

## **1.0 Introduction**

The South Carolina Department of Transportation (SCDOT) has proposed the construction of Berlin Myers Parkway (BMP) Phase 3 (the Proposed Project) in Dorchester County, South Carolina. Phase 3 of the parkway will complete the Berlin Myers Parkway project, a roadway facility planned to provide an alternative route around the Town of Summerville. Planning for the Berlin Myers Parkway Project corridor originally began in the 1970's with construction of Phases 1 and 2 of the project completed in 1998. The existing portion of Berlin Myers Parkway is designated as SC Route 165 and extends from the intersection with US-17A near I-26 to an at-grade intersection with East Carolina Avenue.

Most of the new roadway alignment is located adjacent to the Sawmill Branch (the Branch) and the roadway design includes multiple bridges and other stormwater features to facilitate flow to and along the Branch. The Sawmill Branch is a Section 205 Minor Flood Control Project constructed by the United States Corps of Engineers (USACE) in the late 1960's to alleviate flood concerns in the Town of Summerville. As a federally authorized civil works project (the Existing Federal Project), it is under the jurisdiction of the USACE. As such, any physical modifications to the Branch or associated floodplain which may impact the performance of the flood control project are subject to the requirements of a Section 408 review. The Section 408 policy (33 USC 408) authorizes the USACE to authorize alterations / modifications to existing USACE flood control projects.

The construction of the Proposed Project will impact certain features of the existing Federal Project. To avoid impacts to the authorized purpose of the existing Federal Project, a number of features have been incorporated into the design of the Proposed Project in the area adjacent to the Federal Project to address any potential impacts to the public and the function of the branch. A Section 408 Review Package was submitted to USACE in accordance with 33 USC 408 (Section 408) to demonstrate that the construction of the Proposed Project and associated alterations to Sawmill Branch are not injurious to the public interest and do not adversely affect the ability of the Sawmill Branch to meet its authorized purpose.

Sawmill Branch and the associated floodplain is also designated by FEMA as a Special Flood Hazard Area Zone AE. The impacts of the proposed project were also evaluated for compliance with all FEMA requirements associated with the Nation Flood Insurance Program.

### **1.1 Technical Evaluation**

A rigorous process was undertaken during the project development to evaluate mitigation strategies for implementation with the construction of Berlin Myers Parkway Phase 3. The goal of these strategies was to allow for construction of the Proposed Project while simultaneously maintaining the function of the existing Federal Project, maintaining compliance with FEMA criteria, and minimizing negative impacts to the public and the environment. These extensive analyses and design efforts during the project development have culminated in a Proposed Project that maintains the existing Federal Project's purpose and need; avoids unacceptable impacts to the public and the environment; and satisfies the requirements of USACE and FEMA.

In addition to the extensive hydrologic and hydraulic analyses that have been performed to evaluate the overall floodplain function and performance, the development and assessment of mitigation strategies was conducted and implementation into the Proposed Project. The following is a summary of the mitigation strategies and design components.

**Stormwater / Surface Water Design and Analysis** – Verification of proposed cross line drainage structures and internal roadway drainage systems for adequate conveyance of stormwater during more localized rainfall events.

**Bridge / Structure Design** – Evaluation of bridge structures and development of span arrangements and structure types for inclusion in the hydraulic models to appropriately represent the bridges in the analysis.

**Geotechnical Design** – Evaluation of the roadway embankment for stability, settlement, and seepage to verify the performance of the embankments since they are an integral part of the hydraulic models and a driver in hydraulic performance.

**Construction Sequencing and Phasing** – Identification of a construction sequence that will allow for efficient construction while mitigating potential flood-related risks that could arise during construction if not addressed with proper sequencing.

**Operations and Maintenance** – Identification of key operations and maintenance provisions that will need to be added to the existing operations and maintenance plan as a result of the Proposed Project.

The technical evaluation of the project that has been undertaken and summarized above as well as the evaluation of other key components of the effects and implementation of the Proposed Project have been conducted and are summarized in this document. These evaluations demonstrate that sound engineering analyses were performed in order to demonstrate the minimal impacts of the Proposed Project relative to the function of the Federal Project and the overall public interest.

## 1.2 Objectives of Section 408 Review

Section 408 (33 USC 408) requires that USACE must evaluate any proposed alterations to a USACE flood control project to ensure that they will not be injurious to the public interest and will not affect the USACE project's ability to meet its authorized purpose. Below is a summary of how these two primary objectives are accomplished by the Proposed Project.

### 1.2.1 Ability of Federal Project to Meet Authorized Purpose

The Sawmill Branch Improvements that were made as part of the Federal Project were intended to allow for the channel to contain the 5-year storm. The impact of the Proposed Project on the conveyance of the original design storm has been evaluated from two different perspectives: by measuring flows in the hydraulic models and through the Flood Damage Assessment (FDA) evaluation.

The hydraulic models were used to evaluate the five-year storm conveyance in order to verify sufficient real estate interests remain in place to provide appropriate authority to maintain the intended functionality of the Federal Project. This study involved comparing the conveyance within the right-of-way / easement areas in both the existing and proposed conditions and it was found that there is no meaningful change in overall conveyance of the 5-year storm and that more of the flow is conveyed within the right of way / easement area in the proposed condition.

An additional evaluation of the Federal Project's containment of a variety of storms (relative to preventing damage) can be made by examining the conditional non-exceedance probability (CNP) that is an output of the FDA evaluation. The FDA was performed in conjunction with the Proposed Project. The CNP demonstrates how effectively the project contains floodwaters and prevents damage for various return periods. A review of the CNP comparison between the existing and proposed conditions across all of the evaluated reaches shows that the Federal Project's effectiveness in preventing flood damage for the 25-year storm and below is virtually unchanged across all of the evaluated reaches and in some cases improved by construction of the Proposed Project.

Even when looking beyond the intended purpose of the Federal Project and considering storms up to a 500-year return period, the existing Sawmill Branch will still provide for the conveyance of these extreme event floodwaters after construction of the Proposed Project with increases in water surface elevations (WSEs) which are relatively small and minimally impactful.

### 1.2.2 Impacts to the Public Interest

The primary negative impact to the public interest relates to a potential increase in the risk of flood damage as a result of the Proposed Project. This risk has been evaluated both qualitatively and quantitatively within the project limits, upstream of the project, and downstream of the project. The hydraulic analysis performed for the Section 408 review indicates that the Proposed Project generally causes an increase in flood elevations in the area downstream of the project; these areas are typically wooded, wetland areas currently owned by Dorchester County. While these increases are over one foot in some areas, in the areas where structures are located, the increase in elevation is generally less than 0.1 feet. This minor amount of increase in WSE results in a rather insignificant and incremental amount of damage; that is to say that the structures impacted by the increase would likely experience damage in the existing conditions and the slight increase in water level represents a small, rather indistinguishable amount of additional damage.

## 2.0 FEMA

The evaluation of the impacts of the Proposed Project relative to FEMA analysis methods and performance criteria demonstrates that the FEMA 100-year floodplain boundaries and base flood elevations will not change. Therefore, no additional properties will be subjected to FEMA flood

insurance requirements as a result of the Proposed Project. Avoidance of this impact to the public is very meaningful since adding properties to the FEMA 100-year floodplain that were not previously included would represent a true financial burden on those property owners which occur in perpetuity in the form of annual insurance premiums and reduced property values.

### **3.0 Conclusion**

The detailed analysis indicated the proposed project would result in changes to the WSEs associated with various storm frequencies from the 2-year storm to the 500-year storm. In general, these changes are minimal. Immediately adjacent to the proposed project, the WSEs are generally lower with a few localized areas in which there are increases in WSEs. As shown on Figure 1, the proposed project causes slight increases in the 25-year WSE upstream and downstream of the project area. The increases in WSEs within the area of the proposed project limits are located in undeveloped areas or areas where no structures would be affected.

