

*Agency Official 106 Effect Report*

*Stabilize Hazel Run and Protect Fredericksburg City Sewer Line Manhole*

**U.S. Department of the Interior  
National Park Service  
Fredericksburg & Spotsylvania County Battlefields Memorial National Military Park  
120 Chatham Lane  
Fredericksburg, Virginia 22405**

## **Purpose**

Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park was authorized by an act of Congress on February 14, 1927 (44 Stat. 1091). The purpose of the park, as stated in the act, is “to commemorate the Civil War battles of Fredericksburg, Spotsylvania Court House, Wilderness, and Chancellorsville, including Salem Church...and to mark and preserve for historical purposes the breastworks, earthworks, gun emplacements, walls, or other defenses or shelters used by the armies on the said battles...and together also with additional land as the Secretary of War may deem necessary for monuments, markers, tablets, roads, highways, paths, approaches, and to carry out the general purposes of this Act.” The legislation further states that the park shall “...open, construct, and repair such roads, highways, paths, and other approaches as may be necessary to make the historical points accessible to the public and to the students of said battles...” By Executive Order 6166 in 1933 the park was transferred to the Department of the Interior to be administered by the National Park Service.

The stated mission of the National Park Service is: The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

## **Need**

Hazel Run, which runs along the boundary of the National Park Service lands at the Fredericksburg Battlefield and west of the Fredericksburg National Cemetery, is changing course and causing significant erosion to the left bank of the stream. As a result, an existing underground city sewer line is now exposed. A manhole access that was once situated in the bank is now exposed in the stream. Without intervention, continued erosion is likely to occur, thus putting the sewer line at great risk for destabilization, damage and possible destruction. Also, additional erosion could affect park lands to the east, lands that contain historic and significant archaeological resources. In order to protect the existing sewer line and arrest erosion, the park is proposing to allow the city of Fredericksburg to stabilize the left bank of Hazel Run and install measures to divert the course of the stream back toward the middle of the stream’s channel.

## **Description**

The park proposes to allow the City of Fredericksburg to rehabilitate Hazel Run to arrest erosion and to protect the sewer line. This will involve stabilizing the left bank of the stream with the

installation of stone gabions and rock toe revetment, as well as the installation of log vanes and steel deflection shield at the upstream point at which the current begins to hit the left bank. The gabions and toe revetment will help arrest erosion and stabilize the bank, while the shield and log vanes will act to deflect the current back toward the center of the stream channel.

## **Property Description**

### **A. Major Physical Components**

1. Fredericksburg Battlefield – The area of the proposed project lies within Hazel Run, a stream that runs along the western edge of the Marye’s Heights and Sunken Road corridor of the Fredericksburg Battlefield. The project area is bounded by NPS lands to the east and north, specifically the Fredericksburg National Cemetery, private lands to the west and Lafayette Boulevard (Business US Route 1) to the south. The site is not accessible to the public and the park has no plans to make it accessible.

### **B. Historical Significance**

1. Fredericksburg Battlefield – The area was directly behind the Confederate front lines during the December 1862 Battle of Fredericksburg. During the May 1863 Second Battle of Fredericksburg, Union troops attacked across this ground as they surged north across Hazel Run and up over Marye’s Heights. Directly east from the run is the Willis Hill Road Trace, which during the two battles served as a route of transportation for supplies for the Confederate defenders.

### **C. Archaeological Resources**

1. Fredericksburg Battlefield – Archaeological surveys in the immediate vicinity of Hazel Run have resulted in two listed site – 44SP0053 and 44SP0411. The first site (44SP0053) includes a nineteenth-century mill, dam, and mill raceway, while the second (44SP0411) includes the site of a stone quarry. The resources associated with the mill (44SP0053) site are on or near the stream bank and continued erosion could threaten them.

### **D. Historic Landscape Resources**

1. Fredericksburg Battlefield – Hazel Run is a natural watercourse that is part of the Fredericksburg Battlefield. The stream and its banks are part of the battlefield landscape.

## **Description of Alternatives**

### **Alternative A – No Action**

Under this action, no efforts to rehabilitate the stream will occur and the left bank will continue to erode and the sewer line will be put at greater risk of destabilization and potential destruction, leading to a spillage of the sewer into the stream.

### **Alternative B – Stabilize Hazel Run with Gabion Baskets (Concept One)**

Under this action, approximately 180 feet of the left bank of Hazel Run would be stabilized through the use of gabion baskets filled with stone. Each basket would be 3 feet by 3 feet by six feet and would be positioned along the eroded left bank of the stream. Behind the baskets, imported clean fill would be brought in to re-establish the stream bank and integrate it into the gabion baskets. Three gabion baskets filled with stone, each measuring 3 feet by 3 feet by six feet, would be positioned around the exposed manhole to protect it. While this alternative would protect the sewer line and rehabilitate the stream bank, it would not deflect and redirect the current of the stream, thus bank erosion would return and continue in the future.

### **Alternative C – Stabilize Hazel Run with Shotcrete and Gabion Baskets (Concept Two)**

Under this action, the 120 feet of the left bank of Hazel Run would be stabilized through the use of Shotcrete, a liquid concrete sprayed through a hose onto the river bank. The result, once dry and cured, would be a concrete wall that was 120 feet in length and 15 feet in height. Three gabion baskets filled with stone, each measuring 3 feet by 3 feet by six feet, would be positioned around the exposed manhole to protect it. While this would effectively stabilize the stream bank and protect the sewer manhole, maintenance of the shotcrete wall could become problematic in years to come. Deterioration and eventual breaking down of the concrete could lead to distribution of concrete rubble in the stream.

### **Alternative D – Relocation of the Sewer Line (Concept Three)**

Under this action, the sewer line would be rerouted to the right bank of Hazel Run and the existing sewer line would be abandoned. While this would solve the problem of risk to the sewer line, it would require new excavation through the stream and through potentially undisturbed land on the right bank. Additionally, it would not solve the problem of stream erosion on the left bank of Hazel Run.

### **Alternative E – Stabilize Hazel Run with Combination of Rock Toe Revetment, Gabion Baskets and Steel Sheet Pile (Preferred Alternative)**

Under this action, stabilization of the left bank of Hazel Run would occur utilizing a combination of erosion control techniques. At the farthest upstream point of the project area a 20 feet x 10 feet steel sheet pile and rock wing deflector would be driven into the river bed and angled along the left bank. This steel sheet would work to deflect the stream current and energy back into the

center of the stream and away from the left bank. For 180 feet downstream from the deflector, rock toe revetment would be installed along the stream bank. For 72 feet of the farthest downstream bank, where the erosion has accelerated, the rock toe revetment would be reinforced with twelve 3 feet by 3 feet by 6 feet stone filled gabions would be installed along the embankment and around the exposed manhole. Clean fill would be brought in to backfill behind the gabions and the eroded stream bank. Two log vanes would be installed in the stream bed at locations upstream from the gabions. These log vanes would be anchored into the stream bank and will help to further deflect the current into the channel. The stone used for the rock revetment and gabions would be native stone and over time would blend into the natural environment.

### **Park Consultation**

The proposal is being circulated to the park's Section-106 advisors for archaeology and historic landscape architecture.

The proposal is going through a 30-day public comment and review period. During this time, the project was posted on the National Park Service Planning, Environmental, and Public Comment System (PEPC) website. The park has contacted, and solicited comments from, representatives of interested organizations such as the University of Mary Washington's Department of Historic Preservation, the Friend of the Fredericksburg Area Battlefields, the Central Virginia Battlefields Trust, the City of Fredericksburg, the Pamunkey Indian Tribe, and the United States Army Corps of Engineers.

The proposal has been sent to the State Historic Preservation Office (Virginia Department of Historic Resources) for a 30-day review.

The proposal is going through a review under the National Environmental Policy Act (NEPA).

The City of Fredericksburg is coordinating with the United States Army Corps of Engineers, the Virginia Marine Resources Commission and the Virginia Department of Environmental Quality to obtain the appropriate permits.

### **Effect Analysis**

The park's opinion is that Alternative E will have "no adverse effect" on historic landscape or archaeological resources and would help to protect historic resources on NPS lands.

**Report Prepared By**

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