

Susquehanna River Basin Commission

a water management agency serving the Susquehanna River Watershed



December 3, 2014

Ms. Lisa Kiefel
Planning Portfolio Manager
U.S. Army Corps of Engineers
Attn: CECW-CE
441 G Street NW
Washington, DC 20314-1000

Dear Ms. Kiefel:

The Water Resources Reform and Development Act (WRRDA) of 2014, Section 7001 requires that the U.S. Army Corps of Engineers (USACE) publish a notice in the Federal Register to request proposals from non-federal interests for feasibility studies and modifications to authorized USACE water resources development projects or feasibility studies. Proposals must be submitted by December 3, 2014 in order to be considered for inclusion in the Annual Report to be issued in February 2015. Accordingly, the Susquehanna River Basin Commission (SRBC) is pleased to submit this proposal for modifications to the authorized Tioga-Hammond Lakes project in Tioga County, Pennsylvania. The USACE Baltimore District owns and operates the project.

Project Background

The Tioga-Hammond Lakes project was authorized by the Flood Control Act of July 3, 1958 (Public Law 85-500, 85th Congress). Project construction was initiated in September 1971 and was operationally completed for water control purposes in November 1978. The cost of the project was \$185,700,000. The project consists primarily of two separate dams: one on Tioga River and one on Crooked Creek. The two dams are located approximately two miles upstream of the confluence of the Tioga River and Crooked Creek. The lakes are joined by a gated connecting channel in a saddle of the ridge separating the two streams. An uncontrolled spillway in Hammond Dam serves both reservoirs. A gated outlet conduit is provided in the left abutment of Tioga Dam for the control of flows for both reservoirs. Tioga Dam controls 280 square miles of drainage area in the Tioga River basin, while Hammond Dam controls 122 square miles of drainage area in the Crooked Creek basin.

The primary purpose of the Tioga-Hammond Lakes project is to provide flood damage reduction for communities along the Tioga, Chemung, and Susquehanna Rivers. Secondary purposes include water quality control and recreation. During high water situations, releases from Tioga-Hammond Lakes are limited, reduced, or completely eliminated based on downstream river stages. Excess inflows to the reservoirs are then stored for release at a later time when downstream river stages have receded. When flooding is not likely, the lake levels are generally maintained at their conservation pools to retain full flood control capacity. The lakes at conservation pool elevations are managed to furnish in-lake and shoreline recreational

opportunities and to improve in-lake and downstream water quality conditions through blending of the two sources. The connecting channel, weir, and Hammond outlet works are a unique system providing a means to discharge alkaline Hammond water directly into Tioga Lake. The discharge usually occurs at a controlled rate, helping to buffer the acidic water in Tioga Lake and to improve the quality of Tioga Lake's outflow. The Tioga outlet tower has a multi-level withdrawal system that, when the lake is stratified, enables water of various qualities from different levels to be blended to satisfy outflow objectives. The Crooked Creek outlet works provide flow for maintaining aquatic habitat in Crooked Creek below Hammond Dam and releases of alkaline Hammond Lake water for later mixing with acidic Tioga releases downstream of the Tioga-Crooked Creek confluence.

Minimum desired flow targets have been established downstream of both Tioga and Hammond Dams. The primary objective is to provide adequate flow for downstream fish habitat. The minimum desired flow through the Tioga outlet works is 35 cubic feet per second (cfs). Inflow to Tioga Lake occasionally drops below 35 cfs during low flow periods. Under these conditions, storage in Tioga Lake may be used to satisfy the downstream flow target. The minimum desired flow through the Crooked Creek outlet works is 5 cfs, although it is customary to release about 10 cfs under most conditions. If the combined outflow from Hammond Lake exceeds inflow, then storage in Hammond Lake may be used to satisfy the outflow requirements. During extremely low flow conditions, Tioga-Hammond Lakes may be regulated in accordance with the Drought Management Plan and occasional drawdowns may occur.

Proposed Project Modifications

SRBC believes the Tioga-Hammond Lakes project can be modified to improve the quality of aquatic habitat and the environment, both in-lake and in the downstream ecosystem. As long as the 5-foot head differential between lakes is maintained, relatively equal changes in storage for both Tioga and Hammond Lakes should not be constrained. It is understood that there are no significant dam safety issues present, and the 6 inches of flood control run-off capability is at the upper end of projects in the basin. It is believed that raising the Tioga pool may be beneficial to recreation and raising the Hammond pool can be accommodated with some improvements, including recreation enhancements. The in-lake ecosystem would also benefit from enhancements to aquatic habitat, including installation of habitat structures, and related environmental modifications.

The Susquehanna River Basin Ecological Flow Management Study (EFMS) Phase I Report, prepared cooperatively by USACE, SRBC, and The Nature Conservancy (TNC), presents a set of flow standards that support ecosystem health and application strategies to preserve and restore such flows, including modifications at USACE reservoirs. The EFMS Phase II Project Management Plan (PMP), prepared jointly by USACE and SRBC, includes an initial examination of seven USACE reservoirs for flood storage reallocation or operational changes. The findings indicated that the Tioga-Hammond Lakes project is worthy of examination for both flood storage reallocation and operational changes to meet ecological flow management objectives.

The construction and operation of the Tioga-Hammond Lakes project has resulted in noticeable improvements in water quality, particularly downstream of Tioga Dam. In recent years, state and local organizations have initiated numerous efforts to reclaim abandoned coal mines and associated discharges upstream of Tioga Dam. SRBC has been actively engaged in this effort by developing a Watershed Assessment and Remediation Strategy for Abandoned Mine Drainage in the Upper Tioga River Watershed, conducting ongoing water quality monitoring, and partnering on various mine drainage treatment projects in the watershed. These efforts have collectively resulted in measurable improvements in water quality upstream of the project and restoration of viable fish and other aquatic communities in Tioga and Hammond Lakes and the Tioga River downstream of the project. The water quality improvements may alleviate or lessen the need for water quality driven operations at the project, which would present opportunities for modifications that place a greater emphasis on low flow management and habitat improvement objectives.

In summary, SRBC believes that modifications to the project that result in (1) operations that provide flow augmentation during critical low flow periods, (2) modified conservation releases that are better aligned with the newly established EFMS flow standards, or (3) reallocation of flood storage to water supply storage, combined with associated environmental and recreational enhancements, would benefit in-lake resources and instream flow needs and aquatic habitat downstream of the project.

Proposal Criteria and Supplementary Information

The proposed modifications described above are (1) related to USACE's ecosystem restoration core mission, (2) required to have specific congressional authorization, (3) not previously congressionally authorized, (4) not included in a previous annual report, and (5) able to be carried out by USACE, if authorized under Section 7001. Also, in accordance with the August 5, 2014 Federal Register Notice, the following supplemental information has been included in this proposal:

1. Non-federal sponsor: SRBC
2. Proposal type: modification to an authorized USACE project
3. Project purpose: improve the quality of aquatic habitat and the environment, both in-lake and in the downstream ecosystem
4. Estimated cost: ranges from \$5,000,000 (modified low flow operations and associated environmental/recreational enhancements) to \$50,000,000 (flood storage reallocation and associated environmental/recreational enhancements), depending on type of modifications implemented
5. Anticipated monetary and non-monetary benefits:
 - a. monetary benefits to the local economy from increased recreational opportunities, both in-lake and downstream;

- b. non-monetary benefits to the environment from water quality treatment, recreational enhancements, aquatic habitat enhancements, and ecosystem/low flow management releases; and
 - c. monetary and non-monetary benefits to downstream water users, which have implications to public health and safety and economic development, from low flow/drought management releases.
6. Local support: anticipated from elected officials, federal/state/local resource agencies, local watershed/conservation groups, non-governmental organizations, local universities/colleges, etc.
 7. Sponsor cost share capability: SRBC has the financial ability to provide for the required cost share, which is initially understood to be 50% of the cost for studies (cash and/or in-kind services) and 35% for construction
 8. Sponsor letter of support: this proposal serves as SRBC's letter of support

Thank you in advance for your consideration of this proposal in accordance with Section 7001 of the WRRDA of 2014. We look forward to the opportunity to work with USACE on these proposed modifications to the Tioga-Hammond Lakes project.

Sincerely,



Andrew D. Dehoff
Executive Director

cc: Amy Guise, Baltimore District, Chief, Planning Division
Daniel Bierly, Baltimore District, Chief, Civil Project Development Branch