as defined by the Corps. However, it will have other significant adverse environmental consequences as discussed in further detail in the additional assessment factors in this alternatives analysis.

Alternative 3b. Inflatable Structure with Vertical Slot Fish Way

1.) Description of Alternative:

This alternative is an inflatable structure with a vertical slot fish way passage. The vertical slot fish way passage is proposed to be located along the north bank of the river and will include a twelve (12) pool vertical slot serpentine fish passage facility.

2.) Impacts:

This alternative would seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of valuable riffle and pool complexes. This seasonal inundation of riffle and pool complexes will destroy the high diversity of these systems during what is typically a critical period for many aquatic organisms that are spawning, foraging and in need of shallow nursery areas. This alternative will permanently impact approximately 1.79 acres of river bottom (Susquehanna River) and 1.06 acres of palustrine forested (PFO) wetlands. This alternative will temporarily impact 3.68 acres of river bottom (Susquehanna River) and 0.89 acre of PFO and palustrine emergent (PEM) wetlands. The potential exists for permanent, indirect impacts of up to approximately 13.0 acres of PFO and PEM wetlands as a result of seasonal pool inundation of water elevation at 517 feet. This can occur due to the effects of 'capillary fringe' saturation of soils above the 517 foot elevation in those areas where there is currently less frequent saturation.

The vertical slot fish way is more suited to larger waterways, like the main stem of the Susquehanna River than the Denil Fish way (USFWS, May 16, 2007). However, this fish way passage is still determined to be inadequate for shad, eel, and the passage of resident fishes and the dependent native mussel population for multiple reasons discussed in Public Interest Review Factor 7.

Except for wetland impacts, stream impacts and anadromous fish impacts, the impacts of this alternative are the same as those described in alternative #3a above. The impacts to anadromous fish, specifically to American shad, will be greater with a Denil fish way versus a vertical slot fish way. A Denil fish way is designed to pass 20,000 American shad in a passage season while

a vertical slot fish way is designed to pass 600,000 American shad in a passage season. The water quality impacts described in Alternative 3a will also exist under this alternative.

This alternative would not impact Federally listed threatened and endangered species. It would have adverse impacts to known historic properties.

This alternative may provide approximately \$3.11 million or 17% of the RED benefits defined by the applicant's preferred alternative. These benefits, however, are uncertain given potential impacts that could arise from water quality issues.

The cost to implement this alternative is estimated at approximately \$21.7 - \$26.4 million (2006 costs).

This alternative meets the overall project purpose as defined by the Corps. However, it would have other significant adverse environmental consequences as discussed in further detail in the additional assessment factors in this alternative analysis.

Alternative 3c. Inflatable Structure with Operational Flexibility

1.) Description of Alternative:

This alternative is an inflatable structure at the same location but utilizes "operational flexibility" as a technique for fish passage. Operational flexibility is the term used to describe potential adjustments to the height of the structure as a result of various flow conditions or events to facilitate fish passage.

2.) Impacts:

This alternative will seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of valuable riffle and pool complexes. This seasonal inundation of riffle and pool complexes will destroy the high diversity of these systems during what is typically a critical period for many aquatic organisms that are spawning, foraging and in need of shallow nursery areas. This alternative will permanently impact approximately 1.63 acres of river bottom (Susquehanna River) and 1.03 acres of palustrine forested (PFO) wetlands. This alternative will temporarily impact 2.69 acres of river bottom (Susquehanna River) and 0.92 acre of PFO and palustrine emergent (PEM) wetlands. The potential exists for permanent, indirect impacts of up to approximately 13.0 acres of PFO and PEM wetlands as a result of seasonal pool inundation of water elevation at 517 feet. This can occur due to the effects of 'capillary fringe' saturation of soils above the 517 foot elevation in those areas where there is currently less frequent saturation.

The District has determined that this is not an acceptable method of fish passage, especially for American shad, because of their inability to navigate both the height differential and flow velocity that are proposed; this is discussed in greater detail below.

Except for wetland impacts, stream impacts, and anadromous fish impacts, the impacts of this alternative are the same as those described in Alternative 3a. The water quality impacts described in Alternative 3a will also exist under this alternative.

This alternative would not impact Federally listed threatened and endangered species. It will have adverse impacts to known historic properties pursuant to Section 106 of the National Historic Preservation Act.

This alternative may provide approximately \$3.11 million or 17% of the RED benefits defined by the applicant's preferred alternative, meeting the overall project purpose as defined by the Corps. These benefits, however, are uncertain given potential impacts that could arise from water quality issues.

The cost to implement this alternative is estimated at approximately \$18 - \$22 million (2006 costs). No additional costs for operational flexibility were provided by the applicant.

Therefore, this alternative meets the overall project purpose as defined by the Corps. However, it will have other significant adverse environmental consequences as discussed in further detail in the additional assessment factors in this alternative analysis.

Alternative 4. Inflatable Structure/Riverfront Development Plan (RDP)

1.) Description of Alternative:

This alternative combines those features described for the Inflatable Structure (with a Denil Fish way), with those described for the Riverfront Development Plan. Please refer to alternative #2 and alternative #3a above for each description.

2.) Impacts:

This alternative would seasonally inundate 4.5 miles of a large, free-flowing river system by impounding the river with an inflatable structure and it will seasonally inundate 13.35 acres of riffle and pool complexes, which are identified in 40 CFR 230.45(a) as particularly valuable habitat for fish and wildlife. This seasonal inundation of riffle and pool complexes will destroy the high diversity of these systems during what is typically a critical period for many aquatic organisms that are spawning, foraging and in need of shallow nursery areas. This alternative will permanently impact approximately 2.50 acres of river bottom (Susquehanna River) and 1.03 acres of palustrine forested (PFO) wetlands. This alternative will temporarily impact 2.81 acres of river bottom (Susquehanna River) and 0.92 acre of palustrine emergent (PEM) and PFO wetlands. The potential exists for permanent, indirect impacts of up to approximately 13.0 acres of PFO and PEM wetlands as a result of seasonal pool inundation of water elevation at 517 feet. This can occur due to the effects of 'capillary fringe' saturation of soils above the 517 foot elevation in those areas where there is currently less frequent saturation.

This alternative would have all of the impacts associated with Alternative 2 and Alternative 3a, and therefore have greater acreage of stream impact. Except for stream impacts, the impacts of this alternative are the same as those described in Alternative 3A.

This alternative would not impact threatened and endangered species. It will have adverse impacts to known historic properties pursuant to Section 106 of the National Historic Preservation Act.

This alternative may provide approximately \$17.89 million (\$14.78 million for the RDP plus \$3.11 for the inflatable structure) in RED benefits defined by the applicant's preferred alternative, meeting the overall project purpose as defined by the Corps. However, \$3.11 million, or 17% of these benefits, are uncertain given projected impacts that could arise from water quality issues.

The cost to implement this alternative is estimated at approximately \$41.7 - \$45.4 million (2006 costs). This cost reflects the \$22 million for the RDP and between \$19.7 - \$23.4 million for the inflatable structure with Denil fish way.

This alternative meets the overall project purpose as defined by the Corps. However, it will have other significant adverse environmental consequences as discussed in further detail in the additional assessment factors in this alternative analysis.

Alternative 5. Inflatable Structure/ Riverfront Development Plan (RDP)/West Bank Riverfront Development Plan

1.) Description of Alternative:

This alternative combines the West Bank Riverfront Development Plan (described below) with those features described for the Riverfront Development Plan and the Inflatable Structure Denil Fish Way. This alternative is the applicant's preferred alternative. Please refer to Alternative #2 and Alternative #3a, above for descriptions of the Riverfront Development Plan and Inflatable Structure with Denil Fish Way, respectively.

The West Bank Riverfront Development Plan is described as follows:

In addition to the December 20, 2000, Master Plan completed by Sasaki Associates, Inc., for the east bank of the River (known as the Sasaki Plan), the Luzerne County Flood Protection Authority developed a West Bank Riverfront Plan to implement improvements to existing parks on the east side of the River to augment the level of recreational opportunities offered within the Wyoming Valley Region. This West Bank Riverfront Development Plan is located within three local municipalities (Wilkes-Barre, Kingston, and Edwardsville) and involves project implementation in five (5) phases:

- (1.) Kirby Park improvements upland of the Wyoming Valley Levee.
- (2.) Kirby Park improvements riverside of the Wyoming Valley Levee.
- (3.) Nesbitt Park, riverside of the Wyoming Valley Levee.
- (4.) Riverbend Park, riverside of the Wyoming Valley Levee up to the Kingston Recreational Center.
- (5.) Riverbend Park, riverside of the Wyoming Valley Levee upriver of the Recreational Center.

Examples of what the West Bank Riverfront Development Plan include, but are not limited to the following: construction of a three-story nature center building; new paved trails; two additional boat launch areas; floating docks (total of 1,920 square feet); additional picnic areas; additional

parking; planting of native grasses, shrubs, flowers, etc; river ecology study area; access stairs over the Levee; wetland observation deck; wildlife habitat sanctuary; site furnishings (benches, trash receptacles, fencing); and improvements in lighting, signage/graphics/kiosks, etc.

The West Bank Riverfront Development Plan will have no impact to wetlands but will have permanent impacts to 0.14 acre of the Susquehanna River associated with the construction of two (2) boat launches, and 1,920 square feet of floating docks.

2.) Impacts:

This alternative would have the combined impacts of Alternative 2 and Alternative 3a, and, in addition, will have permanent impact to an additional 0.14 acre of the Susquehanna River.

Since the RED benefits for the West Bank Riverfront Development Plan component of this alternative were not calculated, the Corps concludes that RED benefits will be greater than \$17.89 million (\$14.78 million for the RDP plus \$3.11 million for the inflatable structure) for this alternative, meeting the overall project purpose as defined by the Corps. However, \$3.11 million, or 17% of these benefits, are uncertain given projected impacts that could arise from water quality issues.

The cost to implement this alternative is estimated at approximately \$55.2 - \$58.9 million (2006 costs). This cost reflects the \$22 million for the RDP; between \$19.7 - \$23.4 million for the inflatable structure with Denil fish way; and \$13.5 million⁹ for the West Bank Riverfront Development Plan.

This alternative meets the overall project purpose as defined by the Corps. However, it will have other significant adverse environmental consequences as discussed in further detail in the additional assessment factors in this alternatives analysis.

Additional Assessment Factors Related to all Three Structural Alternatives (#3 - #5)

Potential aquatic impacts for the three structural alternatives are discussed below in greater detail, as well as in various sections of the Public Interest Review Factors analysis.

1.) Fish and Wildlife – All of the structural alternatives will negatively impact resident fishes, native mussels, and benthic communities (within the pool), as well as the expected movement of American shad and river herring (anadromous finfish) and eel populations. Any proposed structure will also have minimal negative impacts to migratory birds, including the Peregrine falcon.

Anadromous finfish:

Due to their economic importance and their historical use for human consumption, crab bait, fish meal and fish oil, there has been a significant cooperative effort that has been put forth to restore American shad populations, and to a lesser extent river herring, in the Susquehanna River. The cooperating parties include the USFWS, the National Marine Fisheries Service (NMFS), the Susquehanna River Basin Commission (SRBC), the PADEP, the PAFBC, the NY DEC, and the

⁹ E-mail from applicant's consultant Gannett Fleming, Inc., dated July 19, 2007.

Maryland Department of Natural Resources (MD DNR), as well as utilities and citizens groups. This team of cooperating entities is referred to as the SRAFRC and it has committed over \$75 million over the last 40 years to rebuilding shad and river herring populations in the Susquehanna River. The restoration program goal is to reestablish an annual spawning population, in the Susquehanna River, of 2 million shad and 20 million herring by 2025, and to allow the migration of the American shad to its historical upstream limit (above Binghamton, New York) for the first time in 100 years.

Dams have blocked or impeded upstream migration of anadromous fish on main stem rivers. On the lower Susquehanna River, there are four hydropower dams and there is one “Fabri-Dam” in Sunbury approximately 65 river miles downstream of the proposed WBIS. The four hydropower dams are: Conowingo Dam, Holtwood Dam, Safe Harbor Dam, and York Haven (see Figure 2). There are 134 river miles between the uppermost hydropower dam at York Haven and the proposed Wilkes-Barre inflatable structure location.

All four hydropower dams currently have fish passage for both resident and anadromous finfish. Fish lifts (i.e., elevators) were constructed at Conowingo Dam in 1971 (west) and 1991 (east) at a cost of \$12 million, Holtwood Dam in 1997 at a cost of \$22 million and at Safe Harbor Dam in 1997 at a cost of \$16 million. A vertical slot fish way was constructed at York Haven Dam in 2000 at a cost of \$9 million. (PAFBC, November 18, 2005, pg.1). Total funds spent to date on construction of fish passage facilities at these structures is \$59 million.

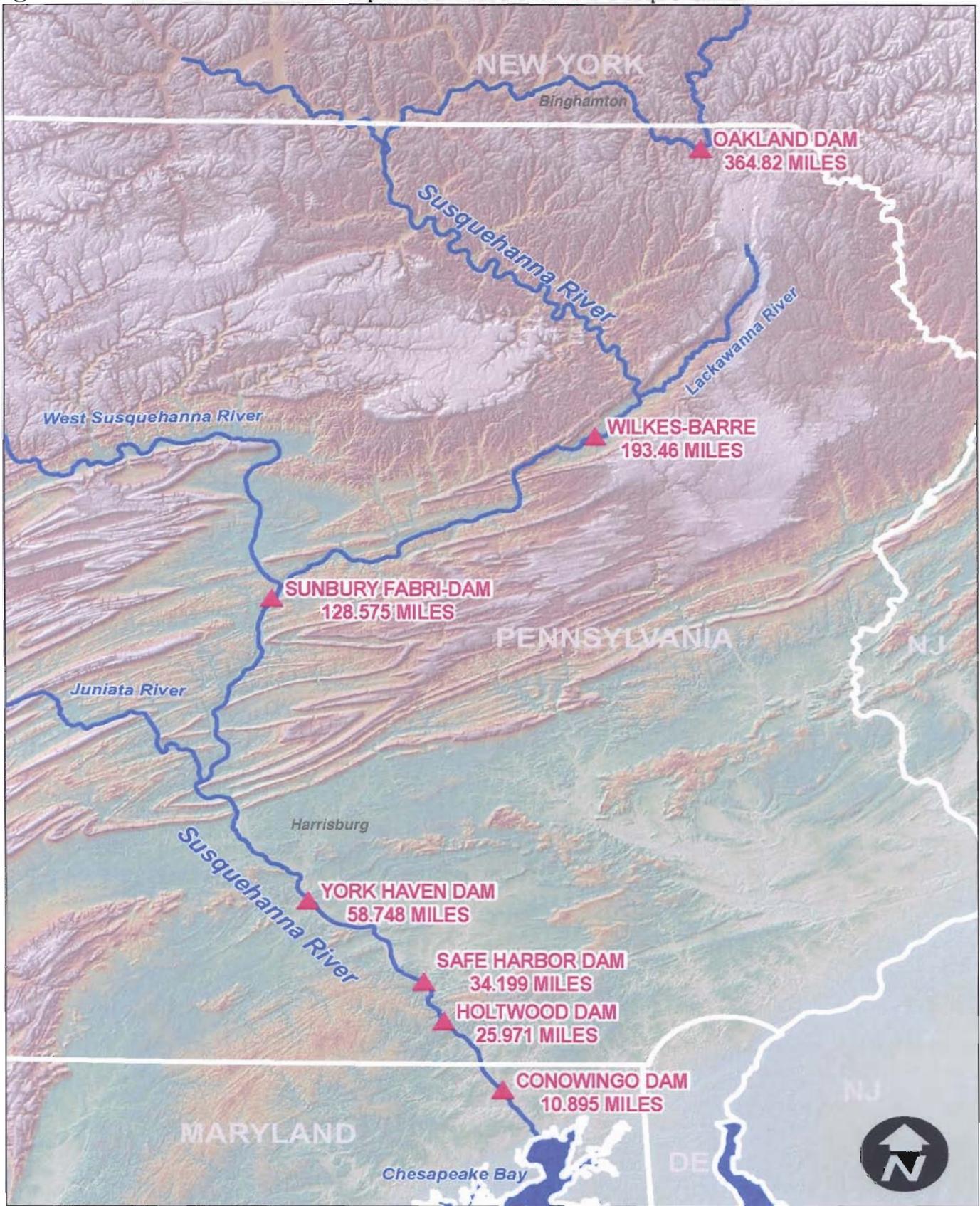
All four (4) of these hydropower dams will be required to provide additional improvements as part of Federal Energy Regulatory Commission (FERC) relicensing. Relicensing agreements are currently underway at Holtwood Dam and re-licensing will occur by 2014 at the other three dam facilities. (PAFBC, May 9, 2007, pg.1).

Table 1 indicates the current capacity for the first and last dams on the Susquehanna River to pass shad and the SRAFRC restoration goals for each of these dams.

Table 1. Current Shad Capacity and Shad Capacity after Relicensing		
Dam	Current Capacity	Capacity After Re-licensing
Conowingo Dam (1 st dam in series)	1.5 million shad	2.5 + million shad
York Haven Dam (last dam (4 th) in series)	500,000 shad	2.0 million shad
Source: USFWS, June 15, 2007		

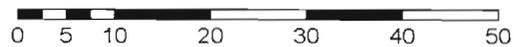
The Adam T. Bower Memorial Dam, (“Fabri-Dam” in Sunbury) currently does not have fish passage but will be retrofitted for fish passage with a vertical slot fish way to pass a minimum of 600,000 shad. The Adam T. Bower Memorial Dam is owned and operated by the Pennsylvania

Figure 2. Location of Dams and Proposed Structure on the Susquehanna River



SUSQUEHANNA RIVER

Scale in Miles



Department of Conservation and Natural Resources (PA DCNR) and is under State requirement to retro-fit this fish-passage (PAFBC, Executive Director, December 28, 2005, pg.2). Under Section 3501(a) of the PA Fish and Boat Code (30 Pa.C.S 3501(a)), a dam owner must erect *“such chutes, slopes, fish ways, gates, or other devices as the Commission may deem necessary to enable the fish to ascend and descend the waters at all seasons of the year.”* As such, there is already a completed fish way design (serpentine vertical slot) that will pass a minimum of 600,000 American shad (Gannett Fleming, Inc., May 2005 - Appendix D, pg. 4). A permit for such a facility (vertical slot fish way) was issued by the Baltimore District in 2003. The State legislature committed \$5.3 million to the PA DCNR; however, this commitment fell short of the lowest construction bid by approximately \$2 million (PA House of Representatives, February 15, 2007, pg. 2). A specific timeframe for completion cannot be provided at this time. The PAFBC has indicated that the requirement to retrofit is not negotiable, although they recognize that the cause for this delay has precluded construction to date (PAFBC, October 15, 2007). It is expected that a vertical slot fish passage facility will be constructed as required by PAFBC requirements and in keeping with the mandate and goals of the SRAFRFC.

The applicant proposed a Denil fish passage facility as part of the proposed inflatable structure. This passage capability (up to 20,000 shad annually) is inconsistent with /will not meet the long-term goals of the SRAFRFC goals (NY DEC, May 11, 2007, pg.1). The applicant's proposed Denil fish passage capacity is thirty times less than the passage capacity (600,000) planned for construction at the Sunbury Fabri-Dam.

The applicant concluded that American shad concerns (migration and passage) should not be considered in the permit evaluation because they indicated that shad do not migrate when water temperatures rise above 70 degrees F downstream. Therefore the applicant has proposed to inflate the structure when the water temperature exceeds 70 degrees F downstream (Gannett Fleming, Inc., January 2007, pg. 14-15). The three technical resource agencies (USFWS, PAFBC, and NYDEC) maintained that the temperature data do not support the applicant's conclusion. Specifically, 70 degrees F is not a limiting temperature for Shad movement, and even the highest temperature recorded by the USGS during the migration period was still well within the range of temperatures where successful movement and spawning are known to occur (PAFBC, February 22, 2007, pg 2; USFWS, April 10, 2007, pg. 1-2; NY DEC, March 1, 2007, pg. 1-2).

The Corps believes that authorizing the proposed inflatable structure at Wilkes-Barre on the main stem of the Susquehanna River without an adequate fish passageway to support SRAFRFC goals would negate the viability of past and reasonably foreseeable public and private investments to restore the anadromous fish migration in the Susquehanna River.

Authorizing the proposed inflatable structure at Wilkes-Barre, even with an adequate fish passageway to support SRAFRFC goals, would reduce the likelihood of achieving those goals. Regardless of the type of fish passage facility, a substantial loss occurs in the number of anadromous fish that are able to pass each impounding structure (PAFBC, November 18, 2005). This contention is supported by existing data at the four existing hydroelectric dams that have provided passage for a given number of anadromous finfish, but actual counts passing are much less (see Table 2). Therefore, further structural

impediments will diminish the migration of shad and other anadromous finfish, and thwart the ultimate restoration goals of SRAFRC.

Year	Conowingo Dam	Holtwood Dam	Safe Harbor Dam	York Haven Dam
1997	90,971	28,063	20,828	-
1998	39,904	8,235	6,054	-
1999	69,712	34,702	34,150	-
2000	153,546	29,421	21,079	4,675
2001	193,574	109,176	89,816	16,200

Source: SRAFRC Management Plan, May 2002: *Alosid Management and Restoration Plan for Susquehanna River Basin*, pg. 19

Resident Fish:

Passage of resident fishes will be severely compromised by any proposed inflatable structure alternative. Resident fish species in this reach of the Susquehanna River include the smallmouth bass, walleye, northern pike, muskellunge, tiger muskellunge, channel catfish, and rock bass, the principal sport fishes in Pennsylvania. Other non-game resident fish species include shiners, minnows, and darters. Many of these resident fish species, including mussel host species are small, weak swimming fish (USFWS, May 16, 2007, pg. 3). The applicant has designed a Denil fish way run with 65-feet of baffles. Even for American shad, a strong swimming fish species, 65-feet is the maximum length recommended by USFWS for a shad fish passage design (USFWS, May 16, 2007, pg.3). Moreover, the applicant’s Denil design allows 3.3 feet of water (39.6 inches) at the exit channel during normal flows, which is 9.6 inches higher than what USFWS recommends (USFWS, May 16, 2007, pg.6). According to the USFWS May 16, 2007, letter, “ the velocity through this Denil design, combined with the lengthy Denil run, would make it difficult or impossible for smaller, weak-swimming fish to pass.”

In addition, when the inflatable structure is deflated, it will create a 12- to 18-inch elevation change (structure foundation plus bags). This ‘bump’ will create a weir effect as water moves through this height differential and will reduce resident fish migration when deflated. At the May 22, 2007, meeting with the applicant, the District requested an analysis to better quantify height differentials and what the passage condition over the substructure and foundation would be during the off-season when the inflatable structure is deflated. This information was not provided by the applicant.

In order to maintain a healthy resident fish population, resident species must be able to access a variety of specific habitat types at certain times of the year to meet temperature, spawning, foraging, or flow requirements. Numerous tagging studies have demonstrated that the continued ability of fish to migrate within their environment is essential to their survival. Smallmouth bass tagging studies by the PAFBC on the Juniata River have shown that smallmouth bass travel as far as 60-70 miles as part of their foraging and lifecycle requirements (PAFBC, November 18, 2005, pg. 3). Walleye tagging studies by the NY DEC have documented walleye moving up to 240 miles from their original tagging location (NY DEC, December 10, 2005, pg. 2). Additional studies by Ecology III, a local environmental consulting firm, have shown that walleye travel

considerable distances throughout the North Branch of the Susquehanna River (PAFBC, November 18, 2005, pg. 3).

Changes in water velocities from an impoundment will alter suitable substrate and will eliminate spawning sites and nursery areas for some resident species, further impacting populations. Changes in flow regime and pooling of river water associated with an impoundment will raise water temperature which may limit or fully displace some less tolerant resident fish populations. These stresses that are associated with interrupting a free-flowing river will result in the replacement of regional fauna by fishes adapted to a more regulated stream environment (Tyus, 1990).

Zebra mussels have recently been found in the upper portions of the North Branch of the Susquehanna and in reservoirs in its upper watershed. According to the USGS, zebra mussels have been found as far downstream as Binghamton, NY (USGS, 2005). Zebra mussels are highly prolific. A female zebra mussel can produce between 30,000 and 1 million eggs per year. The larvae emerge within 3-5 days and are free-swimming for up to a month. Zebra mussels are expected to spread downstream of Binghamton, NY, as far or farther than the proposed pool. If an inflatable structure is constructed, conditions would be more conducive for large populations of zebra mussels to become established during periods when the pool is impounded as compared to a free flowing river because zebra mussels prefer slower moving water with a preferred flow range is 0.15-0.5 meters/second (NHDES, 2007). Shorelines can become infested and impacted by sharp shells that wash in shallow areas or in areas that are exposed when the structure is deflated; decomposition of mussels can create noxious odors; boats can become infested; marker buoys can sink under the weight of mussel encrustation; docks can be destabilized or sunk by mussel colonization; and control can become costly (NHDES, 2007; National Atlas, 2007).

Eels:

As with anadromous fish, an inflatable structure will represent another barrier to American eels currently in the Susquehanna River and anticipated future populations of eels. The American eel is a catadromous fish (migrate downstream to spawn; with returning juveniles) and are native to the Susquehanna River. Prior to the construction of large dams on the Susquehanna River in the early 1900's, the annual harvest was about 100,000 eels, second only to shad in economic importance in Pennsylvania's portion of the Susquehanna River (Blankenship, 2005).

Eels are occasionally still collected above the dams on the Susquehanna River. Some of these are likely from historical stocking, but most of those eels should have reached adulthood and left to spawn (Mikkinen, 2008). Mikkinen (2008) also surmised that a few eels may occasionally get past the dams and/or crawled from other tributaries (such as the Delaware River) into Susquehanna River tributaries.

Measures to restore eel populations are in the early stages, but are being investigated. These measures have included surveys to collect baseline information on eel abundance, migration timing, catchability, and attraction parameters (Mikkinen, 2005); and the establishment of a workgroup for eels under the Susquehanna River Anadromous Fish Restoration Committee (Mikkinen, 2008). Mikkinen (2008) also stated that the major

downstream dams will be undergoing re-licensing during the next several years and that he is “confident that eel passage will be a part of these agreements.”

Eels typically cannot use fish ways that are constructed for shad because eels migrate toward slower moving water near the river’s edge, along the banks, and shad need higher than normal flows to pass. The attraction water system (AWS) of the proposed Denil fish way is designed for high flows to attract shad to enter the proposed fish way, and being located along the bank, is not expected to be effective in passing juvenile eels upriver. Main stem Susquehanna fish passage facilities (lifts and ladder) were designed and sized to pass adult shad and herring and are not effective (due to attraction flow velocities and operating schedules) in passing juvenile eels upriver (Mikkinen, 2005). The applicant has offered to place an eel way on the opposite bank of the proposed Denil fish way, but no specific plans were received. At a May 22, 2007, meeting with the applicant, the Corps requested documentation that the conceptual eel way has addressed the eel’s specific low-flow needs. To date, this has not been provided by the applicant. With evidence that some eels are currently in the Susquehanna River, albeit at much lower numbers than below the Conowingo Dam, and that future restoration efforts for eel passage are in the planning stages, it is appropriate to consider eel specific needs when considering any impoundment structure. The inflatable structure and proposed eel way represents another barrier to the eels currently in the Susquehanna River and anticipated future populations of eel.

Native mussels:

With an inflatable structure alternative, the native mussel populations will also be negatively impacted (PAFBC, October 26, 2006, pg.3) as their upstream migration will be hindered. The eastern elliptio (*Elliptio complanata*) is the most abundant and widespread native freshwater mussel in the northeast. Its ability to inhabit both flowing and standing water in concert with its ability to withstand pollution and habitat disturbance have made it the most common species of mussel (CT DEP, 2007). Also, these mussels can live for over a century. However, upstream colonization of freshwater mussels can only occur when the proper fish host carries the mussel larva (known as a glochidia) upstream and remains in the area long enough for the larva to metamorphose into a free-living juvenile, detach and fall to the river bottom (anywhere from a few days to more than 160 days). For the same reasons discussed above, construction of another impediment to the movement of eel, and to a lesser degree finfish, will limit upstream colonization.

Lellis, et al. (2001), have found that glochidia attached in largest numbers to the American eel, and have indicated that the stark decline and lack of native mussels’ up-stream of impediments in the Susquehanna River is directly linked to the decline of the eel that resulted after construction of those blockages. A study by the USGS found large populations of native mussels, *Elliptio complanata*, in a 125 mile stretch of the Delaware River, where there are no dams (Blankenship, July/August 2006). However, when the USGS surveyed native populations in the Susquehanna River near their laboratory in Wellsboro, Pennsylvania, above a series of dams, the results indicated that mussels that were common in the Delaware River were much scarcer in the Susquehanna River. Where they found the eastern elliptio, older mussels were present in low numbers and juveniles were rare (Blankenship, July/August 2006). The presence of mostly older

eastern elliptio, albeit in low numbers, and the scarcity of younger mussels, infers that there were once large populations of eastern elliptio in the Susquehanna River (Blankenship, July/August 2006). The decline may relate in part to the presence of main stem damming which restricts the movement of larval host species (Lellis, December 11, 2007).

This decline in native mussels also represents a loss of their water-filtering capability which may be affecting water quality in the Susquehanna River and the Chesapeake Bay. The implications to the affected aquatic ecosystem could be considerable. More specifically, USGS studies found that the Delaware River contains about 2 million mussel per mile, and those mussels can filter 0.5-1 gallon of water per hour. That extrapolates to the potential of filtering between 2-billion and 4-billion gallons per day or 6 times the average daily summer flow (Blankenship, July/August 2006). William Lellis, with the USGS, emphasized in their December 11, 2007, electronic mail, that while the research is preliminary and requires additional refinement, testing, and independent validation, the findings thus far indicate that we have lost a significant amount of biological filtration in the Susquehanna River due to loss of the freshwater mussel (*Elliptio complanata*), which in part may be explained by the occlusion of a primary host, the American eel due to main stem damming.

The applicant has offered eel passage, and, in a May 22, 2007, meeting between the Corps and the applicant, we requested information pertaining to how it will be designed for eel specific needs, but the applicant has not provided the requested information. The Corps believes, given the aforementioned preliminary findings and impending improvements at existing dams for eel passage, that an inflatable structure will be counter productive to eel restoration, would restrict movement of resident fish, and, thus, impact native mussels. The implications will be that the mussels associated filtering capacity and, hence, improved water quality conditions will continue to be compromised.

Benthics:

With the proposed project, sediment loading will have negative adverse impacts upon benthic invertebrates that form the basis of a riverine ecosystem.

“Dams capture all but the finest sediments moving down a river...” and “in the absence of high flushing flows, species with life stages that are sensitive to sedimentation, such as eggs and larvae of many invertebrates and fish, can suffer high mortality rates” (Poff, et. al 1997). It is the intent of the applicant to create a permanent recreational pool from Memorial Day through Labor Day. As a result, high flushing flows during this time frame will come only after significant rain events and when there is a need to deflate the bags.

The Corps disagrees with the applicants’ assertion that the current design of the proposed project (i.e., a flow-through system) will mitigate existing sedimentation problems and hence, will not affect the benthic aquatic life and fish spawning areas. All impoundments trap sediment. As water currents slow upstream of an impoundment, sediments drop to the bottom and cover the substrate. This will affect benthic aquatic life by smothering of external gills (Poff, et. al 1997). It will also decrease the diversity of available substrate for benthic invertebrates by converting riffle and pool complexes into a monotypic habitat of fine substrates. The applicant has not

demonstrated that operational flexibility will provide adequate flushing so that an impoundment will not impact benthic organisms due to sedimentation.

Migratory birds:

The proposed structure will have some minor negative impacts to migratory birds. The Peregrine Falcon (*Falco peregrinus*), a migratory bird, is the only migratory species nesting within the study area that is listed as endangered within the Commonwealth of Pennsylvania (Gannett Fleming, Inc., May 2005- Enclosure D, pg. 5). The proposed action will have negative impacts to this species, as well as other migratory birds in the study area, due to increased human traffic.

2.) Shoreline Erosion and Riparian Habitat – The applicant’s preferred alternative will adversely affect existing shoreline banks and accretion patterns during the lifetime of the impoundment facilities. Raising an inflatable structure will inundate the riparian shoreline. As discussed in the Public Interest Review Factor 9, an impounding structure, which will be inflated during the growing season, will likely impact riparian vegetation. Some erosion of the river bank can occur as a result of wave action from winds blowing across the recreational pool and/or boat wakes when the river’s water level is maintained at its normal recreational pool level during the recreational season. More erosion can occur as the banks slough or cave into the river during drawdown of the recreational pool when the water escapes from the weakened banks. The cycle of inflation and deflation of the bags that will occur from year to year will result in cumulative sloughing and erosion of the banks.

Although the applicant has stated that there will be a no wake zone at Wilkes-Barre, they have not provided any hydrologic and hydraulic (H&H) or geotechnical analysis documenting that there will not be erosion during deflation of the bags when the water leaves the saturated banks or from wind driven waves that will attack the banks when the structure is inflated. The existing unprotected riverbank slopes would need to be monitored for erosion and if found to occur, mitigation measures would need to be taken to prevent erosion. Of particular concern is the reach between Station 88+00 and Station 97+00 and the reach from the Pierce Street Bridge to just downstream of Union Street Pump Station, where the proposed pool will inundate the riverside floodplain up to the toe of the existing riverbank/levee slope. The applicant’s drawings show that the lower portion or toe of the riverside slope in these areas is protected with rip rap. However, there is no visual evidence of rip rap along these areas. Further investigation of these areas would need to be performed to verify the condition of the riverside slope and potential for erosion (USACE, January 24, 2008).

An inflatable structure is a physical barrier which, by itself, will adversely impact sediment transport and therefore erosion and accretion. “For a stream to be stable it must be able to consistently transport its sediment load, both in size and type, associated with local deposition and scour” (Rosgen, 1996). The construction of the physical barrier interrupts a fluvial river system and attempts to make a regulated habitat. Because the inflatable structure will influence the movement of water and sediment during the recreational pool season, the ability of the river to transport sediment and the amount of sediment for transport will be altered during this time. Instead of being consistently transported, the sediment trapped at the structure, when the bags are inflated, will be released in slugs during times when the bags are deflated. During the recreational season, if the transport capacity exceeds the available supply, a sediment deficit

exists and the channel can be expected to find its needed sediment from its bed and/or banks. Typical downstream responses can include channel bed degradation or incision, textural changes and lateral adjustment, including both expansion and contraction of channel width.

The applicant has not provided sufficient information to address the magnitude of this component of impact.

3.) Recreational Resources – The proposed project will have an adverse impact on recreation.

The Susquehanna River has been identified for boating, fishing, water contact sports (swimming) and aesthetics, by the Commonwealth. The applicant has stated in their feasibility study that “without meaningful water quality improvements, the present conditions in the Susquehanna River at Wilkes-Barre limit recreational use of the proposed impoundment to those activities that do not involve significant primary contact” (Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-24).

As indicated in the water quality section of the public interest review, fecal coliform concentrations that have been measured in the area render water quality that is extremely questionable for swimming with or without the applicant’s proposed alternative. The mere presence of more quiescent waters with a stable water level would attract people to the water for swimming. The applicant has proposed to monitor water quality and provide notice of water quality problems to the public, in order to partially mitigate these impacts (Gannett Fleming, Inc., July 2006, pg. 44-48; Gannett Fleming, Inc., March, 2007, pg. 29). However, even with the proposed mitigation measures, the applicant’s preferred alternative is more likely than not to increase adverse public health impacts as compared to the without project condition and as compared to any of the alternatives that do not involve an impoundment. This concern is reinforced by the USEPA which has stated that “the impoundment of poor quality river water may pose significant risks to human health from exposure to bacterial pathogens” (USEPA, December 8, 2005, pg. 2).

In addition to using operational flexibility to allow CSO flows to pass, the applicant proposes to address CSO impacts on the proposed recreational pool by implementing a detailed public notification and advisory program as a permit contingency (Gannett Fleming, Inc., March 2007, pg. 29). To date, no details have been provided by the applicant on their proposed notification and advisory program.

The PAFBC is the responsible regulatory agency for boating activities and no information has been provided to support the applicant’s assertion that the impoundment will result in increased boating. There will be trade offs in the type of recreational boating because pass through boating will be diminished. However, because the PAFBC did not comment on boat usage, the Corps cannot reach conclusions regarding the type and draft of vessels that will be able to safely operate in the pooled area. Therefore, we do not know if the results of the trade off will be positive or negative.

4.) Economics – All structural alternatives may negatively impact the economic development potential to the local area. As indicated by Gannett Fleming, Inc, in their permit application submittal, appendix B: “without addressing the CSO problem, the

potential success of the desired water based recreational activities and real economic development will be impaired” (Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-24). To quantify and compare the socio-economic benefits that the inflatable structure alternative will have on the Wyoming Valley Region, in relation to other non-structural alternatives, the Baltimore District engaged the Corps of Engineers, North Atlantic Division, regional economic expert to verify the economic benefits anticipated from each alternative in accordance with acceptable economic practice (USACE, August 2007).

RED benefits are benefits to a local community or regional economy, such as increases in employment, sales, incomes, or tax revenues. Table 3, summarizes the Corps estimated RED benefits, derived from the applicant’s economic analysis, for three alternatives: Riverfront Development Plan, Inflatable Structure, and Riverfront Development Plan + Inflatable Structure. The Corps did not calculate the RED benefits for the West Bank Riverfront Development Plan due to lack of available data. The Corps requested the RED benefits for the West Bank Riverfront Development Plan from the applicant (USACE, September 11, 2007, pg.1); however, this information has not been provided.

Table 3. Economics Review of the WBIS Permit Application August 2007				
Wyoming Valley Inflatable Structure Alternatives	Expected Visitation Numbers	RED Benefits County Tax Revenue	RED Benefits County Sales (direct)	RED Average Annual Benefits
Riverfront Development Plan	330,275	\$2.8 million (\$3.4 million X .826)	\$11.98 million (\$14.5 million X .826)	\$14.78 million
Inflatable Structure	69,725	\$591,600 (\$3.4 million X .174)	\$2.52 million (\$14.5 million X .174)	\$3.11 million
Riverfront Development Plan + Inflatable Structure	400,000	\$3.4 million	\$14.5 million	\$17.89 million
Riverfront Development Plan + Inflatable Structure + West Bank Riverfront Development Plan	Expected visitation numbers and RED benefits for this alternative are not available because data for the West Bank Riverfront Development was unavailable. Benefits would be at least (\$17.89 M) the amount shown for the Riverfront Development Plan + Inflatable Structure.			
Source: USACE, August 2007: NAE (New England District) <i>Economics Review of Wilkes-Barre Inflatable Structure Permit Application.</i>				

The Corps has estimated RED benefits to the region from the Riverfront Development Plan alternative to be approximately \$14.78 million annually, whereas RED benefits to the region from the inflatable structure alternative are estimated to be \$3.11 million annually.

If water quality issues occur within the impoundment, there will be a corresponding decrease in recreational usage and the expected RED of the applicant's preferred alternative, may not accrue as expected. See paragraph 15, Water Quality, of the Public Interest Review for detailed discussions of water quality.

The proposed project may also negatively impact the existing economic benefit to the citizens of New York from the existing walleye fishery. The existing Susquehanna River's recreational walleye fishery is one of the best in New York State and supports a modest but important segment of the local economy within the Binghamton Metropolitan Area. An inflatable structure at Wilkes-Barre will impede normal migration patterns of walleye and impact the quality of the fishery in New York State (NY DEC, December 10, 2005, pg. 2).

Loss of future expected fishing revenue within the Susquehanna River basin will also occur as a result of the proposed project, because it will not provide adequate anadromous fish passage. With the SRAFRC goals in place, the PAFBC estimates that future recreational shad fishing on the Susquehanna River Basin will result in some \$30 million annually in economic benefits (Susquehanna River Basin Commission, June 27, 2005, pg.1). This would be about ten times the estimated annual RED benefits that may accrue with an inflatable structure.

5.) Riffle and Pool Complexes - The natural flow of the Susquehanna River and the number and length of its riffle-pool complexes varies on time scales of hours, days, seasons, and years. "Many years of observation from a stream flow gauge are generally needed to describe the characteristic pattern of a river's flow quantity, timing and variability that is, its natural flow regime" (Poff et. al., 1997). The number and length of the riffle and pool complexes exist as a result of the structural 'contours' of the free-flowing Susquehanna River in this area both upstream and downstream of the proposed structure location. The flow variability of the river bottom contours, as seen in the 'low flow condition' in Figure 3 (Section X), provides insight into the diversity of these complexes that exist within the proposed 4.5 mile pool and in the areas downstream. Highly variable bottom contours are abundant and characterize much of the river bottom, thus permitting the formation of these complexes.

A review of recent aerial photography (leaf on) indicates that an estimated 13.35 acres of riffle and pool complexes are present in the 4.5 mile reach that would constitute the pool area. In addition, approximately 16.1 acres of riffle and pool complexes have been identified within 5000 feet downstream of the proposed structure (Plewa, 2008).

Riffle and pool complexes are identified specifically in Section 404(b)(1) Guidelines as special aquatic sites (40 CFR 230.45). The values of special aquatic sites are afforded special recognition under the Guidelines. The Guidelines have described riffles and pool complexes as particularly valuable habitat for fish and wildlife. In the Guidelines, riffles are described as having high dissolved oxygen levels, rough flow, and a turbulent surface because of the rapid movement of water over a coarse substrate. Pools are characterized by slower stream velocity, a streaming flow, a smooth surface, and a finer substrate. These characteristics contribute extensively to the river's ability to support a healthy and

diverse aquatic ecosystem. The Guidelines require avoiding (if a practicable alternative(s) exists) and/or minimizing discharges that would create standing bodies of water in riffle pool complex sites (40 CFR 230.10(a)).

Impounding of the river as proposed, will destroy the function and value of these special aquatic sites, within the pool and to a lesser degree, those found immediately downstream. If the proposed structure were constructed, the steep longitudinal profile that sustains the presence of riffle and pool complexes that exists now will be flattened from Memorial Day to Labor Day every year, when the bags are inflated. This will diminish the power of the river during these months which, in turn, will lessen the river's capacity to transport sediment. The riffle and pool complexes within the foot print of the proposed reservoir will (in addition to being covered by a column of standing water) be buried beneath the bed load and sediment retained within the impoundment. When the structure is inflated, fine particles of sediment would settle and bury the larger particles that currently compose the natural riffles and fill the natural depressions that are defined as pools. As a result of this and the loss of the natural flow variability within these complexes, the proposed inflatable structure will result in a loss of these special aquatic sites during critical months for spawning and foraging activities, altering their characteristically high biodiversity.

Interruption of a free flowing river with an impoundment, will also adversely impact downstream transport of larger size sediment particles when the structure is inflated (i.e., boulder, cobble, and gravel). If the transport capacity exceeds the available supply, a sediment deficit is created, resulting in 'net scour' of the river bottom and banks downstream. This will disrupt the natural maintenance of the riffle and pool complexes found below the impounding structure from Memorial Day to Labor Day every year. This will occur through alteration of the natural stream flow dynamics, as when the impoundment is filled, it will 'temporarily store' bed load and then release it rapidly during flushing events when the bags are deflated. This will alter the normal, slow movement of bed load to downstream reaches, necessary to maintain the natural stream character. This alteration will occur when there is heightened biological activity for aquatic life in a warm water fishery. Typically, spawning and foraging activities are elevated and nursery areas are in high demand from Memorial Day weekend through Labor Day weekend. "In the absence of high flushing flows, species with life stages that are sensitive to sedimentation, such as the eggs and larvae of many invertebrates and fish, can suffer high mortality rates" (Poff, et. al 1997). While the distance of this impact cannot be predicted, as the proposed operational flexibility is weather and discharge/flow dependent, 2007 aerial photography showed that there exists approximately 16.1 acres of downstream riffle and pool complexes within 5000' of the proposed structure location (Plewa, 2008).

6.) Safety – Any structural alternative will, under certain circumstances, negatively impact safety. The proposed structure is a low-head structure or weir, akin to a low-head dam. Low-head dams have been recognized by the Commonwealth of Pennsylvania as the most dangerous kind of dam on a river or stream. Low-head dams are characterized by impounding water completely within the banks and passing flow directly over the entire structure within the banks, excluding abutment, to a natural stream channel. Low-head dams, because of their short drop, have the appearance of being safe and the current forces can be deceptive. As a result, waders, recreational boaters, anglers, and/or

swimmers are more likely to underestimate the force of the current and be pulled into the force of the evacuating water near the structure. Once over a low-head dam, under certain conditions, a person will be carried to the face of the dam. The force of the evacuating water will push a person down to the base of the dam. If able to resurface, the force of the backwash will carry the victim back towards the dam and down again, continuing the cycle. Any debris such as logs or rocks caught in the back wash can complicate matters for the victim. In short, “low-head dams” pose a substantial threat to all users, under certain circumstances.

The safety risk associated with the characteristics of a low head dam may be minimized to boaters because the proposed impoundment would be regulated by PAFBC. Additionally, a PADEP letter dated November 16, 2006, indicates that “Act 91 of 1998 requires that the permittee mark the areas above and below the dam and on the banks immediately adjacent to the dam with signs and buoys of a design and content determined by PAFBC.....”

There is significant concern associated with the safety risk posed to recreational bathers. Excessive levels of fecal coliforms, which have already been documented to exist at the proposed structure location, are an indicator that primary contact recreation in the area could make users sick. The applicant has proposed to have a public warning system. To date, details on such a warning system have not been provided.

Alternative 6. Riverfront Development Plan (RDP) + West Bank Riverfront Development Plan

1.) Description of Alternative:

This alternative combines the RDP (described above under alternative 2) with the West Bank Riverfront Development Plan (described above under alternative 5).

2.) Impacts:

No impacts to wetlands would occur with this alternative. It would permanently impact 0.91 acre of the Susquehanna River (0.77 acre for the Riverfront Development plan and 0.14 acre for the West Bank Riverfront Development Plan).

This alternative would have no adverse impacts to threatened and endangered species or known historic and cultural resources. In addition, since no obstruction to the natural free flowing condition of the Susquehanna River at Wilkes-Barre is associated with this alternative, there would be no adverse impacts to riffle and pool complexes, American shad, resident fishes, native mussel species, American eel, benthic invertebrates, existing recreational river uses, water quality, shore erosion and riparian habitat, or to the economy.

We have also evaluated whether this alternative has other overriding environmental impacts or concerns. The Corps has determined that this alternative would not result in other significant adverse impacts to uplands, floodplains, fish and wildlife, farmland, parks, threatened and endangered species, historic resources, and social/cultural resources. In addition to the permanent impacts to waters of the US as described above, implementation of this alternative would result in only temporary and minor impacts to parkland. Therefore, in the context of

Section 230.10(a), this alternative does not have other significant adverse environmental consequences.

Since the RED benefits for the West Bank Riverfront Development Plan component of this alternative were not calculated, the District concludes that the RED benefits will be greater than \$14.78 million (Riverfront Development Plan) for this alternative, substantially meeting the overall project purpose defined by the Corps. The Corps has determined that this alternative will provide approximately 83% of the RED benefits defined by the applicant's preferred alternative. This alternative will not have the immediate or long term costs associated with construction and maintenance of an inflatable structure and fish passage facility. Significant river-based recreational opportunities will occur with the Riverfront Development Plan and the West Bank Riverfront Development Plan.

The cost to implement this alternative is approximately \$35.5 million (2006 costs). This cost reflects the \$22 million for the RDP and \$13.5 million for the West Bank Riverfront Development Plan.

This alternative meets the overall project purpose as defined by the Corps.

IX. Evaluation of the 404 (b)(1) Guidelines:

The purpose of the guidelines is to insure maintenance and/or restore the chemical, physical and biological integrity of waters of the U.S. through the control of discharges of dredged or fill material. Fundamental to these guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with the known and/or probable impacts of other activities affecting the ecosystems of concern. This section will review overall compliance with applicable sections of the 404(b)(1) guidelines

1. Subpart B, part 230.10 (a) - Restrictions on discharge:

Under Subpart B, part 230.10 (a) of the Guidelines, " *no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.* Subpart B, part 230.10 (a) (2) of the Guidelines states *an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered*". Thus this analysis is necessary to determine which alternative is the least environmentally damaging practicable alternative that meets the project purpose and need.

Where the activity associated with a discharge is proposed for a special aquatic site (as defined in 40 CFR Part 230, Subpart E), and does not require access or proximity to or siting within these types of areas to fulfill its basic project purpose (i.e., the project is not "water dependent"),

practicable alternatives that avoid special aquatic sites are presumed to be available, unless clearly demonstrated otherwise (40 CFR 230.10(a)(3)).

Two alternatives identified - Alternative 2 (Riverfront Development Plan) and Alternative 6 (Riverfront Development Plan + West Bank Riverfront Development Plan) meet the overall project purpose by providing for substantial new river based recreational opportunities, as well as maintaining existing recreational uses. As noted in Public Interest Review Factor 2 of this document, the RED benefits of the applicant's preferred alternative (Alternative 5) (Riverfront Development Plan + West Bank RDP + Inflatable Structure with Denil fish way) is estimated at \$17.89 million on an average annual basis. The estimated RED benefits for the applicant's preferred alternative does not include benefits from the West Bank RDP. The Riverfront Development plan alone provides an estimated \$14.78 million in average annual benefits or 83% of the benefits provided by the applicant's preferred alternative (Riverfront Development Plan + West Bank RDP + Inflatable Structure with Denil fish way).

Additionally, the potential additional \$3.11 million of RED benefits that may accrue from the inflatable structure are uncertain given potential impacts associated with existing water quality issues within the pool. See Public Interest Review Factor #15 of this document for a discussion of the projected water quality impacts in the pool. The economic analysis of all alternatives is predicated on no water quality or other environmental concerns detracting from recreational usage of the site. While there are water quality concerns associated with the alternatives that do not involve an inflatable structure with an impounded pool, these impacts are judged less severe in nature as compared to alternatives with an impoundment. This is because the non-impoundment alternatives have far less potential to bring humans in direct contact with the water and water quality impacts of CSOs are less severe and shorter lived in a free-flowing river as compared to an impoundment due to the higher velocities and greater assimilative capacity of free-flowing waters.

The project purposes and need can be met with alternatives involving the Riverfront Development Plan (Alternative 2 or 6).

2. Subpart B, sec. 230.11 Factual Determinations – Cumulative Impacts:

This section of the guidelines states: *“Cumulative impacts are the changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material. Although the impact of a particular discharge may constitute a minor change, in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems.”*

As compared to its historical condition, changes in the Susquehanna River ecosystem (particularly with eels, resident fish, anadromous fish, and native mussels) can be attributed, in part, to the presence of several dams on the main stem. These dams include four (4) hydropower dams, an inflatable Fabri-Dam (Sunbury) and a low-head dam

(Harrisburg) on the lower Susquehanna River. As discussed in the Public Interest Review Factors, efforts have been made and future efforts are underway to mitigate impacts to the life cycle needs of the affected species. However, the complete restoration to historic migration patterns will never be realized. The addition of another dam will be counter productive to past and future fish and eel restoration efforts and it would augment the interference that the existing structures pose. Moreover, in recent years, local municipalities have considered and investigated inflatable dams elsewhere on the Susquehanna River. Specifically, in 2004, the Rotary Club of Corning conducted a feasibility study for an inflatable structure on the Chemung River, which is a major headwater tributary to the Susquehanna River; around the same time, the City of Elmira hired a consultant to explore the possibility of an inflatable dam on the Chemung River; and as recent as 2007 The Central Bradford Region Comprehensive Plan listed, as an objective, pursuing an inflatable dam for recreational purposes in the Susquehanna River at Towanda.

When considering the cumulative impact of a number of individual discharges of dredged or fill material, a detailed review in the Public Interest Review of this document finds that cumulative adverse impacts would occur to anadromous finfish, eels, resident fish, and native mussels which require free movement, either from the confluence to upstream reaches, or in the case of resident species, within long unobstructed stretches of riverine habitats to complete their lifecycle needs. Cumulative adverse impacts would also occur to riffle-pool complexes. These areas are special aquatic sites and as such not only provide localized habitat but are important in maintaining biodiversity and overall productivity (biomass capacity) within the river. We would also anticipate additional structures/impoundments in the Susquehanna River basin if the WBIS is authorized. In this regard, based on our knowledge of the Susquehanna River and its tributaries, these additional structures/impoundments (if constructed) would potentially contribute to, and result in, additional adverse impacts to riffle-pool complexes.

3. Subpart C, sec. 230.20 - Substrate:

The proposed discharge will alter substrate, bottom elevation or contours and will result in changes in water circulation, depth, current pattern, water fluctuation, sediment transport and habitat diversity. The most important factor that shapes what organisms will be present is the nature of the substrate. A structure, when inflated, will reduce the power of the river. With more quiescent water, fine particles of sediment will settle and bury larger particles that currently compose the natural riffles and fill the natural depression that are defined as pools. The riffle-pool complexes within the foot print of the proposed reservoir will (in addition to being covered by a column of standing water) be buried beneath the bed load and sediment retained within the impoundment. An alteration of the diverse substrate associated with a free-flowing river will alter the diversity of aquatic life that currently resides in the system. After the recreational pool season, the aforementioned altered conditions will be restored to a certain degree. However, the recreational pool season, from Memorial Day weekend through Labor Day weekend, will alter the character of the substrate during critical spawning and foraging periods, and when nursery areas are in high demand. In short, the alterations in substrate will occur at a point in time that will most affect the diversity and populations of existing

aquatic organisms that have adapted to diverse conditions associated with a free-flowing river. While all of these impacts can be considered to be 'secondary,' they will have a considerable impact on the aquatic ecosystem and must be considered.

4. Subpart C, sec. 230.21 - Suspended particulates/turbidity:

During construction, there would be a short-term increase of suspended particulates and turbidity in the Susquehanna River. This would be the result of clearing for Riverfront Development and West Bank Development features, staging areas and site preparation for the construction of the impoundment. To minimize impacts, Best Management Practices (BMPs) for erosion and sediment control would be implemented.

After construction, secondary impacts of the impoundment would result from trapping suspended particulates in the pool area where water circulation has been diminished. The impoundment will create a pool area from Memorial Day weekend through Labor Day weekend, trapping suspended particulates during critical spawning and foraging periods for aquatic species. The Corps disagrees with the applicants' assertion that the current design of the proposed project (i.e., a flow-through system) will mitigate existing sedimentation problems and hence, will not affect the benthic aquatic life and fish spawning areas. All impoundments trap sediment. As water currents slow upstream of an impoundment, sediments drop to the bottom and cover the substrate. The applicant has not demonstrated that operational flexibility will have the potential to provide adequate flushing so that an impoundment will not impact aquatic life.

Significant increases in suspended particulate levels create turbidity plumes which are highly visible and aesthetically displeasing. A review of aerial photography over several years (1991 - 2004) revealed the proposed pool area is very dynamic and large amounts of suspended particulates are carried through the system (Plewa, 2008). During this time frame, the size and configuration of numerous islands and point bars changed and back channels silted shut. In addition, these photos clearly showed numerous sediment plumes from various inputs. The effect the impoundment will have on retaining suspended particulates will vary and be dependent upon the 'relative increase' in suspended particulates, the duration of the higher levels within the pool (based upon river flow dynamics), the current patterns, water levels, fluctuations present when such discharges occur; and the volume, rate, and duration of the CSO or other discharges. While difficult to quantify, the Corps finds that these factors will degrade conditions within the summer impoundment, resulting in adverse impacts to biological productivity and diversity.

5. Sec. 230.22 - Water:

Water is the part of the aquatic ecosystem in which organic and inorganic constituents are dissolved and suspended. It constitutes part of the liquid phase and is contained by the substrate. Water forms part of a dynamic aquatic life-supporting system. Water clarity, nutrients and chemical content, physical and biological content, dissolved gas levels, pH, and temperature contribute to its life-sustaining capabilities.

During construction, the project will result in temporary increases in suspended sediment into the water column. The impacts will be minimized with BMPs for sediment and erosion control.

Once completed, a structure will, when inflated, diminish the power of the river. The more quiescent water will not have enough energy in the pool to carry the sediment that enters the area. Nutrients and other pollutants typically are carried into waterways attach to sediment particles. As a result, during the recreational pool season, an impoundment is more likely than not to impact water properties as compared any of the alternatives that do not involve an impoundment.

6. Subpart C, sec. 230.23 - Current patterns and water circulation:

Current patterns and water circulation are the physical movements of water in the aquatic ecosystem. Currents and circulation respond to natural forces as modified by basin shape and cover, physical and chemical characteristics of water strata and masses, and energy dissipating factors.

The proposed project will modify current patterns and water circulation by obstructing flow, and changing the direction or velocity of water flow and circulation, or otherwise changing the dimensions of the water body. As a result, adverse changes will occur in location, structure, and dynamics of aquatic communities, as well as with deposition rates including deposition of suspended particulates; the rate and extent of mixing of dissolved and suspended components of the water body. The most significant adverse impact of this will be modification to aquatic habitats and ecosystems within the pool and immediately downstream of the structure as discussed in Public Interest Review Factor #4 (General Environmental Concerns) of this document and in 230.20, 230.22, and 230.45 of this 404(b)(1) evaluation.

7. Subpart C, sec. 230.24 - Normal water fluctuations:

Normal water fluctuations in a River system consist of hourly, daily, monthly, seasonal, and flood fluctuations in water level. Biological and physical components of such a system are attuned to or characterized by these periodic water fluctuations.

Once completed, an inflatable structure will alter normal water-level fluctuation patterns and result in prolonged periods of inundation of areas within the pool and seasonally (Memorial Day to Labor Day) less fluctuation in water levels. Such water level modifications will alter erosion and sedimentation rates. Altered erosion and sediment transport will impact existing fisheries and benthic communities/populations and may encourage establishment of nuisance organisms, through habitat modification and reduced food supplies. Finally, within the pool itself, increases in river depth will destroy spawning, foraging and nursery areas for existing species that have adapted to the normal water fluctuations associated with a free-flowing river.

8. Subpart D sec. 230.31 - Fish, crustaceans, mollusks, and other aquatic organisms in the food web:

Aquatic organisms in the food web include, but are not limited to, finfish, crustaceans, insects and insect larvae, planktonic organisms, and the plants and animals on which they feed and depend upon for their needs. All forms and life stages of an organism throughout its geographic range are included in this category.

The proposed project will affect populations of fish, and other food web organisms through alterations to water circulation discussed in Subpart C, sec. 230.20-230.24 above, which will cause changes in sedimentation/ bottom composition and thus suitability for benthic organisms which form the basis of the aquatic food chain. This will affect species diversity and leave open niches for the establishment or proliferation of an undesirable competitive species at the expense of the desired resident species. Suspended particulates settling on attached or buried eggs will smother the eggs of desirable species attempting to spawn by limiting or sealing off their exposure to oxygenated water. Typically, these eggs are nested in clear faster moving, well oxygenated water. These modifications to substrate will result in loss of habitat diversity, the debilitation or death of sedentary organisms by smothering and/or exposure to high levels of suspended particulates and a reduction in food supply.

The proposed project will also disrupt fish species movement of both resident and migratory species. Specifically, when inflated, a structure with Denil fish way will reduce the number of anadromous fish that will actually pass and completely block the migration of resident fish when inflated because these weaker swimming fish do not have the ability to swim against the resulting current of the fish way. When deflated, the 12- to 18-inch bump created by the structure foundations will impede both resident and anadromous fish from passing, thereby reducing the numbers that pass. This will redirect, delay, or stop the reproductive and feeding movements of some species of fish. This issue is discussed in detail in Public Interest Review Factor #7 of this document.

9. Subpart E, section 230.41 – Special Aquatic Sites – Wetlands:

Wetlands consist of areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The values and functions of wetlands are widely known. However, they are complex ecosystems both structurally and functionally and the complete replication of the functions and values of destroyed wetlands has proven difficult. For these reasons wetlands are identified as a special aquatic site in the 404(b)(1) guidelines and afforded special protection.

The non-structural alternatives would not impact jurisdictional wetlands. In contrast, all structural alternatives considered would directly impact 1.03 acres of forested wetlands and potentially indirectly impact another 13 acres of PFO and PEM wetlands that currently exist, within the banks of the proposed pool area, near or below the proposed

pool elevation. These 13 acres of wetlands could be indirectly impacted through increased and continuous inundation and/or saturation of their root zone during the recreational season. The extent of the indirect impacts depends on the elevation of the existing wetlands relative to the proposed 517 pool elevation and the ability of the existing vegetation to withstand months of continuous saturation or inundation during the growing season. The direct loss of 1.03 acres of PFO will adversely affect water quality benefits and biological productivity associated with this area. Continuous inundation and/or saturation of the root zone of another 13 acres of wetlands may affect existing vegetation, reduce the systems productivity, interfere with the filtration functions, change the existing habitat value and modify the capacity of the area store flood and desynchronize flood waters.

The impacts to these special aquatic sites are discussed in greater detail in Public Interest Review Factor #5 of this document.

10. Subpart E, sec. 230.45 – Special Aquatic Sites – Riffle and Pool Complexes:

Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. “Pools are characterized by a slower stream velocity, a steaming flow, a smooth surface, and a finer substrate. Riffle and pool complexes are particularly valuable habitat for fish and wildlife” (40 CFR 230.45).

Proposed alternative that involve construction of an inflatable structure will eliminate riffle and pool areas by displacement, hydrologic modification, and subsequent sedimentation. This will reduce stream habitat diversity, retard repopulation of aquatic organisms within the pool through sedimentation and the creation of unsuitable habitat. Fine sediments will be deposited between coarse particles, when the bags area inflated, and will clog riffle and pool areas, destroy habitats, and will cause mortality in many invertebrates and fish that are in life stages sensitive to sedimentation, such as during the egg and larvae stage. The impacts to these special aquatic sites are discussed in greater detail in Public Interest Review Factor # 4 of this document.

Alternatives 2 and 6 do not have impacts on riffle and pool complexes.

11. 404(b)(1) Conclusions:

Based upon a thorough and careful review of all the available information, and in accordance with Sec. 230.12(a) (3) of these Guidelines, the proposed project fails to comply with the requirements of these Guidelines and there are practicable alternatives to the proposed discharge that would have less adverse effect on the aquatic ecosystem. The applicant’s preferred alternative does not constitute the least environmentally damaging practicable alternative (LEDPA).

X. Public Interest Review (33CFR320.4): All public interest factors have been reviewed. The following public interest factors are considered relevant to this proposal. Both cumulative and secondary impacts on the public interest were considered.

1. Conservation - The applicant's preferred alternative will have a negative impact on conservation of the existing free flowing river condition at Wilkes-Barre. The section of the Susquehanna River in the vicinity of Wilkes-Barre, PA, currently stands as the longest stretch of the River with unimpeded flow; a length of 192 miles, from Binghamton, New York, to Sunbury, PA. Construction of the applicant's preferred alternative will convert the Susquehanna River from a free-flowing river to a relatively quiescent pool of impounded water when the structure is inflated from approximately Memorial Day through Labor Day every year. This would directly and indirectly negatively affect special aquatic sites including wetlands and riffle and pool complexes. In addition, it would negatively affect fish migration and alter the composition and quality of existing fisheries. Riparian areas, bank erosion and water quality will be negatively affected. Wetlands, riffle and pool complexes, fish migration, fisheries, riparian areas, bank erosion and water quality are discussed in detail elsewhere in this Public Interest Review.

During months of the year when the structure is deflated, there would be no pool; however, there would be an obstruction all the way across the river with a height of 12 to 18 inches above the existing river bottom. This will negatively affect fish migration which is discussed in detail elsewhere in this Public Interest Review.

2. Economics - To quantify and compare the socio-economic benefits that the inflatable structure alternative will have on the Wyoming Valley Region, in relation to other non-structural alternatives, the Baltimore District engaged the Corps of Engineers, North Atlantic Division, regional economic expert to verify the economic benefits anticipated from each alternative in accordance with acceptable economic practice (USACE, August 2007).

RED benefits are benefits to a local community or regional economy, such as increases in employment, sales, incomes, or tax revenues. Table 4, summarizes the Corps estimated RED benefits, derived from the applicant's economic analysis, for three alternatives: Riverfront Development Plan, Inflatable Structure, and Riverfront Development Plan + Inflatable Structure. The Corps did not calculate the RED benefits for the West Bank Riverfront Development Plan due to lack of available data. The Corps requested the RED benefits for the West Bank Riverfront Development Plan from the applicant (USACE, September 11, 2007, pg.1); however, this information has not been provided.

The Corps has estimated RED benefits to the region from the Riverfront Development Plan alternative to be approximately \$14.78 million annually, whereas RED benefits to the region from the inflatable structure alternative are estimated to be \$3.11 million annually.

If adverse water quality issues occur within the impoundment, as are anticipated, there will be a corresponding decrease in recreational usage and the expected regional

economic benefits of the applicant’s preferred alternative may not accrue as expected. See paragraph 15, Water Quality, for detailed discussions of water quality.

The proposed project may also negatively impact the existing economic benefit to the citizens of New York from the existing walleye fishery. The existing Susquehanna River’s recreational walleye fishery is one of the best in New York State and supports a modest but important segment of the local economy within the Binghamton Metropolitan Area. An inflatable structure at Wilkes-Barre will impede normal migration patterns of walleye and impact the quality of the fishery in New York State (NY DEC, December 10, 2005, pg.2).

Loss of future expected fishing revenue within the Susquehanna River basin will also occur as a result of the proposed project, because it will not provide adequate anadromous fish passage. With the SRAFRC goals in place, the PAFBC estimates that future recreational shad fishing in the Susquehanna River Basin will result in some \$30 million annually in economic benefits (Susquehanna River Basin Commission, June 27, 2005, pg.1). This would be about ten times the estimated annual RED benefits that may accrue with an inflatable structure.

Table 4. Economics Review of the WBIS Permit Application August 2007				
Wyoming Valley Inflatable Structure Alternatives	Expected Visitation Numbers	RED Benefits County Tax Revenue	RED Benefits County Sales (direct)	RED Average Annual Benefits
Riverfront Development Plan	330,275	\$2.8 million (\$3.4 million X .826)	\$11.98 million (\$14.5 million X .826)	\$14.78 million
Inflatable Structure	69, 725	\$591,600 (\$3.4 million X .174)	\$2.52 million (\$14.5 million X .174)	\$3.11 million
Riverfront Development Plan + Inflatable Structure	400,000	\$3.4 million	\$14.5 million	\$17.89 million
Riverfront Development Plan + Inflatable Structure + West Bank Riverfront Development Plan	Expected visitation numbers and RED benefits for this alternative are not available because data for the West Bank Riverfront Development was unavailable. Benefits would be at least the amount (\$17.89 M) shown for the Riverfront Development Plan + Inflatable Structure.			
Source: USACE, August 2007: NAE (New England District) <i>Economics Review of Wilkes-Barre Inflatable Structure Permit Application.</i>				

3. Aesthetics – Visual aesthetics are subjective as the physical appearance of the pool behind the impoundment will be dependent upon one’s perspective of a free flowing

versus an impounded segment of the river. The proposed inflatable structure will have minor temporary impacts on aesthetics during construction.

Under certain circumstances, aesthetics can be degraded by water quality issues. Appendix B of the permit application states “CSO discharges will tend to diminish public interest in all recreational uses of the project by creating unpleasant odors, unsightly algae blooms, and deposits of suspended wastes within the pool”(Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-24).

4. General Environmental Concerns - The proposed project will have a negative adverse impact on the natural free flowing state of the Susquehanna River that currently exists at Wilkes-Barre. This alteration will directly and indirectly affect wetlands, riffle and pool complexes and the composition and quality of existing fisheries. In addition, riparian areas, fisheries, bank erosion, and water quality will be negatively affected.

The natural flow of the Susquehanna River and the number and length of its riffle-pool complexes varies on time scales of hours, days, seasons, and years. “Many years of observation from a stream flow gauge are generally needed to describe the characteristic pattern of a river’s flow quantity, timing and variability that is, its natural flow regime” (Poff et. al.,1997). The number and length of the riffle and pool complexes exist as a result of the structural ‘contours’ of the free-flowing Susquehanna River, in this area, both upstream and downstream of the proposed structure location. The flow variability of the river bottom contours, as seen in the ‘low flow condition’ in Figure 3, provide insight into the diversity of these complexes that exist within the proposed 4.5 mile pool and in the areas downstream. Highly variable bottom contours are abundant and characterize much of the river bottom, thus permitting the formation of these complexes.



(Figure 3. *Riffle pool complex in the Susquehanna River within the proposed pool area*)
(Source: Gannett Fleming, Inc., May 2005 – Appendix H)

A review of recent aerial photography (leaf on) indicates that an estimated 13.35 acres of riffle and pool complexes are present in the 4.5 mile reach that would constitute the pool area. In addition, approximately 16.1 acres of riffle and pool complexes have been identified within 5000 feet downstream of the proposed structure (Plewa, 2008).

Riffle and pool complexes are identified specifically in Section 404(b)(1) Guidelines as special aquatic sites (40 CFR 230.45). The values of special aquatic sites are afforded special recognition under the Guidelines. The Guidelines have described riffles and pool complexes as particularly valuable habitat for fish and wildlife. In the Guidelines, riffles are described as having high dissolved oxygen levels, rough flow, and a turbulent surface because of the rapid movement of water over a coarse substrate. Pools are characterized by slower stream velocity, a streaming flow, a smooth surface, and a finer substrate. These characteristics contribute extensively to the river's ability to support a healthy and diverse aquatic ecosystem. The Guidelines require avoiding (if a practicable alternative(s) exists) and/or minimizing discharges that would create standing bodies of water in riffle pool complex sites (40 CFR 230.10(a)).

Impounding of the river as proposed, will destroy the function and value of these special aquatic sites, within the pool and to a lesser degree, those found immediately downstream. If the proposed structure were constructed, the longitudinal profile that sustains the presence of riffle and pool complexes that exists now will be flattened from Memorial Day to Labor Day every year, when the bags are inflated. This will diminish the power of the river during these months which, in turn, will lessen the river's capacity to transport sediment. The riffle and pool complexes within the foot print of the proposed impoundment will (in addition to being covered by a column of standing water) be buried beneath the bed load and sediment retained within the impoundment. When the structure is inflated, fine particles of sediment would settle and bury the larger particles that currently compose the natural riffles and fill the natural depressions that are defined as pools. As a result of this and the loss of the natural flow variability within these complexes, the proposed inflatable structure will result in a loss of these special aquatic sites during critical months for spawning and foraging activities, altering their characteristically high biodiversity.

Interruption of a free flowing river with an impoundment, will also adversely impact downstream transport of larger size sediment particles when the structure is inflated (i.e., boulder, cobble, and gravel). If the transport capacity exceeds the available supply, a sediment deficit is created, resulting in 'net scour' of the river bottom and banks downstream. This will disrupt the natural maintenance of the riffle and pool complexes found below the impounding structure from Memorial Day to Labor Day every year. This will occur through alteration of the natural stream flow dynamics, as when the impoundment is filled, it will 'temporarily store' bed load and then release it rapidly during flushing events when the bags are deflated. This will alter the normal, slow movement of bed load to downstream reaches, necessary to maintain the natural stream character. This alteration will occur when there is heightened biological activity for aquatic life in a warm water fishery. Typically, spawning and foraging activities are elevated and nursery areas are in high demand from Memorial Day weekend through Labor Day weekend. "In the absence of high flushing flows, species with life stages that are sensitive to sedimentation, such as the eggs and larvae of many invertebrates and fish, can suffer high mortality rates" (Poff, et. al 1997). While the distance of this impact cannot be predicted, as the proposed operational flexibility is weather and discharge/flow dependent, recent aerial photography showed that there exists approximately 16.1 acres of downstream riffle and pool complexes within 5000' of the proposed structure location (Plewa, 2008).

5. Wetlands – The applicant’s preferred alternative will have an adverse impact on wetlands. The project, as proposed, will directly impact 1.95 acres of palustrine forested (PFO) wetlands. Of the 1.95 acres, 1.03 acres will be permanent and 0.92 acre will be temporary. In addition, up to an additional 13.0 acres of PFO and PEM wetlands which currently exist within the banks of the proposed pool area, near or below the proposed pool elevation, may be impacted. Specifically, these 13 acres of wetlands could be indirectly impacted through increased and continuous inundation and/or saturation of their root zone during the recreational season. The extent of the indirect impacts depends on the elevation of the existing wetlands relative to the proposed 517 pool elevation and the ability of the existing vegetation to withstand months of continuous saturation or inundation during the growing season.

With the proposed project, the functions of the permanently impacted wetlands will be eliminated. In addition to other wetland functions, wetlands serve to immobilize heavy metals and other pollutants that enter their system, thereby reducing the metal and pollution inputs to downstream areas. Of particular concern in the study area are heavy metals, which are prevalent due to acid mine drainage up slope. Winger (1986) discussed research on the removal of pesticide and metal contaminants by forested wetlands. He noted work that showed that 70% of the pesticides and 94% of sediment (and most pollutants attach and travel on sediment) in runoff were removed during overflow through forested wetlands. “Most contaminants that are potentially toxic to indigenous biological resources tend to bind to particles” (SCCWRP, 1999).

Wetlands also serve to retain and uptake nutrients. Wetlands, in their natural state, have low export rates of nutrients. They also have a diffuse overland flow patterns which serve to uptake nutrients, affect temperature and light, and reduce sedimentation and pollutants from upslope areas. Every pollutant that enters a wetland may be altered by uptake, cycling and dilution (Kadlec & Kadlec, 1978). All wetlands, at times, have anaerobic conditions. These conditions reduce nitrite to nitrogen gas. Carter’s (1985) literature review points out that nitrogen and phosphorus are significantly reduced in water flowing through wetlands, thereby reducing the amount of nutrients delivered downstream.

Overall, the direct impacts to wetlands will be 1.95 acres as a result of the inflatable structure, whereas no wetland impacts are proposed with the Riverfront Development Plan. Additionally, without the inflatable structure, the potential secondary impacts to an additional 13.0 acres of PFO wetlands will be eliminated. The applicant has stated that, if an inflatable structure were allowed, they will monitor these wetlands for and provide mitigation if necessary. No specific monitoring plan has been submitted, nor have potential suitable mitigation sites been identified.

To mitigate for the 1.03 acres of permanent impacts to forested wetlands, the applicant has provided a mitigation plan, proposing to create 1.03 acres of forested wetlands located on-site, between the River and the flood levee adjacent to Kirby Park, which is replacement on a 1:1 basis. It has consistently been the Corps’ practice to replace the loss of forested wetlands on, at least, a 2:1 basis. Regulatory Guidance Letter 02-2 entitled “Compensatory Mitigation Projects for Aquatic Resource Impacts under The Corps Regulatory Program” emphasizes functional replacement of wetland losses rather than acreage replacement. It goes on to state that, “the ratio should be greater than one-to-one where the impacted functions are demonstrably high and the replacement wetlands are of lower function.” In this case the forested wetlands to be impacted

were evaluated by the applicant, and found to perform the following functions: sediment/shoreline stabilization, flood flow alteration, wildlife habitat, nutrient removal, and sediment/toxicant retention. Forested wetlands take many years to develop causing a temporal loss of wetland function. Forested wetlands also have a large biomass and exert substantial control over cycling and retention. Moreover, they are characterized as having different layers of vegetation and hence more available habitat. For all these reasons, the forested wetlands to be impacted are considered to have high functions and values. Therefore, the replacement ratio to mitigate forested wetland losses, including temporal loss of wetland functions, requires greater than 1:1 mitigation. The Corps informed the applicant, by letters dated February 3, 2006, and January 30, 2007, and as part of the May 22, 2007, meeting with the applicant, that a plan demonstrating forested wetland replacement on a 2:1 basis was required.

6. Historic and Cultural Resources - As currently proposed, the project will have an adverse effect on a resource eligible for the National Register of Historic Places. At a meeting on June 12, 2007, the Corps and the Pennsylvania Historical and Museum Commission (PHMC) informed the applicant that the proposed action as currently designed would have an adverse effect on the Wyoming Valley Motors Prehistoric Site. Specifically, the Baltimore District determined, and the PHMC agreed, that a Phase II investigation and appropriate mitigation measures such as Phase III data recovery excavations would likely be required if the project was not redesigned to avoid an adverse effect on this resource (PHMC, October 5, 2006, pg.1). To date, the applicant has not provided revised plans to avoid or mitigate the adverse effect to the National Register of Historic Places eligible site.

On October 3, 2007, the Onondaga Nation, a Federally recognized Indian tribe, requested information on the status of the phase II investigation and consultation with the Corps on this project (Onondaga Nation, October 3, 2007, pg. 2). We contacted the tribal historic preservation officer and informed them that we are awaiting a design change that would presumably avoid adverse effects to the archaeological resource. Once that design change has been received, we will contact the Onondaga Nation for consultation.

7. Fish and Wildlife Values – The proposed project will negatively impact the movement of existing populations of resident fish, native mussels, and benthic communities (within the pool), as well as the expected movement of American shad and river herring (anadromous finfish) and eel populations. The proposed project will have minimal negative impacts to migratory birds, including the Peregrine falcon.

Anadromous finfish:

Due to their economic importance and their historical use for human consumption, crab bait, fish meal and fish oil, there has been a significant cooperative effort that has been put forth to restore American shad populations, and to a lesser extent river herring, in the Susquehanna River. The cooperating parties include the USFWS, the National Marine Fisheries Service (NMFS), the Susquehanna River Basin Commission (SRBC), the PADEP, the PAFBC, the NY DEC, and the MD DNR, as well as utilities and citizens groups. This team of cooperating entities is referred to as the SRAFRC and it has committed over \$75 million over the last 40 years to rebuilding shad and river herring populations in the Susquehanna River. The restoration program goal is to reestablish an annual spawning population, in the Susquehanna River, of 2 million shad and 20

million herring by 2025, and to allow the migration of the American shad to its historical upstream limit (above Binghamton, New York) for the first time in 100 years.

Dams have blocked or impeded upstream migration of anadromous fish on main stem rivers. On the lower Susquehanna River, there are four hydropower dams and there is one “Fabri-Dam” in Sunbury approximately 65 river miles downstream of the proposed WBIS. The four hydropower dams are: Conowingo Dam, Holtwood Dam, Safe Harbor Dam, and York Haven (see Figure 2 Section VIII). There are 134 river miles between the uppermost hydropower dam at York Haven and the proposed Wilkes-Barre inflatable structure location.

All four hydropower dams currently have fish passage for both resident and anadromous finfish. Fish lifts (i.e., elevators) were constructed at Conowingo Dam in 1971 (west) and 1991 (east) at a cost of \$12 million, Holtwood Dam in 1997 at a cost of \$22 million and at Safe Harbor Dam in 1997 at a cost of \$16 million. A vertical slot fish way was constructed at York Haven Dam in 2000 at a cost of \$9 million. (PAFBC, November 18, 2005, pg.1). Total funds spent to date on construction of fish passage facilities at these structures is \$59 million.

All four (4) of these hydropower dams will be required to provide additional improvements as part of Federal Energy Regulatory Commission (FERC) relicensing. Relicensing agreements are currently underway at Holtwood Dam and re-licensing will occur by 2014 at the other three dam facilities. (PAFBC, May 9, 2007, pg.1).

Table 5 indicates the current capacity for the first and last dams on the Susquehanna to pass shad and the SRAFRC restoration goals for each of these dams.

Dam	Current Capacity	Capacity After Re-licensing
Conowingo Dam (1 st dam in series)	1.5 million shad	2.5 + million shad
York Haven Dam (last dam (4 th) in series)	500,000 shad	2.0 million shad
Source: USFWS, June 15, 2007		

The Adam T. Bower Memorial Dam, (“Fabri-Dam” in Sunbury) currently does not have fish passage but will be retrofitted for fish passage with a vertical slot fish way to pass a minimum of 600,000 shad. The Adam T. Bower Memorial Dam is owned and operated by the PA DCNR and is under State requirement to retro-fit this fish-passage (PAFBC, Executive Director, December 28, 2005, pg.2). Under Section 3501(a) of the PA Fish and Boat Code (30 Pa.C.S 3501(a)), a dam owner must erect “such chutes, slopes, fish ways, gates, or other devices as the Commission may deem necessary to enable the fish to ascend and descend the waters at all seasons of the year.” As such, there is already a completed fish way design (serpentine vertical slot) that will pass a minimum of 600,000 American shad (Gannett Fleming, Inc., May 2005 - Appendix D, pg. 4). A permit for such a facility (vertical slot fish way) was issued by the

Baltimore District in 2003. The state legislature committed \$5.3 million to the PA DCNR; however, this commitment fell short of the lowest construction bid by approximately \$2 million (PA House of Representatives, February 15, 2007, pg. 2). A specific timeframe for completion cannot be provided at this time. The PAFBC has indicated that the requirement to retrofit is not negotiable, although they recognize that the cause for this delay has precluded construction to date (PAFBC, October 15, 2007). It is expected that a vertical slot fish passage facility will be constructed as required by PAFBC requirements and in keeping with the mandate and goals of the SRAFRFC.

The applicant proposed a Denil fish passage facility as part of the proposed inflatable structure. This passage capability (up to 20,000 shad annually) is inconsistent with /will not meet the long-term goals of the SRAFRFC goals (NY DEC, May 11, 2007, pg.1). The applicant's proposed Denil fish passage capacity is thirty times less than the passage capacity (600,000) planned for construction at the Sunbury Fabri-Dam.

The applicant concluded that American shad concerns (migration and passage) should not be considered in the permit evaluation because they indicated that shad do not migrate when water temperatures rise above 70 degrees F downstream. Therefore, the applicant has proposed to inflate the structure when the water temperature exceeds 70 degrees F downstream (Gannett Fleming, Inc., January 2007, pg. 14-15). The three technical resource agencies (USFWS, PAFBC, and NYDEC) maintained that the temperature data do not support the applicant's conclusion. Specifically, 70 degrees F is not a limiting temperature for shad movement, and even the highest temperature recorded by the USGS during the migration period was still well within the range of temperatures where successful movement and spawning are known to occur (PAFBC, February 22, 2007, pg 2; USFWS, April 10, 2007, pg. 1-2; NY DEC, March 1, 2007, pg. 1-2). The Corps finds that authorizing the proposed inflatable structure at Wilkes-Barre on the main stem of the Susquehanna River without an adequate fish passageway to support SRAFRFC goals would negate the viability of past and reasonably foreseeable public and private investments to restore the anadromous fish migration in the Susquehanna River.

Authorizing the proposed inflatable structure at Wilkes-Barre, even with an adequate fish passageway to support SRAFRFC goals, would reduce the likelihood of achieving those goals. Regardless of the type of fish passage facility, a substantial loss occurs in the number of anadromous fish that are able to pass each impounding structure (PAFBC, November 18, 2005). This contention is supported by existing data at the four existing hydroelectric dams that have provided passage for a given number of anadromous finfish, but actual counts passing are much less (see Table 6). Therefore, further structural impediments will diminish the migration of shad and other anadromous finfish, and thwart the ultimate restoration goals of SRAFRFC.

Resident Fish:

Passage of resident fishes will be severely compromised by any proposed inflatable structure alternative. Resident fish species in this reach of the Susquehanna River include the smallmouth bass, walleye, northern pike, muskellunge, tiger muskellunge, channel catfish, and rock bass, the principal sport fishes in Pennsylvania. Other non-game resident fish species include shiners, minnows, and darters. Many of these resident fish species, including mussel host species are

small, weak swimming fish (USFWS, May 16, 2007, pg.3). The applicant has designed a Denil fish way run with 65-feet of baffles. Even for American shad, a strong swimming fish species, 65-feet is the maximum length recommended by USFWS for a shad fish passage design (USFWS, May 16, 2007, pg.3). Moreover, the applicant’s Denil design allows 3.3 feet of water (39.6 inches) at the exit channel during normal flows, which is 9.6 inches higher than what USFWS recommends (USFWS, May 16, 2007, pg. 6). According to the USFWS May 16, 2007, letter, “ the velocity through this Denil design, combined with the lengthy Denil run, would make it difficult or impossible for smaller, weak-swimming fish to pass.”

Year	Conowingo Dam	Holtwood Dam	Safe Harbor Dam	York Haven Dam
1997	90,971	28,063	20,828	-
1998	39,904	8,235	6,054	-
1999	69,712	34,702	34,150	-
2000	153,546	29,421	21,079	4,675
2001	193,574	109,176	89,816	16,200

Source: SRAFRC Management Plan, May 2002: *Alosid Management and Restoration Plan for Susquehanna River Basin*, pg. 19

In addition, when the inflatable structure is deflated, it will create a 12- to 18-inch elevation change (structure foundation plus bags). This ‘bump’ will create a weir effect as water moves through this height differential and will reduce resident fish migration when deflated. At the May 22, 2007, meeting with the applicant, the District requested an analysis to better quantify height differentials and what the passage condition over the substructure and foundation would be during the off-season when the inflatable structure is deflated. This information was not provided by the applicant.

In order to maintain a healthy resident fish population, resident species must be able to access a variety of specific habitat types at certain times of the year to meet temperature, spawning, foraging, or flow requirements. Numerous tagging studies have demonstrated that the continued ability of fish to migrate within their environment is essential to their survival. Smallmouth bass tagging studies by the PAFBC on the Juniata River have shown that smallmouth bass travel as far as 60-70 miles as part of their foraging and lifecycle requirements (PAFBC, November 18, 2005, pg. 3). Walleye tagging studies by the NY DEC have documented walleye moving up to 240 miles from their original tagging location (NY DEC, December 10, 2005, pg. 2). Additional studies by Ecology III, a local environmental consulting firm, have shown that walleye travel considerable distances throughout the North Branch of the Susquehanna River (PAFBC, November 18, 2005, pg. 3).

Changes in water velocities from an impoundment will alter suitable substrate and will eliminate spawning sites and nursery areas for some resident species, further impacting populations. Changes in flow regime and pooling of river water associated with an impoundment will raise water temperature which may limit or fully displace some less tolerant resident fish populations. These stresses that are associated with interrupting a free-flowing river will result in the replacement of regional fauna by fishes adapted to a more regulated stream environment (Tyus, 1990).

Zebra mussels have recently been found in the upper portions of the North Branch of the Susquehanna and in reservoirs in its upper watershed. According to the USGS, zebra mussels have been found as far downstream as Binghamton, NY (USGS, 2005). Zebra mussels are highly prolific. A female zebra mussel can produce between 30,000 and 1 million eggs per year. The larvae emerge within 3-5 days and are free-swimming for up to a month. Because zebra mussels are so prolific, it is reasonable to deduce that they will continue to migrate downstream of Binghamton, NY, as far or farther than the proposed pool. If an inflatable structure is constructed, conditions would be more conducive for large populations of zebra mussels to become established during periods when the pool is impounded as compared to a free flowing river because zebra mussels prefer slower moving water with a preferred flow range is 0.15-0.5 meters/second (NHDES, 2007). Shorelines can become infested and impacted by sharp shells that wash in shallow areas or in areas that are exposed when the structure is deflated; decomposition of mussels can create noxious odors; boats can become infested; marker buoys can sink under the weight of mussel encrustation; docks can be destabilized or sunk by mussel colonization; and control can become costly (NHDES, 2007; National Atlas, 2007).

Eels:

As with anadromous fish, an inflatable structure will represent another barrier to American eels currently in the Susquehanna and anticipated future populations of eels. The American eel is a catadromous fish (migrate downstream to spawn; with returning juveniles) and are native to the Susquehanna River. Prior to the construction of large dams on the Susquehanna in the early 1900's, the annual harvest was about 100,000 eels, second only to shad in economic importance in Pennsylvania's portion of the Susquehanna (Blankenship, 2005).

Eels are occasionally still collected above the dams on the Susquehanna River. Some of these are likely from historical stocking, but most of those eels should have reached adulthood and left to spawn (Mikkinen, 2008). Mikkinen (2008) also surmised that a few eels may occasionally get past the dams and/or crawled from other tributaries (such as the Delaware River) into Susquehanna tributaries.

Measures to restore eel populations are in the early stages, but are being investigated. These measures have included surveys to collect baseline information on eel abundance, migration timing, catchability, and attraction parameters (Mikkinen, 2005); and the establishment of a workgroup for eels under the Susquehanna River Anadromous Fish Restoration Committee (Mikkinen, 2008). Mikkinen (2008) also stated that the major downstream dams will be undergoing re-licensing during the next several years and that he is "confident that eel passage will be a part of these agreements."

Eels typically cannot use fish ways that are constructed for shad because eels migrate toward slower moving water near the river's edge, along the banks, and shad need higher than normal flows to pass. The attraction water system (AWS) of the proposed Denil fish way is designed for high flows to attract shad to enter the proposed fish way, and being located along the bank, is not expected to be effective in passing juvenile eels upriver. Main stem Susquehanna fish passage facilities (lifts and ladder) were designed

and sized to pass adult shad and herring and are not effective (due to attraction flow velocities and operating schedules) in passing juvenile eels upriver (Mikkinen, 2005). The applicant has offered to place an eel-way on the opposite bank of the proposed Denil fish way, but no specific plans were received. At a May 22, 2007, meeting with the applicant, the Corps requested documentation that the conceptual eel-way has addressed the eel's specific low-flow needs. To date, this has not been provided by the applicant. With evidence that some eels are currently in the Susquehanna River, albeit at much lower numbers than below the Conowingo dam, and that future restoration efforts for eel passage are in the planning stages, it is appropriate to consider eel specific needs when considering any impoundment structure. The inflatable structure and proposed eel-way represents another barrier to the eels currently in the Susquehanna River and anticipated future populations of eel.

Native mussels:

With an inflatable structure alternative, the native mussel populations will also be negatively impacted (PAFBC, October 26, 2006, pg.3) as their upstream migration will be hindered. The eastern elliptio (*Elliptio complanata*) is the most abundant and widespread native freshwater mussel in the northeast. Its ability to inhabit both flowing and standing water in concert with its ability to withstand pollution and habitat disturbance have made it the most common species of mussel (CT DEP, 2007). Also, these mussels can live for over a century. However, upstream colonization of freshwater mussels can only occur when the proper fish host carries the mussel larva (known as a glochidia) upstream and remains in the area long enough for the larva to metamorphose into a free-living juvenile, detach and fall to the river bottom (anywhere from a few days to more than 160 days). For the same reasons discussed above, construction of another impediment to the movement of eel, and to a lesser degree finfish, will limit upstream colonization.

Lellis, et al. (2001) have found that glochidia attached in largest numbers to the American eel, and have indicated that the stark decline and lack of native mussels up-stream of impediments in the Susquehanna River is directly linked to the decline of the eel that resulted after construction of those blockages. A study by the USGS found large populations of native mussels, *Elliptio complanata*, in a 125 mile stretch of the Delaware River, where there are no dams (Blankenship, July/August 2006). However, when the USGS surveyed native populations in the Susquehanna River near their laboratory in Wellsboro, Pennsylvania, above a series of dams, the results indicated that mussels that were common in the Delaware River were much scarcer in the Susquehanna River. Where they found the eastern elliptio, older mussels were present in low numbers and juveniles were rare (Blankenship, July/August 2006). The presence of mostly older eastern elliptio, albeit in low numbers, and the scarcity of younger mussels, infers that there were once large populations of eastern elliptio in the Susquehanna River (Blankenship, July/August 2006). The decline may relate in part to the presence of mainstem damming which restricts the movement of larval host species (Lellis, December 11, 2007).

This decline in native mussels also represents a loss of their water-filtering capability which may be affecting water quality in the Susquehanna River and the Chesapeake Bay. The implications to the affected aquatic ecosystem could be considerable. More specifically, USGS studies found that the Delaware River contains about 2 million mussel per mile, and those mussels can filter

0.5-1 gallon of water per hour. That extrapolates to the potential of filtering between 2-billion and 4-billion gallons per day or 6 times the average daily summer flow (Blankenship, July/August 2006). William Lellis, with the USGS, emphasized in their December 11, 2007, electronic mail, that while the research is preliminary and requires additional refinement, testing, and independent validation, the findings thus far indicate that we have lost a significant amount of biological filtration in the Susquehanna River due to loss of the freshwater mussel (*Elliptio complanata*), which in part may be explained by the occlusion of a primary host, the American eel due to mainstem damming.

The applicant has offered eel passage, and, in a May 22, 2007, meeting between the Corps and the applicant, we requested information pertaining to how it will be designed for eel specific needs, but the applicant has not provided the requested information. The Corps believes, given the aforementioned preliminary findings and impending improvements at existing dams for eel passage, that an inflatable structure will be counter productive to eel restoration, would restrict movement of resident fish, and, thus, impact native mussels. The implications will be that the mussels associated filtering capacity and, hence, improved water quality conditions will continue to be compromised.

Benthics:

With the proposed project, sediment loading will have negative adverse impacts upon benthic invertebrates that form the basis of a riverine ecosystem.

“Dams capture all but the finest sediments moving down a river...” and “in the absence of high flushing flows, species with life stages that are sensitive to sedimentation, such as eggs and larvae of many invertebrates and fish, can suffer high mortality rates” (Poff, et. Al., 1997). It is the intent of the applicant to create a permanent recreational pool from Memorial Day through Labor Day. As a result, high flushing flows during this time frame will come only after significant rain events and when there is a need to deflate the bags.

The Corps disagrees with the applicants’ assertion that the current design of the proposed project (i.e., a flow-through system) will mitigate existing sedimentation problems and hence, will not affect the benthic aquatic life and fish spawning areas. All impoundments trap sediment. As water currents slow upstream of an impoundment, sediments drop to the bottom and cover the substrate. This will affect benthic aquatic life by smothering of external gills (Poff, et. al 1997). It will also decrease the diversity of available substrate for benthic invertebrates by converting riffle and pool complexes into a monotypic habitat of fine substrates. The applicant has not demonstrated that operational flexibility will provide adequate flushing so that an impoundment will not impact benthic organisms due to sedimentation.

Migratory birds:

The proposed structure will have some minor negative impacts to migratory birds. The Peregrine Falcon (*Falco peregrinus*), a migratory bird, is the only migratory species nesting within the project area that is state-listed as endangered within the Commonwealth of Pennsylvania (Gannett Fleming, Inc., May 2005- Enclosure D, pg. 5). The proposed action will have minor negative impacts to this species, as well as other migratory birds in the study area, due to increased human traffic.

8. Flood Hazards – The proposed project will pose no additional flooding hazards. The applicant's Emergency Action Plan submitted with their May 2005 permit application stated that an uncontrolled release of the reservoir pool will be entirely contained within the existing banks of the river and the associated flood control project. According to Title 25 105.91, the hazard call of the proposed inflatable structure will be Class 3 (dams or reservoirs that do not cause loss of life or serious damage to property if a failure of the dam occurs) (Gannett Fleming Inc., March 2007, pg. 21). The applicant's preferred alternative will not have a direct adverse effect on the Wyoming Valley Levee System levees and floodwalls.

9. Floodplain Values - The project as proposed, may have minor negative impacts to portions of the adjacent floodplains riverward of the levees. Specifically, as seen in the aerial photograph below, a portion of the area riverward of the levees, (or within the pool area upstream of the levees on the south. side), is existing floodplain area (see Figure 4 below). This floodplain area mainly consists of mature, deciduous, floodplain forest community primarily dominated by silver maple, red maple, and box elder (Gannett Fleming, Inc., May 2005 – Enclosure A, pg. 1).

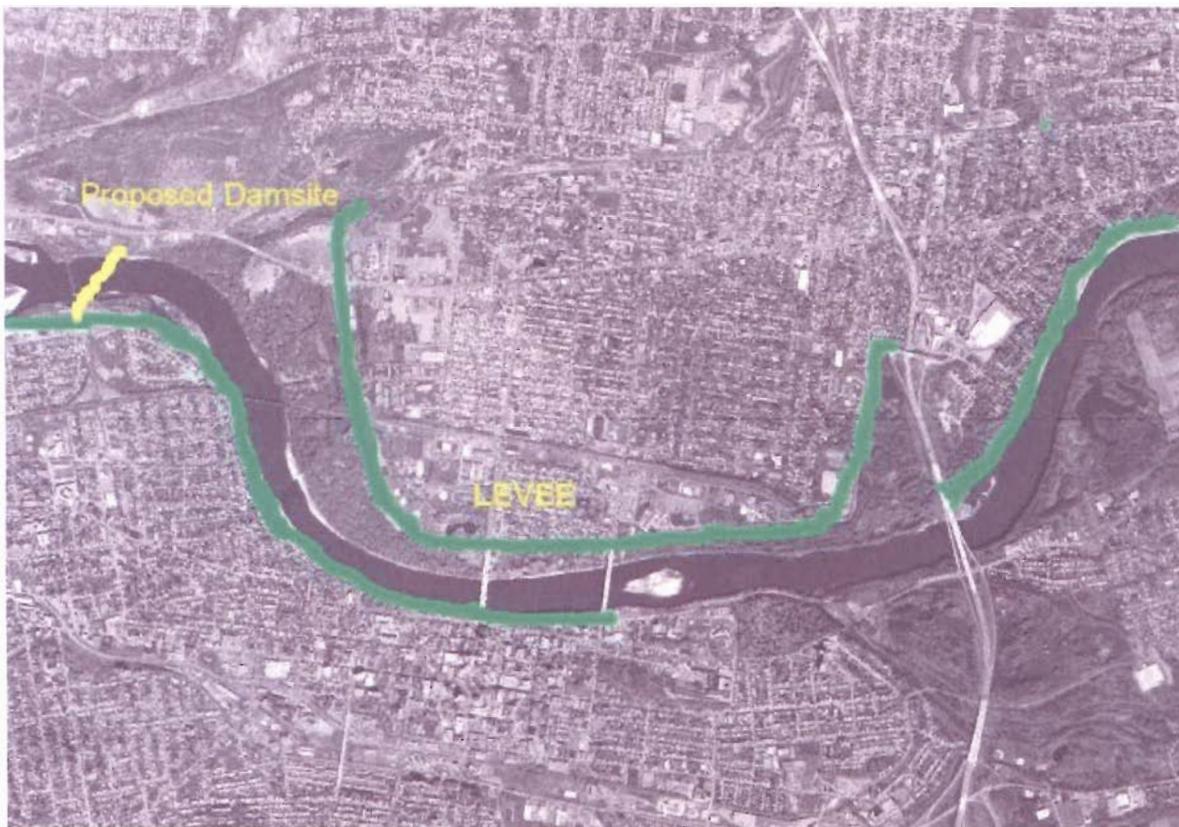


Figure 4: Existing levees/floodwall within the 4.5 mile proposed pool area. (Source:Gannett Fleming, Inc., Power Point Presentation, February 28, 2003, entitled *Wyoming Valley Inflatable Dam Project Feasibility Study*)

The natural flow regime which currently exists in the Susquehanna at Wilkes-Barre, allows the movement of water and sediment within the channel and between the channel and the floodplain.

This flow regime will continue in the subject floodplain areas currently remaining between the River and the levees.

However, there is the potential for alterations in soil saturation to occur within the floodplain, affecting the floodplain vegetative community. Specifically, floodplain soils typically alternate between being aerobic when not flooded and anaerobic, in at least the surface layers, in flood events. The alternation typically results in a vegetative community with shallow roots that spread in horizontal directions. This enhances the ability for material that enters the floodplain to be up taken by vegetation and stored. The anaerobic conditions also allow for denitrification which converts nitrogen into a less toxic form. Biological processing and storage on floodplains and upper banks is a principal control on quantities of material introduced into the waterways (Cummings, 1980). With the proposed structural impoundment, fringe floodplain areas that previously were subject to seasonal water fluctuations and now will remain saturated may be adversely impacted. These floodplain plant communities are adapted to periodic anaerobic conditions and the physical stress of moving water. This existing vegetation in the floodplain is not adapted for inundation of pooled water for consecutive weeks and months during the growing season. If the normal pool elevations were raised for a substantial amount of the growing season, it is reasonable to predict that existing vegetation in flood resistant riparian communities would suffer mortality. The loss of riparian vegetation would result in bank destabilization as well as a loss in its ability to conserve, cycle, and retard the inputs of nutrients, sediments and toxins. This impact would be limited to the areas as indicated above in the aerial depicting the remaining floodway fringe, riverward of the levee system.

Floodplain plant communities, above the pool elevation, may also be impacted by a higher water table for a longer period of time. This may favor non-native plant species that benefit from the shift in flood timing and duration. The applicant has agreed to monitor potential pool impacts upon floodplain forested wetlands communities should the project be approved.

10. Land Use – The proposed project will have no substantial impact on surrounding land uses. Current land uses surrounding the project area consist of floodplains situated on public lands consisting of three local parks on the north bank (Kirby Park, Nesbitt Park, and Riverbend Park) and private lands on the south bank. Situated between the Susquehanna River and the levee system, land use consists of a mature, deciduous, floodplain forest community dominated by silver maple, red maple, and box elder. The forested floodplain communities northeast of the Black Diamond Railroad Bridge are currently being used as a local park system (Kirby Park). In the vicinity of the Market Street and North Street Bridges, the land use changes to a mixture of forested and herbaceous communities (Nesbitt Park). Between the North Street Bridge and the S.R. 309 Bridge is Riverbend Park; the floodplain community is primarily forested. The north bank of the River is narrow and contains primarily urban land uses associated with residences, commercial business, industry, and transportation. Private land consisting of a mixture of reclaimed mine areas, mature deciduous floodplain forest, active agriculture (row crops), and active acid mine discharge area (Plainsville Borehole) occupy the majority of the south bank at the upstream limits of the proposed impoundment (Gannett Fleming, Inc., May 2005- Enclosure A, pg.2). None of the existing land uses will change as a result of the proposed project.

11. Navigation –The proposed project will have minor negative impacts on navigation for certain boaters. The proposed pool will degrade the connectivity with downstream waters and alter the pass through boating experience for kayakers and canoeists, although provisions will be provided for portaging.

The applicant has stated that deeper water created by the structure will not improve navigability for larger boats. This conclusion is due to the fact that the narrow width and shallow depth of the river in the location of the proposed pool will not permit use by larger water craft such as, power boats, sailboats, and large pontoon boats. The applicant has also stated that water skiing will not be permitted, however they expect an increased usage by smaller watercraft (Gannett Fleming, Inc., March 2007, pg. 4).

The PAFBC is the responsible regulatory agency for boating activities. Although there will be trade offs in the type of recreational boating because pass through boating will be diminished, the PAFBC did not comment on boat usage. Therefore, the Corps cannot reach conclusions regarding the type and draft of vessels that will be able to safely operate in the pooled area and can not assess if the results of the trade off will be positive or negative.

12. Shore Erosion and Accretion – The applicant’s preferred alternative will adversely affect existing shoreline banks and accretion patterns during the lifetime of the impoundment facilities. Raising an inflatable structure will inundate the riparian shoreline. As discussed in the public interest review factor 9, an impounding structure, which will be inflated during the growing season, will likely impact riparian vegetation. Some erosion of the river bank can occur as a result of wave action from winds blowing across the recreational pool and/or boat wakes when the river’s water level is maintained at its normal recreational pool level during the recreational season. More erosion can occur as the banks slough or cave into the river during drawdown of the recreational pool when the water escapes from the weakened banks. The cycle of inflation and deflation of the bags that will occur from year to year will result in cumulative sloughing and erosion of the banks.

Although the applicant has stated that there will be a no wake zone at Wilkes-Barre, they have not provided any hydrologic and hydraulic (H&H) or geotechnical analysis documenting that there will not be erosion during deflation of the bags when the water leaves the saturated banks or from wind driven waves that will attack the banks when the dam is inflated. The existing unprotected riverbank slopes would need to be monitored for erosion and if found to occur, mitigation measures would need to be taken to prevent erosion. Of particular concern is the reach between Station 88+00 and Station 97+00 (on the left side looking downstream). The original levee project drawings show that the lower portion or toe of the riverside slope in these areas is protected with rip rap. However, there is no visual evidence of rip rap along these areas. The reach from the Pierce Street Bridge to just downstream of Union Street Pump Station (on the left side looking downstream), where the proposed pool will inundate the riverside floodplain up to the toe of the existing riverbank/levee slope, does not currently have rip rap protection. Further investigation of these areas would need to be performed to verify the condition of the riverside slope and potential for erosion (USACE, 24 January 2008).

An inflatable structure is a physical barrier which, by itself, will adversely impact sediment transport and therefore erosion and accretion. "For a stream to be stable it must be able to consistently transport its sediment load, both in size and type, associated with local deposition and scour" (Rosgen, 1996). The construction of the physical barrier interrupts a fluvial river system and attempts to make a regulated habitat. Because the inflatable structure will influence the movement of water and sediment during the recreational pool season, the ability of the river to transport sediment and the amount of sediment for transport will be altered during this time. Instead of being consistently transported, the sediment trapped at the structure, when the bags are inflated, will be released in slugs during times when the bags are deflated. During the recreational season, if the transport capacity exceeds the available supply, a sediment deficit exists and the channel can be expected to find its needed sediment from its bed and/or banks. Typical downstream responses can include channel bed degradation or incision, textural changes and lateral adjustment, including both expansion and contraction of channel width.

The applicant has not provided sufficient information to address the magnitude of this component of impact.

13. Recreation – The proposed project will have an adverse impact on recreation.

The Susquehanna River has been identified for boating, fishing, water contact sports (swimming) and aesthetics, by the Commonwealth. The applicant has stated in their feasibility study that "without meaningful water quality improvements, the present conditions in the Susquehanna River at Wilkes-Barre limit recreational use of the proposed impoundment to those activities that do not involve significant primary contact" (Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-24).

As indicated in the water quality section of this public interest review, fecal coliform concentrations that have been measured in the area render water quality that is extremely questionable for swimming with or without the applicant's proposed alternative. The mere presence of more quiescent waters with a stable water level would attract people to the water for swimming. The applicant has proposed to monitor water quality and provide notice of water quality problems to the public, in order to partially mitigate these impacts (Gannett Fleming, Inc., July 2006, pg. 44-48; Gannett Fleming, Inc., March, 2007, pg. 29). However, even with the proposed mitigation measures, the applicant's preferred alternative is more likely than not to increase adverse public health impacts as compared to the without project condition and as compared to any of the alternatives that do not involve an impoundment. This concern is reinforced by the USEPA which has stated that "the impoundment of poor quality river water may pose significant risks to human health from exposure to bacterial pathogens" (USEPA, December 8, 2005, pg. 2).

In addition to using operational flexibility to allow CSO flows to pass, the applicant proposes to address CSO impacts on the proposed recreational pool by implementing a detailed public notification and advisory program as a permit contingency (Gannett Fleming, Inc., March 2007,

pg. 29). To date, no details have been provided by the applicant on their proposed notification and advisory program.

The PAFBC is the responsible regulatory agency for boating activities and no information has been provided to support the applicant's assertion that the impoundment will result in increased boating. There will be trade offs in the type of recreational boating because pass through boating will be diminished. However, because the PAFBC did not comment on boat usage, the Corps cannot reach conclusions regarding the type and draft of vessels that will be able to safely operate in the pooled area. Therefore, we do not know if the results of the trade off will be positive or negative.

14. Water Supply and Conservation – The proposed project will not impact water supply. The Susquehanna River at Wilkes-Barre is not a source of potable water. The project as proposed does not represent a 'consumptive use' of water.

15. Water Quality - The responsibility for providing a water quality determination for this project lies with the PADEP's Water Management Division. To date, no 401 Water Quality Certification has been issued. However, based upon the information received to date, PADEP has stated that the applicant's current permit application has not adequately demonstrated, by documentation and studies, that the project will not "result in potential adverse impacts to water quality in the Susquehanna River" (PADEP, November 16, 2006, pg. 1).

The Corps concludes that the proposed impoundment will have a negative adverse impact on water quality for recreational uses involving water contact. This conclusion is based on the analysis below.

Water quality in the Susquehanna River in the vicinity of Wilkes-Barre is periodically degraded by CSOs. According to the applicant, "there are currently 16 CSO outfalls within the limits of the proposed impoundment, with an additional 23 CSO outfalls upstream between Forty Fort and West Pittston" (Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-14). An additional 103 CSO's discharge into the Lackawanna River, a tributary to the Susquehanna River about nine miles upstream of the proposed structure (USEPA, November 2005, pg.1). The applicant, also indicates that "the success of either Option 2 (Inflatable dam with limited landside improvements or Option 3, (the inflatable dam with significant recreational facilities and enhanced landside access) is based on the assumption that the CSO problem is corrected"(Gannett Fleming, Inc., May 2005 – Appendix B, pg. ES-24).

A major concern associated with CSOs is the attraction of people to the impoundment and consequent increased potential for exposure to contaminants contained in the CSOs, particularly potential pathogens. Analysis of the applicant's fecal coliform data below indicates the severity of this concern.

The applicant's consultant performed a water quality study in 2004 (Gannett Fleming, Inc., May 2005 - Appendix G). They sampled 11 stations approximately monthly from

May 2004 through November 2004. Four of the water quality sampling stations were in the area of the proposed pool – stations 002, 003, 004 and Tang Creek.

One of the parameters that the applicant's consultant sampled and analyzed was fecal coliforms. This is a significant parameter, because it is an indicator of the suitability of water quality for swimming. The PADEP established maximum fecal coliform level during the swimming season (May 1 through September 30) is the geometric mean of 200 per 100 milliliters (ml) based on a minimum of five consecutive samples, each sample collected on different days during a 30-day period. PADEP standards also require that no more than 10% of the samples taken during a 30-day period may exceed 400 per 100 ml. While multiple samples were not collected and analyzed in any single 30-day period at any single location, it is instructive to review the available data in light of the 200 per 100 ml and 400 per 100 ml limits.

Data in Gannett Fleming, Inc., 2005, for the four stations within the proposed pool from May 1 through September 30, 2004, shows that:

- Twenty-one total samples were taken.
- Fourteen of these samples or 67% exceeded 200 per 100 ml.
- Ten of these samples or 48% exceeded 400 per 100 ml.

Gannett Fleming, Inc., indicated that the September 24, 2004, data were a reflection of the impacts of Hurricane Ivan on water quality and might not be representative of water quality under "normal" swimming season conditions. Re-analysis of the data without the September 24, 2004, sampling data shows that:

- Eighteen total samples were taken.
- Eleven of these samples or 61% exceeded 200 per 100 ml.
- Seven of these samples or 39% exceeded 400 per 100 ml.

Even using the re-analyzed data above, under the without project condition, the suitability of water quality for swimming is, at a minimum, extremely questionable based on the above-cited data. Existing water quality for swimming, using fecal coliforms as a metric, is not expected to improve with construction of the applicant's preferred alternative and could be exacerbated due to reduced water velocities that would reduce mixing. Further, the mere presence of more quiescent waters with a stable water level would attract people to the water for swimming. The applicant has proposed to monitor water quality and provide notice of water quality problems to the public, in order to partially mitigate these impacts (Gannett Fleming, Inc., July 2006, pg. 44-48; Gannett Fleming, Inc., March, 2007, pg. 29). However, even with the proposed mitigation measures, the applicant's preferred alternative is more likely than not to increase adverse public health impacts as compared to the without project condition and as compared to any of the alternatives that do not involve an impoundment.

In addition to pathogens, CSOs may impair water quality for recreational uses due to suspended solids and turbidity.

The applicant has proposed to use operational flexibility to mitigate water quality concerns associated with CSOs. PADEP indicates that “The assertion in the application that the dam is likely to be deflated when CSO loading of fecal coliform is maximized is inadequate to assure protection of the public and recreational water uses” (PADEP, November 16, 2006, pg. 2). PADEP is “particularly concerned with the dynamic condition resulting from a thunderstorm following a period of extended dry weather when river flow is low” (PADEP, November 16, 2006, pg. 2).

Despite the applicant’s own assertion that the success of the inflatable structure “...is based on the assumption that the CSO problem is corrected...”, at this time, the Corps is aware of only two (2) CSOs currently being eliminated. The two CSOs will be eliminated by the WVSA (WVSA, May 1, 2006, pg.1).

The Corps concludes that the proposed impoundment will have a negative adverse impact on water quality for recreational uses involving water contact.

16. Energy Needs – The proposed project will not affect energy consumption or generation.

17. Safety – The proposed project will, under certain circumstances, negatively impact safety. The proposed structure is a low-head structure or weir, akin to a low-head dam. Low-head dams have been recognized by the Commonwealth of Pennsylvania (PAFBC) as the most dangerous kind of dam on a river or stream. Low-head dams are characterized by impounding water completely within the banks and passing flow directly over the entire structure within the banks, excluding abutment, to a natural stream channel. Low-head dams, because of their short drop, have the appearance of being safe and the current forces can be deceptive. As a result, waders, recreational boaters, anglers, and/or swimmers are more likely to underestimate the force of the current and be pulled into the force of the evacuating water near the structure. Once over a low-head dam, under certain conditions, a person will be carried to the face of the dam. The force of the evacuating water will push a person down to the base of the dam. If able to resurface, the force of the backwash will carry the victim back towards the dam and down again, continuing the cycle. Any debris such as logs or rocks caught in the back wash can complicate matters for the victim. In short, “low-head dams” pose a substantial threat to all users under certain circumstances.

The safety risk associated with the characteristics of a low head dam will be minimized to boaters because the proposed impoundment will be regulated by PAFBC. Additionally, a PADEP letter dated November 16, 2006, indicates that “Act 91 of 1998 requires that the permittee mark the areas above and below the dam and on the banks immediately adjacent to the dam with signs and buoys of a design and content determined by PAFBC.....”

The safety risk of flooding during high river flows or during uncontrolled releases is minimal. The applicant’s Emergency Action Plan submitted with their May 2005 permit application stated that an uncontrolled release of the reservoir pool will be entirely contained within the existing banks and associated flood control project (Gannett Fleming, Inc., March 2007, pg.21).

The safety risk of controlled releases will be regulated by PAFBC through the use of appropriate signage, buoys, and markers that will be installed at and around the proposed structure to ensure the safety of users. Recreational users should not experience a noticeable change to river conditions as minor adjustments are made to maintain a water elevation of 517 feet NGVD (Gannett Fleming, Inc., March 2007, pg. 22).

There is significant concern associated with the health/safety risk posed to recreational bathers. Excessive levels of fecal coliforms, which have already been documented to exist at the proposed structure location, are an indicator that primary contact recreation in the area could make users sick. The applicant has proposed to have a public warning system to mitigate the health/safety risk factor. To date, details on such a warning system have not been provided.

Even with the applicant's proposed safety measures in place, the Corps finds that the proposed project will negatively impact safety.

18. Food and Fiber Production – The proposed project will not have a negative impact on food and fiber production. The area to be impacted by the project is not used for commercial or private food production.

19. Mineral Needs – The proposed project will not have a negative impact on mineral needs. There are no known minerals available in the project area. Therefore, no impact to minerals is expected from the project.

20. Consideration of Property Ownership – The Commonwealth of Pennsylvania owns the river bottom at the project location site and the waterway is considered both “waters of the U.S.” and “waters of the Commonwealth”. Because ownership will not change, there are no impacts to property ownership associated with the applicant's preferred alternative.

21. Civil Works Flood Control Project and Related Infrastructure - The Applicant's preferred alternative will not have a direct adverse effect on the WVLRP levees and floodwalls. However, the applicant's preferred alternative will affect access for maintenance and inspection activities associated with the WVLRP, submerge the toe of slope in certain areas which will require future monitoring for erosion, may have the potential to affect and disrupt the WVSA system, and may adversely affect WVLRP flood control pump stations.

The proposed pool will submerge a portion of the Wilkes-Barre riverside stability berm between levee station 59+00 and 85+00, which will eliminate access for maintenance of the riverside slope for the proposed pool. This will require that the WVLRP inspections and maintenance to be scheduled when the pool is down. The proposed pool will inundate the floodplain up to the toe of the existing riverbank/levee slope between Station 88+00 and 97+00. This may result in erosion from wave action within the proposed pool.

The levee embankment from the Pierce Street Bridge to just downstream of the Union Street Pump Station is constructed on top of the natural riverbank, a slope which is not

currently protected with rip rap. Erosion protection would need to be considered in this reach (see public interest review factor 8).

There are five (5) locations where sanitary and flood control stations will be affected by impacts to CSO operations. Those locations are: 1.) Old River Road (Wilkes-Barre), 2.) Ross Street (Wilkes-Barre), 3.) Union Street (Wilkes-Barre), 4.) Loveland Avenue (Edwardsville Borough) and 5 Church Street (Kingston Borough) (Gannett Fleming, Inc., May 2000). The WVSA Sanitary Pump stations at each of these locations are not designed to accept the additional inflow that the proposed seasonal pool may create, since the proposed lake elevations are several feet higher than the CSO diversion weir settings. For the flood control stations, the additional standing/stagnant water in the CSO line may require advance replacement of the gates, pumps and any other metal parts in the stations due to possible increased leakage and seepage (USACE, January 24, 2008). These impacts will need to be monitored and possibly mitigated by the applicant. Mitigation for the flood control stations could involve more frequent than expected replacement of the deteriorated components, or if feasible, replacement of parts with more resistant (and more expensive) materials. It is expected that this will increase the originally anticipated operation and maintenance (O&M) costs of these flood control pumping stations. The O&M costs of these stations are the responsibility of the Luzerne County Flood Protection Authority, which is also the permit applicant for the proposed inflatable structure. Mitigation for the WVSA Sanitary Stations will require more detailed analysis, and may require a different approach to operation of the CSO system. No impacts to the pumping stations will occur when the structure is deflated.

XI. Cumulative Impacts:

Cumulative effects are defined by the Council on Environmental Quality (CEQ) guidelines for implementing the National Environmental Policy Act (NEPA) as “the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7).

In assessing the potential cumulative effects or impacts the Corps has considered the specific adverse impacts from this proposed project, and then considered these in a regional or watershed context; specifically in consideration of other similar such projects, past, existing and reasonably foreseeable, within the watershed and region where these impacts are likely to extend.

As detailed in the Public Interest Review analysis, the Corps has concluded that this proposed project with an impounding structure across the Susquehanna River would have an adverse impact on riffle and pool complexes, anadromous finfish, eels, resident fish, native mussels, benthics, sediment transport, bank stabilization, riparian vegetation, water quality, wetlands, habitat diversity, and human safety.

Some of these impacts are localized and not regionally cumulative in terms of being additive when considered in the context of other similar projects. These would include

benthics, sediment transport, bank stabilization, riparian vegetation, water quality, wetlands, habitat diversity, and human safety. Others however extend further in reach and will have a cumulative or additive impact when viewed within the context of cumulative effects as defined for purposes of NEPA. These would include impacts upon anadromous finfish, eels, resident fish, native mussels and riffle-pool complexes.

The next component in determining cumulative effects on these resources is to assess the past, present and reasonably foreseeable future actions of a similar nature that may occur within the watershed or region that would be potentially impacted by such actions. The scope of consideration for such an assessment would be limited to the Susquehanna River and its primary tributaries where such actions may be feasible; with recognition that such actions in these areas will for some of these factors, extend to further upstream reaches and tributaries of these larger rivers. A sub-component here would also be to first define what type of action would constitute an action of 'a similar nature'.

In defining actions of a similar nature, while this structure is an 'inflatable' structure, it will create a blockage to the natural flow dynamics and the movement of the aquatic species discussed above. Even when deflated, inflatable structures create a 12- to 18-inch elevation change that creates a weir effect that reduces resident fish migration. Relative to potential cumulative impacts resulting from this action, similar actions can be considered to be other structures that block the flow and aquatic movement within the Susquehanna River Basin. This would include both permanent and inflatable weirs, and permanent or inflatable dams.

In defining all actions, past, present, and reasonably foreseeable, there are currently several dams on the main stem of the Susquehanna River, including four (4) hydropower dams, an inflatable Fabri-dam (Sunbury) and a low-head dam (Harrisburg) on the lower Susquehanna River.

With regard to 'reasonably foreseeable', in recent years there have been various proposals for an inflatable dams elsewhere on the Susquehanna River, including one on the North Branch of the Susquehanna River (Towanda, PA) and two on the Chemung River (New York), the major headwater tributary to the Susquehanna River.

This proposed project when considered in light of other past, present and reasonably foreseeable actions within the Susquehanna River Basin as discussed above, would result in cumulative adverse impacts to anadromous finfish, eels, resident fish, and native mussels which require free movement, either from the confluence to upstream reaches, or in the case of resident species, within long unobstructed stretches of riverine habitats to complete their lifecycle needs.

With regard to riffle pool complexes, these areas are special aquatic sites and as such, not only provide localized habitat but are important in maintaining biodiversity and overall productivity (biomass capacity) within the River. Based on our familiarity with the Susquehanna River and primary tributary rivers, these additional structures/impoundments (if constructed) would potentially contribute to, and result in,

additional adverse impacts to similar aquatic resources as those which would be impacted by the proposed WBIS.

Biological diversity would also be impacted in localized ways as each such structure would degrade the quality of the aquatic community within the proposed pool through modifications to the nature and diversity of existing riverine habitats. The cumulative impact of several additional pools within the Susquehanna River and/or its major tributaries would be minimal given their relative river length as compared to non-impounded reaches and given that there would not be more than several such additional structures proposed and constructed, in terms of what the Corps has determined is 'reasonably foreseeable'.

XII. Determinations and Conclusions:

The Clean Water Act's purpose is to restore and maintain the chemical, physical, and biological integrity of the waters of the US. Consistent with that overall purpose, the Clean Water Act Section 404(b)(1) Guidelines which contain the environmental criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the US, state two key policies at 40 CFR 230.1.

- (1) Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with other known and/or probable impacts of other activities affecting the ecosystems of concern.
- (2) From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special aquatic sites may represent an irreversible loss of valuable aquatic resources.

The Clean Water Act declares a national goal to be elimination of discharges of pollutants (e.g., fill) into navigable waters. The CWA requires that such discharges are only permissible if determined to be in compliance with Section 404 of the CWA. In turn, the Corps permit regulations require that only discharges that comply with the 404(b)(1) guidelines may be permitted. In addition, one of the primary requirements of the Guidelines is that no discharge can be permitted if there is a practicable alternative with less adverse impact on the aquatic ecosystem (unless the identified alternative poses other significant environmental consequences). The alternatives test is applied more rigorously for projects that are proposed to be located in special aquatic sites when the project is not water dependent. Special aquatic sites include: wetlands, coral reefs, mud flats, riffle pool complexes in streams, vegetated shallows, and sanctuaries and refuges.

The Corps' evaluation of a Section 404 permit application is a two part test which involves determining whether the project complies with the Section 404(b)(1) Guidelines

and is not contrary to the public interest (33 CFR 320.4). A permit must be denied if the project fails to comply with the Guidelines or is found to be contrary to the public interest.

I have reviewed and evaluated, in light of the overall public interest, the documents and factors concerning this permit application as well as the stated views of other interested agencies and the concerned general public. In doing so, I have considered the possible consequences of this proposed work in accordance with regulations published in 33 CFR Parts 320 to 330 and 40 CFR Part 230. The following analysis concludes that the proposed Wilkes-Barre Inflatable Structure project does not comply with the Clean Water Act Section 404(b)(1) Guidelines and is contrary to the public interest.

As discussed above, under Section 230.10(a) of the Guidelines, a permit must be denied for failing to comply with the Guidelines if an alternative exists that meets three criteria: (1) the alternative is practicable, (2) the alternative has less adverse impacts to the aquatic environment, and, (3) the alternative does not have other significant adverse environmental consequences. Where the activity associated with a discharge is proposed in a special aquatic site (as defined in Section 230, Subpart E), including wetlands and riffle-pool complexes, and does not require access or proximity to or siting within these types of areas to fulfill its basic project purpose (i.e., the project is not “water dependent”), practicable alternatives that avoid special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. The guidelines also impose an “explicit, but rebuttable presumption that alternatives to discharges in special aquatic sites are less damaging to the aquatic ecosystem and are environmentally preferable.” To pass the guidelines the Corps must be clearly persuaded that both of these presumptions have been clearly rebutted. (40 CFR 230, and 45 Fed. Reg. 85339 preamble to the Section 404(b)(1) guidelines).

The Corps has field reviewed the proposed project site and impact areas on several occasions, and given careful consideration to the materials and analyses submitted by the applicant and its consultant in support of the proposed structure. Biologists from the Corps and other Federal and State agencies that are part of the consultation process for Corps permit evaluations have visited the site, gathered existing data and information, and evaluated the proposed project in light of the existing regulations. Engineers from the Baltimore District have given due consideration to the potential impact of the proposed WBIS on the Wyoming Valley Levees System and related infrastructure. Furthermore, the Corps regional economist performed an analysis of regional economic development benefits for the proposed project and various other alternatives. Finally, my staff have carefully reviewed and considered the information and comments provided by USEPA, USFWS, PAFBC, PAGC, NY DEC, members of Congress, various organizations and special interest groups, and the general public, including impacted members of the regional community, as part of the permit application review process. This information was provided through public notice responses, meetings, and a formal public hearing. The final results of this comprehensive analysis are presented below.

The Corps has concluded that any alternative that includes the WBIS across the Susquehanna River would impound 4.5 miles of a large free-flowing river and would have an adverse impact on riffle-pool complexes, wetlands, anadromous finfish, eels, resident fish, native mussels, sediment erosion and accretion, water quality, habitat diversity, benthic ecosystem, riparian vegetation, and safety. In addition, there is a high degree of uncertainty regarding whether an inflatable structure will provide the purported enhanced recreational opportunities, which are an integral and fundamental part of the overall project purpose. This uncertainty is troubling recognizing that the proposed impoundment will have substantial direct and indirect impacts to the aquatic environment (see Table 7) and involves substantial expenditure of public funds.

The Corps' concerns with the proposed Wilkes-Barre inflatable structure across the Susquehanna River are heightened by the availability of practicable alternatives to the proposed discharge that have less adverse impacts on the aquatic ecosystem, without having other significant adverse environmental consequences, while substantially achieving the overall project purposes. The Corps concludes that the record clearly demonstrates that the Riverfront Development Plan and the West Bank Development Plan (alone or in combination) are less damaging alternatives when compared to the proposed project, and would not result in other significant adverse environmental consequences as described in Section 230.10(a).

The RDP alone or in combination with the West Bank RDP are clearly less damaging, as they would not impound the river and would not have the adverse impacts to anadromous finfish, eels, resident fish, native mussels, sediment erosion and accretion, water quality, wetlands, riffle-pool complexes, habitat diversity, benthic ecosystem, riparian vegetation, and safety as compared to the proposed project. These alternatives are available and capable of being done after taking into consideration cost, logistics, and existing technology in light of overall project purposes. The Corps has determined that the RDP (without an impounding structure on the River) would realize an estimated 83% of the Regional Economic Development benefits as defined by the applicant's preferred alternative without having the uncertainties associated with an inflatable structure and without having other significant adverse environmental impacts. The Corps is unable to calculate RED benefits for the West Bank Development Plan.

Therefore, in summary, the Corps finds that the RDP, with or without inclusion of the West Bank Development Plan, is less damaging to the aquatic ecosystem and does not have other significant adverse environmental consequences. Because of the clear availability of practicable alternatives to the applicant's preferred alternative, the Corps finds that the Wilkes-Barre inflatable structure alternatives do not satisfy Section 230.10(a) of the Section 404(b)(1) Guidelines.

Under Section 230.10(b) of the Guidelines, a permit must be denied if it causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standards. Although not factoring into my decision, I note for the record that a Water Quality Certification (WQC), required by section 401 of the Clean Water Act is required for the proposed project. The WQC determination is

delegated to the States, and in this case is part of the application by the applicant to PADEP under Pennsylvania's Dam Safety and Encroachment Act, but has not been acted upon by PADEP as of the date of this Corps decision.

The general conclusion to be drawn from national HQUSACE guidance on the Section 404 program is that the Corps should interpret and implement the Clean Water Act Section 404(b)(1) Guidelines, as well as the Corps Public Interest Review, in a manner which recognizes that most special aquatic sites serve valuable ecological functions. Such valuable special aquatic sites are present in this instance, and should be protected from unnecessary destruction. I take this mandate seriously and have rendered this Department of the Army permit decision with full consideration given to the HQUSACE guidance and mandates; as well as to the special protection afforded these areas under the Guidelines (40 C.F.R. § 230.10(a)(3)).

a. Compliance with Section 176(c) of the Clean Air Act Rule Review: Section 176(c) of the Clean Air Act General Conformity Rule Review: The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed *de minimis* levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. Because we are denying this permit action, a conformity determination is not required.

b. Environmental Justice: Environmental Justice: In accordance with Title III of the Civil Rights Act of 1964 and Executive Order 12898, each Federal agency must ensure that all programs that affect human health or the environment do not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin. Each Federal Agency must analyze the environmental effects, human health effects, economic effects, and social effects of Federal actions, including effects on minority communities and low-income communities. Denial of this permit is not expected to discriminate on the basis of race, color, or national origin, nor should it have a disproportionate effect on minority and low-income communities.

c. Title III of the Civil Rights Act of 1964 and Executive Order 12898: In accordance with Title III of the Civil Rights Act of 1964 and Executive Order 12898, each Federal agency must ensure that all programs that affect human health or the environment do not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin. Each Federal Agency must analyze the environmental effects, human health effects, economic effects, and social effects of Federal actions, including effects on minority communities and low-income communities. Denial of this permit will not have an adverse effect on minority or low income communities.

d. Compliance with Clean Water Act Section 404(b)(1) Guidelines: The discharge fails to comply with the requirement of these Guidelines because there is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem and that alternative does not have other significant adverse environmental consequences.

e. Compliance with Public Corps Interest Review: In addition, with regard to the Corps public interest review, I have weighed and balanced the benefits of the project against the reasonably foreseeable detriments and have determined that the detriments outweigh the benefits; accordingly, the proposed project is contrary to the public interest. Therefore, a Department of the Army permit for the proposed Wilkes-Barre Inflatable Structure is denied, and I will inform the applicant of my decision.

f. Compliance with Finding of No Significant Impact (FONSI): From the foregoing considerations and conclusions, it is my finding that denial of the requested permit would not constitute a major federal action that would significantly affect the quality of the human environment. This constitutes a FONSI. As a consequence, I find that an Environmental Impact Statement is not required by the provision of Section 102 of the National Environmental Policy Act, P.L. 91-190, or 42 U.S.C. § 4332, or by the applicable implementing Corps of Engineers regulations and guidance. This FONSI was prepared in accordance with 33 CFR 325 Appendix B, Paragraph 7a.

Table 7. Alternatives & Impacts to Waters of the U.S., Including Special Aquatic Sites

Alternative	Permanent PFO Impacts (acres)	River Miles Inundated	Permanent Stream Impacts (acres)	Rifle Pool Complex (acres)	Potential Impacts to Floodplain PFO Wetlands (acres)	PFO/PEM Temporary Impacts (acres)	Temporary Stream Impacts (acres)
1 – No Action	0	0	0	0	0	0	0
2 – Riverfront Development Plan (RDP)	0	0	0.77	0	0	0	0
3a – Inflatable Structure with Denil Fish Way	1.03	4.5	1.73	13.35	13	0.92	2.81
3b – Inflatable Structure with Vertical Slot Fish Way	1.06	4.5	1.79	13.35	13	0.89	3.68
3c – Inflatable Structure with Operational Flexibility	1.03	4.5	1.63	13.35	13	0.92	2.69
4 – RDP & Inflatable Structure with Denil Fish Way	1.03	4.5	2.50	13.35	13	0.92	2.81
5 – RDP & West Bank Development Plan (WBD) & Inflatable Structure with Denil Fish Way	1.03	4.5	2.64	13.35	13	0.92	2.81
6 – RDP & WBD	0	0	0.91	0	0	0	0

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13 February 2008

APPENDIX A

Appendix A contains the summary of comments from organizations and individuals from PN #05-42, PN #06-41, and from the May 1, 2006, Public Hearing. This section also contains the applicant's response to these comments (where appropriate) and Corps responses to these comments.

PN # 05-42: In response to the public notice which advertised an inflatable structure with a vertical slot fish way design, dated October 10, 2005, we received 12 comments of support from individuals and organizations, 26 comments of opposition from individuals and organizations, and comments from one individual, Mario Fiorucci, who had not taken a clear position but requested additional information.

Of the ten (10) individuals and two (2) organizations that support the project, there were ten (10) main issues identified as the reasons for support. The issues, in order of frequency mentioned, are as follows:

<u>Issues</u>	<u>Individuals & Organizations</u>
1. Create improved conditions for crewing	7
2. Revitalize the community	6
3. Provide economic development	5
4. Serve as a catalyst for environmental restoration/stewardship	3
5. Change perception of the Susquehanna for the better	1
6. Attraction for current and prospective students to Kings College	1
7. Provide urban recreation	1
8. Provide a reliable recreation pool	1
9. Increase property values	1
10. Opportunities of environmental research and education	1

Table A-1 identifies the comments and issues supporters of the project made in response to PN # 05-42.

Table A-1. Comments/Issues from Individuals & Organizations Support for Proposed Project (PN # 05-42)										
Commenter	1	2	3	4	5	6	7	8	9	10
Susquehanna River Watch		X	X	X			X	X	X	X
Greater Wilkes-Barre Chamber of Business & Industry			X							
Patricia Last						X				
Robert Yurick		X		X	X					
John Augustine		X	X	X						
David Gold	X	X								
Curt Wiser	X									
Erin Simpson	X	X								
Ashley Maresca	X									
Todd Ankiewicz	X	X								
Ryan Resanovich	X		X							
Todd Weibel	X		X							

- *Corps Response: The Corps has considered and addressed these comments in public interest review factors 1, 2, 3, 4, 5, 7, 13, 15, and 17.*

Of the twenty one (21) individuals and five (5) organizations that oppose the project, eighteen (18) of them requested a public hearing. The comments of opposition had sixteen (16) main issues as the reasons for opposition. The issues, in order of frequency mentioned, are as follows:

<u>Issue</u>	<u>Individuals & Organizations</u>
1. Water Quality	19
2. Impounding a free-flowing river	13
3. Affects on current recreational users	10
4. Impacts on fisheries	9
5. Maintenance costs/burden on the taxpayers	9
6. Impacts to native/migratory birds	7
7. Safety	7
8. Degradation of a public/natural resource	5
9. Deforestation of along river/banks	3
10. Secondary impacts w/development	2
11. Alternatives	2
12. Wildlife habitat	2
13. Affects of volumetric flows during periods of high flow	1
14. Affects on existing levees	1
15. Wetlands	1
16. Siltation behind impoundment	1

Table A-2 Identifies the comments and issues opponents to the project made in response to PN # 05-42.

- *Applicant's Response: The applicant addressed the majority of these comments under resource com the resource agency comments (Item #7 of this EA) for PN # 05-42. The remaining comments are addressed below:*

1.) *Impacts to native/migratory birds* - The applicant stated that an avian survey was conducted and concluded that there was no evidence that large-scale ecosystem or habitat changes would occur. There would be some affect on summer shoreline species, but riparian species would not be expected to be adversely affected as the proposed pool would be within the existing high-water mark of the river and there is no evidence that the project would affect the neighboring floodplain forest community.

2.) *Operation & maintenance* – In contrast to the inflatable dam in Sunbury, the applicant stated that the proposed inflatable structure at Wilkes-Barre would have an Obermeyer Hydro Gate System engineered for frequent adjustments to inflation and structure height based on fluctuating river conditions, thus eliminating volumetric flows during high water events. The applicant stated that a basic operation and maintenance plan was submitted as part of the original permit application and that a detailed plan to the Corps and PA DEP's satisfaction would be submitted if the permit approval is imminent.

3.) Affects on existing levees - The applicant stated that the inflatable structure and associated impoundment will remain within the bed and banks of the Susquehanna River, and would have no impacts on upstream and/or downstream existing levees.

- *Corps Response: The Corps acknowledges that tax payers would be responsible for construction and maintenance of the project. The Corps has considered and addressed the remainder of these comments in public interest factors 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, 20, and 21.*

Table A-2. Comments/Issues from Individuals & Organizations Opposed to Proposed Project (PN # 05-42)																
Commenter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
American Rivers	x			x	x	x	x	x			x					
Sierra Club	x		x	x	x	x			x	x		x				
Greater Wyoming Valley Audubon Society			x			x	x			x	x	x				
Blue Mountain Outfitters	x			x		x									x	
Susquehanna River Archaeological Center of Native Americans								x								
Donald Williams		x	x					x								
John Naudasher	x	x	x													
Brian Bausman	x	x	x													
Jim Bausman	x	x	x													
Martin Zoller	x	x	x													
Elaine Kravitz	x	x	x													
Zack Nelson					x											
Bonnie Wallace	x						x									
Kevin Brown		x														
Scott Cannon		x		x												
Mike Raykovicz	x															
Peggy Krapf	x				x											
Richard Fitzsimmons								x								
Diane Soudas	x			x	x	x	x		x							
Andrew Duvall	x	x		x				x	x							
Daniel & Karen Natt	x	x	x	x	x		x									
Mary Ann Keller	x	x		x	x	x	x									
William Cannon	x	x		x	x	x										
Louise Edwards	x	x	x													
Nick Souchik	x												x	x		x
Jean Demco	x				x		x									

May 1, 2006 Public Hearing:

To announce a May 1, 2006, public hearing, the Corps issued Special Public Notice #06-12. A comment period was opened from March 13, 2006 - May 15, 2006. Written and oral comments were provided as oral testimony at the May 1, 2006, public hearing. Comments were also received in either electronic mail format or written letter format in response to the public hearing Public Notice # 06-12. The Corps received 12 comments of support from individuals and organizations, and 173 comments of

opposition from individuals and organizations. All such comments have been consolidated into two (2) matrices, indicating those in support and those against; each matrix has a synopsis of the issues raised. In addition, please note that several comments were also received from elected officials and from Federal and State resource agencies either at the hearing or in letter form.

Of the ten (10) individuals and two (2) organizations that support the project, there were nine (9) main issues identified as the reasons for support. The issues, in order of frequency mentioned, are as follows:

<u>Issue</u>	<u>Individuals & Organizations</u>
1. Revitalize the community	9
2. Use by college rowing (crew) teams	8
3. Provide economic development	6
4. Serve as a catalyst for environmental restoration/stewardship	4
5. Create a usable recreational pool	3
6. Insure clean water in Susquehanna River	2
7. Change perception of the Susquehanna River for the better	1
8. Attraction for current and prospective students to Kings College	1
9. Enhance recreational use of the area	1

Table A-3 identifies the comments and issues supporters of the project made in response to the May 1, 2006, Public Hearing.

Table A-3. Comments/Issues from Individuals & Organizations Support for Proposed Project (Public Hearing)									
Commenter	1	2	3	4	5	6	7	8	9
Greater Wilkes Barre Chamber of Commerce & Industry	x		x	x	x	x			
Susquehanna River Watch	x	x	x	x	x	x	x		x
Robert Yurick	x			x	x				
Erin Simpson	x	x							
Ashley Maresca		x							
Todd Weibel	x	x	x						
Ryan Resanovich	x	x	x						
Curt Wiser		x							
David Gold		x	x						
Thomas O'Hara	x							x	
Todd Ankiewicz	x	x							
John Augustine	x		x	x					

- *Corps Response: The Corps has considered and addressed these comments in public interest review factors 1, 2, 3, 4, 5, 7, 10, 13, 15, 17, and 20.*

Of the one hundred sixty eight (168) individuals and five (5) organizations that oppose the project, there were twenty two (22) main issues identified as the reasons for opposition. The issues, in order of frequency mentioned, are as follows:

<u>Issue</u>	<u>Individuals & Organizations</u> (Includes 118 from signed petition)
1. Affects on current recreational users	144
2. The burden on the taxpayers	136
3. Human health concerns	135
4. Safety	130
5. Water quality	47
6. Impacts on fisheries and the aquatic ecosystem	24
7. Impounding a free-flowing river	20
8. Overall negative impact	18
9. Degradation of a public resource	15
10. Aesthetics (including noise from motorboats)	11
11. Impacts to migratory/resident birds or waterfowl	5
12. Siltation behind impoundment	5
13. Affects flood storage capacity/value of levees	4
14. Deforestation of banks/erosion	3
15. Impact to wetlands	3
16. Other available alternatives	3
17. Historical or archaeological impacts	2
18. Illegal (violation of Article 1 of PA constitution)	2
19. Affects on existing levees	1
20. Affects on existing land values	1
21. Sewer system issues	1
22. Section 9 of River & Harbors Act requirement	1

Table A-4 identifies the comments and issues opponents of the project made in response to the May 1, 2006 Public Hearing

Table A-4. Comments/Issues from Individuals & Organizations Opposed to the Project (Public Hearing)																						
Commenter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Blue Mountain Outfitters	x				x	x	x				x											
Audubon Society - Wyoming Valley Chapter (Robert Wasilewski)	x		x	x	x	x	x	x			x											
American Rivers (Sara Deuling)	x	x			x	x	x	x			x					x						
Sierra Club	x				x	x				x		x										
The Brookside League				x	x																x	
Luzerne Co. Residents Opposed to the Inflatable Dam (118 signatories)	x	x	x	x																		
Brian Mangan					x	x	x			x												
Edward Perry			x		x	x	x					x				x						x
Richard Fittsimons	x	x	x		x	x	x			x	x				x		x	x				
Frank Kratz	x		x	x	x		x	x		x												
Joseph Leonardi					x					x												
David Buck	x	x	x	x	x		x					x										
Paul Otruba			x		x	x																
Carl Naessig	x	x	x		x					x				x								
Norm Gavlick		x		x	x	x	x				x											
Martha Makos					x																	
Keith Dorton			x		x			x		x												
Robert Michale						x		x		x												
Carey Van Britsom					x																	
Mary Ann Keller	x		x				x	x							x							
Nick Souchik					x		x					x										
Zack Nelson	x				x			x														
Donald Williams	x			x	x		x	x														
Andrew Duvall					x	x	x														x	
Louis Edwards	x				x											x						

Table A-4. Comments/Issues from Individuals & Organizations Opposed to the Project (Public Hearing)

Commenter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Daniel & Karen Natt	x			x	x	x			x													
Mario Fiorucci	x				x								x									
Diane Soudas		x	x	x	x		x	x						x	x							
John Naudasher	x				x	x	x		x													
Brian Bausman	x				x	x	x		x													
William Cannon	x	x			x	x	x	x	x													
Scott Cannon						x		x														
Mike Raykovicz	x				x																	
Peggy Krapf		x		x	x				x													
Jean Demko								x														
Deb Twigg																	x					
Kevin Brown	x					x		x														
Bonnie Wallace	x		x		x																	
Jim Bausman	x				x	x	x	x														
Martin Zoller	x				x	x	x	x														
Elaine Kravitz	x				x	x	x															
Bonita Gower		x	x		x	x			x				x									
Thomas Glosser		x		x	x									x								
John Montague		x	x		x	x			x			x										
Pasquale Amico					x			x														
Mary Ann Novitsky								x		x												
James Whitonis		x																				
Alan Kornish		x			x																	
Samuel Bosch			x		x				x													
Thelma Bosch			x		x				x													
J.A. Jonovitch		x			x																	
Grace Ivers		x			x					x												
Stephen Laubach	x		x	x	x																	
Dan Shane	x	x	x	x	x	x		x		x												
Mario Fiorucci		x			x							x										
Paula Shultz	x	x			x	x																

- *Applicant's Response: At the May 1, 2006, Public Hearing, the applicant announced a major modification to the project as a result of the initial responses received. This revision was formalized in a revised permit submission, received by the Corps on August 17, 2006. This modification proposed that the inflatable structure would no longer incorporate a vertical slot fish passage facility, but would incorporate 'operational flexibility' Therefore, the applicant's response to individuals and organization are addressed and summarized under the resource agency comments (Item #7 of this EA) for PN #06-51.*
- *Corps Response: Regarding the comment on the need for Congressional approval of Section 9 of the Rivers & Harbors Act, the Corps has determined that the Wilkes-Barre Inflatable Structure is a weir and not a 'dam' thus Section 9 authorization (Congressional approval) is not required for this proposed project (USACE, 06 July, 2004). (Section 9 of the River and Harbor Act of 1899 prohibits the construction of any dam or dike across any navigable water of the United States in the absence of Congressional consent and approval of plans by the Chief of Engineers and the Secretary of the Army). The Corps acknowledges that tax payers would bear the burden of the construction and maintenance of the proposed project. It is not the role of the Corps to make a judgment of whether the proposed project violates Article 1, Section 27 of the Pennsylvania Constitution. The Corps has considered and addressed the remainder of these comments in Public Interest Review Factors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 20, and 21.*

PN # 06-52: In response to the second public notice, which advertized an inflatable structure with 'operational flexibility' to address fish passage and other environmental concerns, dated October 4, 2006, the Corps received no comments of support from individuals or organizations, comments of opposition from ten (10) individuals and four (4) organizations, an e-mail petition with four hundred and forty-four (444) signatures opposing the project, and seven (7) requests for another public hearing. The comments of opposition had ten (10) main issues that were identified. The issues, in order of frequency mentioned, are as follows:

<u>Issue</u>	<u>Individuals & Organizations</u> (Includes 444 from the e-mail petition)
1. Water Quality	454
2. Impacts on fisheries	453
3. Impounding a free-flowing river	449
4. The burden on the taxpayers/maintenance costs	449
5. Human health concerns	448
6. Safety	448
7. Affects on current recreational users	2
8. Lack of information provided by applicant	2
9. Wetlands	1
10. Wildlife	1

Table A-5 identifies the comments and issues opponents of the project made in response to PN # 06-52. There were no comments in support of the project in response to this public notice.

Table A-5. Comments/Issues from Individuals & Organizations Opposed to the Proposed Project (Public Hearing)										
Commenter	1	2	3	4	5	6	7	8	9	10
American Rivers	x			x	x	x		x		
Greater Wyoming Valley Audubon Society								x		
Suskie Bassmasters	x	x				x	x			x
Blue Mountain Outfitters	x	x				x			x	
Donald Williams	x	x					x			
Brian Mangan		x		x						
J. Capozzelli	x	x		x		x				
John Montague	x				x					
Bill Cannon			x	x						
Karl Shellenberger	x	x	x		x					
Dan & Karen Natt	x	x	x	x						
David Cannon	x	x			x					
Mary Ann Keller	x	x	x							
Nancy Shukaitis			x							
E-mail petition	x	x	x	x	x	x				

- *Applicant’s Response: The applicant addressed these comments under the resource agency comments (Item #7 of this EA) for PN # 06-51.*
- *Corps Response: The Corps acknowledges that tax payers would bear the burden of the construction and maintenance of the project. The Corps has considered and addressed the remainder of these comments in Public Interest Review Factors 1, 2, 3, 4, 5, 7, 11, 13, 15, and 17.*

In a letter dated April 26, 2007, the Corps sent responses to the six individuals and one organization requesting a public hearing. This letter stated that the Corps would not hold a 2nd public hearing but would continue to welcome all relevant public input and comment relating to this proposed project. Three additional letters were received; one from the Greater Wyoming Valley Audubon Society; one from American Rivers; and one from the Onondaga Nation. No additional issues were raised from letters received from the Greater Wyoming Valley Audubon Society. The Corps responded to the Onondaga Nation letter under the resource agency comment section in the main text of this document.

APPENDIX B

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