



Rehabilitation of the  
**Lincoln Memorial Reflecting Pool**  
and surrounding area

ENVIRONMENTAL ASSESSMENT



December 2009

Rehabilitation of the

# Lincoln Memorial Reflecting Pool

and surrounding area

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December 2009 **NATIONAL MALL AND MEMORIAL PARKS**

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# PROJECT SUMMARY

The National Park Service (NPS) has prepared an Environmental Assessment (EA) to evaluate impacts of two alternatives for the rehabilitation of the Lincoln Memorial Reflecting Pool and surrounding area located on the National Mall in Washington, D.C.

The project area is one of the most popular destinations in the country, having served as the backdrop to some of our nation's most historic events. The monuments, memorials, landscape features, and vistas within the project area constitute some of the most iconic and recognizable images commemorating presidential legacies and war veterans in the country, resulting in millions of annual visitors. Nevertheless, the project area is being used far beyond the capacity for which it was originally designed, and the physical condition of the infrastructure and circulation systems have deteriorated to the level of creating inefficiencies in park management and operations. In addition, several components need to be upgraded to address issues that were not anticipated in the original planning and design of the project area, such as security, accessibility, and nighttime visitation. Action is needed at this time to address structural deficiencies in the Reflecting Pool and to enhance the infrastructure, safety, and pedestrian circulation systems in the surrounding area.

This EA presents two alternatives (the no action alternative and the action alternative with several options) for multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources in three locations in the project area: the elm walks, Lincoln Memorial east plaza, and the Reflecting Pool. At the Reflecting Pool, upgrades are proposed to improve its functionality and sustainability and to formalize walkways along the worn dirt paths created by visitors traveling between the World War II Memorial and the Lincoln Memorial. To the north and south of the Reflecting Pool along the historic elm walks, the site furnishings would be refurbished and reconfigured and the walkways would be resurfaced to enhance public safety and visitor experience. To the west end of the elm walks, improvements are proposed to integrate accessible pathways between the Reflecting Pool and Lincoln Memorial east plaza with a permanent vehicular security system to replace the temporary concrete barriers that were installed in 2008 in the center section of the east plaza.

The action alternative is the NPS Preferred Alternative (Options A3, B2.1, and C1) and the implementation thereof would result in long-term beneficial impacts to visitor use, public safety, park management and operations, soils, and vegetation. There would be long-term minor to moderate adverse impacts to cultural and visual resources and water resources in the project area. There would be no long-term effects on floodplains and transportation and no impairment to any of the above-mentioned resources as a result of implementing any of the options of the Preferred Alternative.

This document is being used for compliance with both the National Environmental Policy Act (NEPA) of 1969, as amended and the National Historic Preservation Act of 1966, as amended.

## **Note to Reviewers and Respondents:**

To comment on this EA, you may mail comments or submit them online at <http://parkplanning.nps.gov/NAMA> and follow the appropriate links. Please be aware that your comments and personal identifying information may be made publicly available at any time. While you may request that NPS withhold your personal information, we cannot guarantee that we will be able to do so. Please mail comments to:

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RE: Rehabilitation of the Reflecting Pool EA

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# CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

## Introduction

As part of the 2009 American Recovery and Reinvestment Act (Recovery Act), the National Park Service (NPS) has prepared this Environmental Assessment (EA) to evaluate a range of alternatives for the rehabilitation of the Lincoln Memorial Reflecting Pool (Reflecting Pool) and surrounding area located on the National Mall in Washington, D.C.

This EA presents two alternatives for multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations around the Reflecting Pool. At the Reflecting Pool, upgrades are proposed to improve its functionality and sustainability and to formalize walkways along the worn dirt paths created by approximately 4.5 million<sup>1</sup> annual visitors traveling between the World War II Memorial and the Lincoln Memorial. To the north and south of the Reflecting Pool along the historic elm walks, the site furnishings would be refurbished and reconfigured and the walkways would be resurfaced to enhance public safety and visitor experience. To the west end of the elm walks, improvements are proposed that would integrate accessible pathways between the Reflecting Pool and Lincoln Memorial east plaza with a permanent vehicular security system to replace the temporary concrete barriers that were installed in 2008 in the center section of the east plaza.

The proposed improvements are analyzed in one action alternative with numerous options for specific variations at different locations in the project area.

## Purpose of and Need for Action

The purpose of the proposed actions is to improve and enhance visitor experience, the efficiency of Park management and operations, and the functionality and sustainability of certain elements at the Reflecting Pool and surrounding area in a manner that respects the historic resources of the Lincoln Memorial cultural landscape and the context of the National Mall. In the past 90 years since its construction, the project area has served as the backdrop to some of the country's most historic events, such as Marian Anderson's concert in 1939, Dr. Martin Luther King, Jr.'s "I Have a Dream Speech" in 1963, the memorial service for President John F. Kennedy in 1963, and the anti-Vietnam War rally in 1967. Most recently in January 2009, the project area and other parts of the National Mall hosted the largest Presidential Inauguration in history, which introduced an unprecedented amount of visitors to the area (see Figure 1.1).

Figure 1.1 – Historical Images of the Project Area



<sup>1</sup> There are approximately 4.5 million annual visitors who travel between the World War II and Lincoln Memorials. However, in 2008, the combined visitation between the World War II, FDR, Korean Veterans, Vietnam Veterans, and Lincoln Memorials was 15,110,392 (Weltzin 2009).

Action is needed at this time to address substantial repairs and structural deficiencies at the Reflecting Pool. Engineering analysis has shown that differential soil settlement has compromised its structural system. The stress on the foundation, joints, and coping has caused pervasive water leakage, which along with evaporation, constitutes a substantial loss of water. This net loss represents a tremendous inefficiency since the NPS uses the water from a municipal source, the D.C. Water and Sewer Authority (DC WASA). As a result, the NPS needs to improve the efficiency of the system by creating a more cost-effective and sustainable method to fill and discharge the Reflecting Pool while at the same time improving the quality and appearance of the water.

Improvements to the pedestrian circulation systems are needed to enhance public safety, to provide universal accessibility, to provide permanent physical security, and to restore and protect historic resources. Due to the volume of visitation in the project area, the walkway surfaces and site furnishings (benches and trash receptacles) suffer from overuse. Along the north and south sides of the Reflecting Pool, the worn dirt paths are uneven and irregular and in need of a more uniform walking surface. Along the length of the elm walks, several improvements are needed: the pavement is deteriorating and needs to be rehabilitated, the site furnishings need to be reconfigured to better accommodate visitors, permanent lighting needs to be installed to enhance nighttime use, and the western termini need to be upgraded for accessibility. Also at the west end, the walls, stairs, and landings that connect the Lincoln Memorial east plaza and the Reflecting Pool (collectively known as the 'lower approachway') are deteriorating, yielding inadequate pedestrian circulation and maintenance access. At the top of the lower approachway, in the center section of the Lincoln Memorial east plaza, a permanent vehicle security barrier system is needed to replace the temporary concrete barriers which are inconsistent with the historic character of the project area.

The monuments, memorials, landscape features, and vistas within the project area constitute some of the most iconic and recognizable images commemorating presidential legacies and war veterans in the country, resulting in millions of annual visitors. Nevertheless, the project area is being used far beyond the capacity for which it was originally designed, and the physical condition of the infrastructure and pedestrian circulation systems has deteriorated to a level that is creating inefficiencies in Park management and operations. In addition, several components need to be upgraded to address issues that were not anticipated in the original planning and design of the project area such as security, accessibility, and nighttime visitation.

## Objectives

Objectives are “what must be achieved to a large degree for the action to be considered a success” (NPS *Director’s Order 12 [DO-12]*) and represent more specific statements of purpose and need. All alternatives selected for detailed analysis must meet all objectives to a large degree and must resolve the purpose of and need for action. The following objectives were identified by the planning team for this project:

- Rehabilitate the cultural landscape associated with the project area in a manner that respects the resources and values of the NPS and the National Mall.
- Implement improvements to the architectural features, structures, and systems in the project area that improve their efficiency and maintain their consistency with the historic character of the project area.
- Enhance the pedestrian circulation systems in the project area to ensure their accessibility and responsiveness to historic vistas.
- Provide for the security of visitors and staff at the Lincoln Memorial in a manner that is consistent with the historic and visual character of the surrounding project area.
- Avoid or minimize adverse impacts on the cultural landscapes, historic structures, and other cultural resources of the National Mall and the project area.
- Avoid or minimize adverse impacts on the viewsheds and the visual quality of the project area.
- Implement improvements that maximize Park efficiency, operations, and maintenance.
- Provide permanent physical security to the project area.

## Project Location

The proposed actions are located primarily on the Lincoln Memorial Grounds in the area that includes and immediately surrounds the Lincoln Memorial Reflecting Pool. Some proposed actions will affect a larger area of impact including portions of West Potomac Park between the east edge of Lincoln Memorial Circle and Ohio Drive SW and West Basin Drive SW to the south. The project location is delineated in Figure 1.2.

The Area of Potential Effect (APE)<sup>2</sup> for cultural resources does vary from the general project area and is shown on the inset of Figure 1.1 and further described in the “Cultural Resources” section of Chapter 3.

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<sup>2</sup> According to 36 CFR 800.16(d), the Area of Potential Effect is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

Figure 1.2 – Lincoln Memorial Reflecting Pool Project Area



## Project Background

The Lincoln Memorial was dedicated in 1922; the Reflecting Pool was completed two years later. Both elements were part of a formal landscape envisioned in the 1902 McMillan Plan for the city. The McMillan Plan foresaw a highly symbolic use for the project area, extending the central axis of the Mall to the Potomac River using a public memorial and public park.

The project area is one of the important axes in the nation, one that aligns several key national symbols including the U.S. Capitol Building, the Washington Monument, the World War II Memorial, and the Lincoln Memorial. These features were designed to connect by landscape features common to formal French gardens, such as manicured open lawns, walkways lined with trees, and long, shallow reflecting pools.

Since 1902, the project area has undergone several subsequent periods of planning, design, and restoration, but the most salient landscape elements that represent the fundamental intent of the original plan have remained mostly unchanged, such as the historic elm walks, the Reflecting Pool, the Lincoln Memorial Circle, and the lower approachway. Today, nearly a century later, multiple upgrades and repairs are needed to rehabilitate elements within the project area which suffer from the effects of time and overuse and which are approaching the end of their useful life. Table 1.1 delineates a timeline for improvements and repairs within the project area since the 1920s.

Table 1.1 – Project Background

1922	The Lincoln Memorial is dedicated.
1924	The Reflecting Pool is completed.
1929	The Reflecting Pool receives a reinforced concrete slab foundation due to differential soil settlement.
1935-1936	Drainage trenches along the elm walks are installed.
1945-1970	The Lincoln Memorial steps (upper approachway) and the lower approachway are increasingly used for public ceremonies, events, and first amendment demonstrations.
1970s	In preparation for the Bicentennial celebration, improvements to several areas around the Lincoln Memorial are planned.
1972	The eastern portion of Lincoln Memorial Circle is closed to vehicular traffic for pedestrian safety.
1973-1974	The information kiosks to the east of the Lincoln Memorial are open; paving is added at the base of the Reflecting Pool steps to the pool; elm walks are repaved with a bituminous paving rather than concrete.
1978	The Reflecting Pool is now cleaned twice annually with 10 to 15 large truckloads of debris removed at each cleaning.
1981	A full Reflecting Pool reconstruction addresses water leakage, intake, and drainage. Self-sustaining methods to maintain the appearance of and to clean the pool are introduced.
1986	An engineering report reveals that the Reflecting Pool structural system is failing.
2001	Jersey barriers are placed around the Lincoln Memorial.
2008	Installation of a permanent vehicle security barrier around the Lincoln Memorial is completed, with the exception of temporary concrete barriers placed on the east side

## Purpose and Significance of the National Mall and Memorial Parks

### ESTABLISHMENT

In 1924, Public Law 202 established the National Capital Park Commission (renamed to the National Capital Planning Commission [NCPC] following the passage of the 1952 National Capital Planning Act,) and broadly mandated the commission to “prevent pollution of Rock Creek, and the Potomac and Anacostia Rivers, to preserve forests and natural scenery in and about Washington.” In 1930, the *Shipstead-Luce Act* gave the U.S. Commission of Fine Arts (CFA) authority to review the designs of private construction projects within certain areas of the National Capital, specifically for construction that fronts or abuts the grounds of the Capitol, the grounds of the White House, and the Mall park system, as well as Rock Creek Park, the National Zoo, the Rock Creek and Potomac Parkway, the southwest waterfront, and Fort McNair. In 1933-1934, federal parkland in the District of Columbia was consolidated under the management of the NPS. In the years that followed, a number of major memorials were added to the area that would come to be known as the National Mall. The boundary of the National Mall and Memorial Parks (NAMA) is delineated in Figure 1.3.

### PURPOSE

As stated in the Foundation Statement for the National Mall, the purpose of the NAMA is to:

- Preserve, interpret, and manage federal park lands in the National Capital on the land delineated by the *L’Enfant Plan* and the 1902 *Senate Park Improvement Plan* (commonly referred to as the *McMillan Plan*), including green spaces, vistas, monuments, memorials, statues, historic sites, cultural landscapes, and natural and recreation areas
- Preserve places where important events in U.S. history occurred
- Provide opportunities for visitor contemplation, celebration, commemoration, citizen participation, recreation, and demonstration, where the full expression of the constitutional rights of speech and peaceful assembly occur
- Maintain space for the symbols and icons of our nation and its ideals (e.g., equality, freedom, and democracy)

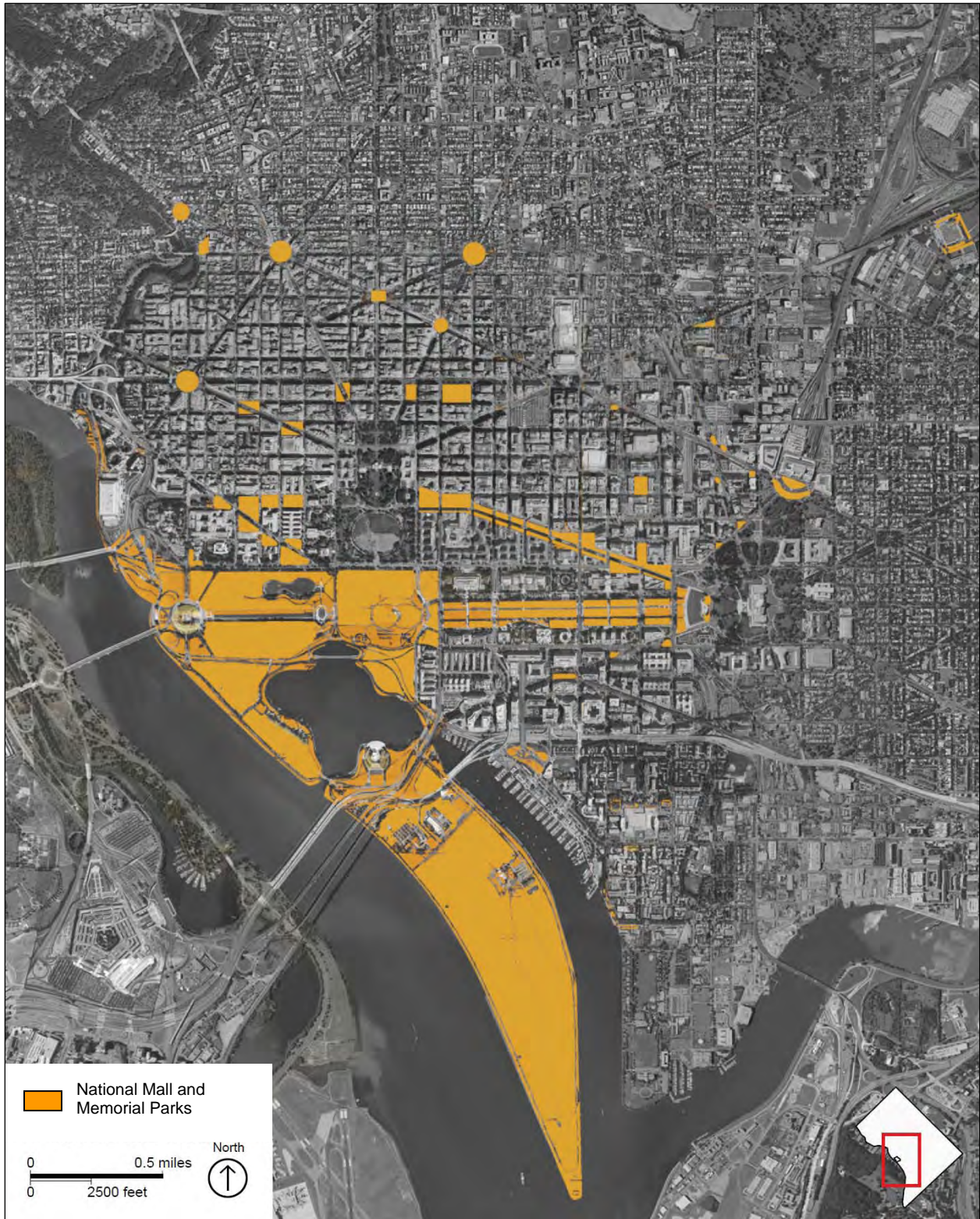
### SIGNIFICANCE

Park significance statements capture the essence of a Park’s importance to the nation’s natural and cultural heritage. Understanding Park significance helps managers make decisions that preserve the resources and values necessary to the Park’s purpose. Several aspects of the NAMA, of which the National Mall is only a part, contribute to its significance.

The areas under NPS stewardship are some of the oldest public lands in our nation, dating from 1791 when the District was established. These areas are vital components of the historic federal city. Much of the area managed by the NAMA reflects the physical expression of the historic *L’Enfant* and *McMillan* plans, reflecting City Beautiful tenets with a coordinated system of radiating avenues, parks, and vistas laid over an orthogonal grid, which was both symbolic and innovative for the new nation.

In addition, the iconography, architecture, and open spaces within the NAMA commemorate individuals and events that symbolize the principal symbols of America’s heritage. NAMA has served as the setting for numerous historic events of national significance and provides a globally recognized platform to exercise democratic First Amendment rights and has served as the setting for national celebrations, parades, festivals, ceremonies, and rallies as well as local and regional events.

Figure 1.3 – Lands Under the Jurisdiction of the National Mall and Memorial Parks





## **Applicable Federal Laws and Regulations**

The NPS is governed by laws, regulations, and management plans before, during, and following any management action considered under any *National Environmental Policy Act* (NEPA) analysis. The following are those that are applicable to the proposed action.

### **NATIONAL ENVIRONMENTAL POLICY ACT, 1969, AS AMENDED**

The NEPA was passed by Congress in 1969 and took effect on January 1, 1970. This legislation established this country's environmental policies, including the goal of achieving productive harmony between human beings and the physical environment for present and future generations. It provided the tools to implement these goals by requiring that every federal agency prepare an in-depth study of the impacts of "major federal actions having a significant effect on the environment" and alternatives to those actions and required that each agency make that information an integral part of its decisions. NEPA also requires that agencies make a diligent effort to involve the interested members of the public before they make decisions affecting the environment.

NEPA is implemented through regulations of the Council on Environmental Quality (40 CFR 1500-1508). The NPS has in turn adopted procedures to comply with the act and the CEQ regulations, as found in DO-12: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (2001), and its accompanying handbook.

### **NATIONAL HISTORIC PRESERVATION ACT, AS AMENDED THROUGH 2000 (16 U.S.C. 470)**

The *National Historic Preservation Act* (NHPA) of 1966, as amended through 2000, protects buildings, sites, districts, structures, and objects that have significant scientific, historic, or cultural value. The act established affirmative responsibilities of federal agencies to preserve historic and prehistoric resources. Effects on properties that are listed in or eligible for the National Register of Historic Places (NRHP) must be taken into account in planning and operations. Any property that may qualify for listing in the NRHP must not be inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate.

### **SECTION 106 OF THE NHPA**

Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, "*Protection of Historic Properties*" (36 CFR Part 800), became effective January 11, 2001.

### **HISTORIC SITES ACT OF 1935**

This act declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. It authorizes the Secretaries of the Interior and NPS to restore, reconstruct, rehabilitate, preserve, and maintain historic or prehistoric sites, buildings, objects, and properties of national historical or archeological significance.

### **NPS ORGANIC ACT**

By enacting the NPS *Organic Act* of 1916 (*Organic Act*), Congress directed the U.S. Department of Interior and the NPS to manage units "to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC § 1). Congress reiterated this mandate in the *Redwood National Park Expansion Act* of 1978 by stating that NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by

Congress” (16 USC 1a-1). Despite these mandates, the *Organic Act* and its amendments afford the NPS latitude when making resource decisions that balance resource preservation and visitor recreation.

Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on Park resources and values. However, the NPS has discretion to allow impacts on Park resources and values when necessary and appropriate to fulfill the purposes of a Park (NPS 2006 sec. 1.4.3). While some actions and activities cause impacts, the NPS cannot allow an adverse impact that would constitute impairment of the affected resources and values (NPS 2006). The *Organic Act* prohibits actions that permanently impair Park resources unless a law directly and specifically allows for the acts (16 USC 1a-1). An action constitutes an impairment when its impacts “harm the integrity of Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006).

#### **NATIONAL PARKS OMNIBUS MANAGEMENT ACT OF 1998**

The *National Parks Omnibus Management Act* (NPOMA) (16 USC 5901 et seq.) underscores NEPA and is fundamental to NPS Park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available and provide options for resource impact analysis should this be the case.

NPOMA directs the NPS to obtain scientific and technical information for analysis. The NPS handbook for DO-12 states that if “such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision will be modified to eliminate the action causing the unknown or uncertain impact, or other alternatives will be selected” (NPS 2006).

#### **AMERICANS WITH DISABILITIES AND ARCHITECTURAL BARRIERS ACT GUIDELINES**

Pursuant to the *Americans with Disabilities Act of 1990* (ADA) and the *Architectural Barriers Act of 1968* (ABA), all public buildings, structures, and facilities must comply with specific requirements related to architectural standards, policies, practices, and procedures that accommodate people with hearing, vision, or other disability; and other access requirements. Public facilities and places must remove barriers in existing buildings and landscapes, as necessary and where appropriate. The NPS must comply with Architectural Barriers Act Accessibility Standard (ABAAS) as well as ADA standards for this project.

#### **REDWOOD NATIONAL PARK ACT OF 1978, AS AMENDED**

All national park system units are to be managed and protected as Parks, whether established as a recreation area, historic site, or any other designation. This act states that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.”

#### **CLEAN WATER ACT (1972, AS AMENDED IN 1977 AND 1987)**

The goal of the *Clean Water Act* (CWA) is to reduce water pollution by regulating the release of high amounts of toxic substances into water bodies and ensuring that surface waters meet standards that allow for recreational and sporting activities. As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program is organized within the Environmental Protection Agency (EPA) and controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Any federal, industrial, or municipal facilities must obtain NPDES permits if their discharges go directly to surface waters.

## **Executive Orders and Director's Orders**

### **DIRECTOR'S ORDER 28: CULTURAL RESOURCE MANAGEMENT**

*Director's Order 28* calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the *NPS Management Policies* (NPS 2006). This order also directs the NPS to comply with the substantive and procedural requirements described in the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*, the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Treatment of Cultural Landscapes*; and the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Building*. Additionally, the NPS will comply with the 2008 Service-wide Programmatic Agreement (PA) with the ACHP and the National Conference of State Historic Preservation Officers. The accompanying handbook to this order addressed standards and requirements for research, planning, and stewardship of cultural resources as well as the management of archeological resources, cultural landscapes, historic and prehistoric structures, museum objects, and ethnographic resources.

### **DIRECTOR'S ORDER 42: ACCESSIBILITY FOR VISITORS WITH DISABILITIES IN NATIONAL PARK SERVICE PROGRAMS AND SERVICES**

*Director's Order 42* approaches the issue of accessibility in a comprehensive, organized way, rather than on a project-by-project basis. The primary goal of the program is to develop and coordinate a system-wide, comprehensive approach to achieving the highest level of accessibility that is reasonable, while ensuring consistency with the other legal mandates of conservation and protection of the resources that the NPS manages. Since 1980, the NPS has been working with accessibility coordinators in each regional office, and in parks and program offices, to: (1) assess the level of accessibility of various parks; (2) identify the barriers to accessibility; (3) develop policies and guidelines regarding appropriate methods and techniques for improving access; and (4) provide technical assistance and in-service training on effective approaches and program implementation. The NPS employs the principles of universal design in providing facilities for everyone, rather than for only a portion of the population, including those persons with invisible disabilities such as cardiac and respiratory problems; those who have temporary disabilities such as broken arms or legs; and parents with strollers and wheeled devices.

### **DIRECTOR'S ORDER 77-2: FLOODPLAIN MANAGEMENT**

*Director's Order 77-2* was issued in response to *Executive Order 11988, Floodplain Management*. This order applies to all proposed NPS actions that could adversely affect the natural resources and functions of floodplains or increase flood risks. This includes those proposed actions that are functionally dependent upon locations in proximity to the water and for which non-floodplain sites are not practicable alternatives.

### **NATURAL RESOURCES MANAGEMENT GUIDELINE, NPS-77 (1991)**

The purpose of this document is to provide guidance to park managers for all planned and ongoing natural resource management activities. Managers must follow all federal laws, regulations, and policies. This document provides the guidance for park management to design, implement, and evaluate a comprehensive natural resource management program.

## **Local Plans**

All action alternatives need to consider local plans and policies. The following initiatives serve to guide development and address important planning issues facing the National Capital Region, the monumental core, and the National Mall.

**L'ENFANT PLAN (1791)**

The original comprehensive plan of Washington, D.C., was designed by Peter (Pierre) Charles L'Enfant in 1791 as the site of the federal city. L'Enfant developed a plan that featured ceremonial spaces and grand radial avenues while respecting the natural contours of land. The resulting plan was a system of orthogonal streets with intersecting diagonal avenues that connected the most significant and important landmarks in the city.

**THE McMILLAN PLAN (1901)**

The ambitious *McMillan Plan*, created by the Senate Park Commission in 1901, sought to re-establish elements of the *L'Enfant Plan*, which included the restoration of the east end of the Mall, the correction of the awkward off-axis placement of the Washington Monument, the inclusion of the new "Potomac Park" (i.e., East and West Potomac Parks), and the removal of railroad tracks from the monumental core (Robinson & Associates 1999). The Commission envisioned the Mall as a formal tree-lined walk flanked by classical buildings, creating an unbroken vista between the Capitol and Washington Monument. The visual focal point of the *McMillan Plan* was the Mall, which the Commission proposed to extend westward and enhance as a formal, axial greensward. The McMillan Commission members interpreted the *L'Enfant Plan* as calling for treating the entire Mall, now referred to as the National Mall, as a continuous space to be set aside entirely for public use. A specific landscape treatment plan for the Mall consisted of a greensward flanked on either side by four rows of elm trees (Moore 1902).

**NPS MASTER PLAN FOR THE WASHINGTON MALL (1976)**

In 1976, Skidmore, Owings, and Merrill prepared a master plan for the NPS that delineated how the *McMillan Plan* would actually be realized in the Mall of the 1970s with an emphasis on pedestrian use.

**EXTENDING THE LEGACY PLAN (1997)**

In 1997, the NCPC completed the plan entitled *Extending the Legacy: Planning America's Capital for the 21st Century*, which is the current guiding document for the monumental core. This plan provides a framework that expands upon the *L'Enfant Plan* and the *McMillan Plan*. It favors preserving the open landscape of the Monument Grounds and also redefines the monumental cores, extending its boundaries along North Capitol, South Capitol, and East Capitol Streets.

The plan calls for economic development in every section of the city including new parks, offices, and transit centers throughout. The plan acknowledges the division of the city by elevated highways and railroad tracks and calls for the removal of obsolete tracks and roads and relocation of active tracks and roads into tunnels beneath the city and the Potomac and Anacostia Rivers. This will allow for the broad avenues envisioned by the *L'Enfant Plan* to be restored and increase aesthetic value in the city. With an expected 70 percent increase in automobile traffic by 2025, the *Legacy Plan* suggests that behavioral patterns need to change in regards to commuting options. Two-thirds of the employees working in D.C. commute from outside the city. Many use single-occupancy vehicles. The *Legacy Plan* states that transportation initiatives will only work if employers develop transportation management programs that allow employees to have flexible schedules and carpooling incentives.

Besides transportation initiatives, the *Legacy Plan* calls for restoring the waterfront of the city. Pierre L'Enfant envisioned a great city that focused its attention on the Potomac and Anacostia Rivers. The rivers are not visible in some locations due to buildings situated directly on the banks. The *Legacy Plan* outlines plans for a waterfront stretching from Georgetown to the National Arboretum, with quiet open spaces and other areas used for festivals, concerts, and other urban activities. The Anacostia waterfront would have a relaxed neighborhood feel and would focus on the environment and ecology that will ultimately help reduce the amount of pollution in the Anacostia River.

The plan discusses the revitalization of South Capitol Street and M Street and is considered the first major initiative of the *Legacy Plan*. However, smaller projects will take place during this time. The *Legacy Plan* outlines guidelines and implementation plans and even includes the possibility of relocating the Supreme Court to a location along the waterfront. The *Legacy Plan* is now the general framework for Washington, D.C., and all plans since then have been based on this document.

Because intense construction of memorials and museums in the monumental core would overwhelm the historic open space on the National Mall and surrounding areas, this plan encourages new construction away from the National Mall and towards geographically significant areas in other quadrants of the city to generate more dispersed economic development.

#### **THE MEMORIALS AND MUSEUMS MASTER PLAN (2001)**

The NCPC's *Memorials and Museums Master Plan (2001)* was generated out of the recognition that the popularity of the monumental core may soon surpass its capacity to accommodate new monuments and memorials in a setting that remains historic, open, and beautiful. The goal of the plan was to identify and promote new sites outside the monumental core to disperse new monuments and memorials to protect the environment and character of the National Mall. The basis for memorial location is the Commemorative Works Act of 1986, which provides standards for the placement of memorials on certain federal land in Washington, D.C., and environs<sup>3</sup>. The project area is located in the Reserve. Chapter 89 of Title 40 of the Commemorative Zone Policy of the Memorials and Museums Master Plan discourages development on the National Mall and Washington Monument reservation and designates a "Reserve" area on the cross-axis of the Mall where no new memorials will be permitted.

#### **THE NATIONAL CAPITAL URBAN DESIGN AND SECURITY PLAN (2002)**

In October 2002, the NCPC developed a *National Capital Urban Design and Security Plan (NCUDSP)*. This plan was developed in cooperation with federal agencies, the District government, security experts, the professional planning and design community, the architect of the Capitol, and the public, as well as the U.S. Secret Service. The NCUDSP outlines the need to improve security in the National Capital but to do so in a manner that is aesthetically pleasing to residents, workers, and tourists visiting the area. The temporary security structures put into place after the Oklahoma City bombings and increased after the September 11<sup>th</sup> (2001) attacks are often criticized for being unsightly and limiting to pedestrian access. The plan focuses exclusively on perimeter building security designed to protect employees, visitors, and federal functions and property from threats generated by unauthorized vehicles approaching or entering sensitive buildings.

The plans outlined in NCUDSP include using architectural elements to enhance the security around federal buildings. These elements include decorative lighting, planters that are also benches, bollards, fencing, and lawns. The plan does not address issues such as building hardening, operation procedures, or surveillance. Initial findings from the NCUDSP state that many of the buildings along Constitution Avenue and Independence Avenue do not meet the minimum setback distance from the curb. To meet the setback requirement, curbs or parking lanes might have to be removed (NCPC 2001).

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<sup>3</sup> The Commemorative Works Act provides standards and approval requirements as well as permitting requirements for location and design of new memorials and monuments in the District. The act distinguishes between the adjacent portions of the District, where the commemorative works of "pre-eminent historical and lasting significance" to the nation may be located, and areas outside this zone where works of "lasting historical significance" can be placed. It also seeks to preserve the urban design legacy of the L'Enfant and McMillan plans by protecting public open space and ensuring that future museums and memorials are appropriately located and designed.

### **COMPREHENSIVE PLAN FOR THE NATIONAL CAPITAL: FEDERAL ELEMENTS (2004)**

In August 2004, NCPC adopted the *Comprehensive Plan for the National Capital: Federal Elements*. The plan is a statement of goals, principles, and planning policies for the growth and development of the National Capital during the next twenty years. The plan encompasses all federal lands in Washington, D.C., and the surrounding areas, including Montgomery and Prince George's Counties in Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties in Virginia; and all cities within the boundaries of those counties. The federal elements of the *Comprehensive Plan for the National Capital* identify and address the current and future needs of federal employees and visitors to the Nation's Capital; provide policies for locating new federal facilities and maintaining existing ones; guide the placement and accommodation of foreign missions and international agencies; promote the preservation and enhancement of the region's natural resources and environment; protect historic resources and urban design features that contribute to the image and functioning of the Nation's Capital; and, working with local, state, and national authorities, support access into, out of, and around the Nation's Capital that is as efficient as possible for federal and nonfederal workers.

### **PROPOSED FEDERAL CAPITAL IMPROVEMENTS PROGRAM (2006)**

In 2006, the NCPC completed the Federal Capital Improvements Program (FCIP) for fiscal years 2007 – 2012. This document lays out the proposed budgetary commitments as reviewed and evaluated by the NCPC regarding federal activities in Washington, D.C., and the surrounding Maryland and Virginia counties. The FCIP plans the budget for a six fiscal-year cycle. Projects listed in this document are not assumed to be approved, but rather the document includes the NCPC's comments and recommendations for future projects. The NCPC drafted an FCIP for fiscal years 2008-2013 on June 7, 2007. The recommendations of the plan include:

- Reconfiguring South Capitol Street corridor into an urban boulevard, providing a gateway to the Nation's Capital and South Capitol Street reconstruction
- Stormwater management system throughout Washington, D.C.
- Washington, D.C., and vicinity flood control projects including:
  - A levee between the Lincoln Memorial and the Washington Monument
  - Raising a section of P Street SW, adjacent to Fort McNair
- Southeast Federal Center remediation
- Repairs to Thomas Jefferson Memorial seawalls
- Improved pedestrian linkages between the National Mall attractions and the Anacostia/Potomac River waterfronts
- National Mall road improvements, resurfacing, streetscaping, etc.

### **NATIONAL CAPITAL FRAMEWORK PLAN (PLANNING INITIATIVE)**

The *National Capital Framework Plan (Framework Plan)* is a multi-agency effort led by the NCPC with the CFA. This planning effort shows how to create new and accessible destinations for cultural attractions throughout the city. The *Framework Plan* provides a comprehensive approach to easing demand for construction on the National Mall in addition to creating attractive urban locations throughout the city. A preliminary plan was released in fall 2007, accentuating the *Extending the Legacy Plan* and the *Malls and Memorials Master Plan*.

### **THE NATIONAL MALL PLAN (ONGOING)**

The NPS is preparing the *National Mall Plan*, which will provide a long-term vision for the use and management of The National Mall and Pennsylvania Avenue National Historic Park. The NPS *National Mall Plan* is a long-term plan to guide resource conservation and management and operations on portions of the National Mall under NPS jurisdiction as well as individual monuments and operations on portions of the National Mall under NPS jurisdiction. The planning effort will result in a plan covering a longer time frame than a general management plan would and will address a finer level of detail. While the

NAMA covers many national park units within the nation's capital, this plan addresses the National Mall (West Potomac Park, The Washington Monument, and the Mall). The National Mall hosts more than 25 million visitors a year, and as a result, there are substantial impacts on its natural and cultural resources. The *National Mall Plan*, the associated environmental impact statement (EIS), and the Section 106 process address issues related to landscape maintenance, facilities, and visitor use.

Ongoing projects common to all alternatives include relocation of the temporary NPS concession facility northeast of the Washington Monument to allow for construction of the National Museum of African American History and Culture (NMAAHC), the Dr. Martin Luther King Jr. Memorial (MLK), the Vietnam Veterans Memorial Center (VVMC), the Potomac Park Levee, replacement of a sign system, road projects on Ohio Drive and Madison Drive, and an expanded interpretive visitor transportation system to serve more destinations and offer more frequent service (NPS 2008).

## **NPS Management Policies**

The *NPS Management Policies 2006* (NPS 2006) is the basic NPS-wide policy document, adherence to which is mandatory unless specifically waived or modified by the NPS Director or certain Departmental officials, including the U.S. Secretary of Interior. Actions under this EA are in part guided by these management policies. Sections which are particularly relevant to this project are as follows:

### **SECTION 4.1.3 - EVALUATING IMPACTS ON NATURAL RESOURCES**

The NPS will ensure that the environmental costs and benefits of proposed actions are fully and openly evaluated before taking implementing actions that may impact the natural resources of parks. The process of evaluation must include public engagement; the analysis of scientific and technical information in the planning, evaluation, and decision-making processes; the involvement of interdisciplinary teams; and the full incorporation of mitigation measures and other principles of sustainable park management (NPS 2006).

### **SECTION 5.3.1 - PROTECTION AND PRESERVATION OF CULTURAL RESOURCES**

The NPS will endeavor to protect cultural resources against overuse, deterioration, environmental impacts, and other threats without compromising the integrity of cultural resources (NPS 2006).

### **SECTION 8.2.1 - VISITOR CARRYING CAPACITY**

The NPS will identify visitor carrying capacities for managing public use and will identify ways to monitor and address unacceptable impacts on park resources and visitor experiences (NPS 2006).

### **SECTION 8.2.5.1 - VISITOR SAFETY**

The NPS strives to protect human life and provide for injury-free visits. As a result, the NPS will apply national safety codes and standards to prevent injuries or recognizable threats to visitor safety and will reduce or remove known hazards. Examples of visitor safeguards include the installation of artificial lighting or paved walking surfaces (NPS 2006).

### **SECTION 9.1.2 - ACCESSIBILITY FOR PERSONS WITH DISABILITIES**

The NPS will provide accessible facilities and resources in a manner that is consistent with preserving park resources and providing visitor safety and high-quality visitor experiences. The policy states that “in most instances, the degree of accessibility provided will be proportionately related to the degree of human-made modifications in the area surrounding the facility and the importance of the facility to people visiting or working in the park (NPS 2006).”

### **SECTION 9.1.5.1 - WATER SUPPLY SYSTEMS**

The NPS mandate is to use water efficiently and sustainably. The design of water systems will maximally conserve water and the energy used in its treatment and distribution. The policy states that “new water systems, or extensions to existing systems, will be constructed only if reasonable conservation measures will not be sufficient to cover park needs... Where feasible and appropriate, and given resource availability, groundwater sources will generally be developed rather than surface water diversions in parks” (NPS 2006).

### **Scoping**

NEPA regulations require an “early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.” To determine the scope of issues to be analyzed in depth in this plan, meetings were conducted with park staff and the public.

In addition to internal and agency scoping, public scoping for the Lincoln Memorial Reflecting Pool Rehabilitation EA began June 30, 2009, and concluded August 14, 2009. During this time, a public scoping meeting was held on July 9, 2009, at the Old Post Office Pavilion, 1100 Pennsylvania Avenue NW, Washington, D.C. Notice of the public meetings was posted on the Planning, Environment, and Public Comment website (PEPC), and the NPS sent email notices of the meeting to individuals and organizations. Approximately one dozen people attended the meeting, including representatives from NCPC, the National Coalition to Save Our Mall, Guild of Professional Tour Guides, Committee of 100, and the Smithsonian Institution. The purpose of this meeting was to solicit public input on the purpose, need, and objectives of the project, major issues, and potential alternatives.

At the public meeting and during the 30-day public comment period, comments were received from the National Coalition to Save Our Mall, Guild of Professional Tour Guides, and Committee of 100. Generally, the comments articulated support for the proposed enhancements and rehabilitation of the elm walks, lower approachway, and Reflecting Pool. Some constituents stated that the NPS should explore alternative recreational uses for portions of the project area, including ice skating, fountains, and sculptures in the Reflecting Pool and a multi-transit plan along the elm walks. The NPS responded that these suggestions were outside the scope of the current project.

### **Issues and Impact Topics**

Issues describe problems or concerns associated with current impacts from environmental conditions or current operations as well as problems that may arise from the implementation of any of the alternatives. Park staff identified potential issues associated with the construction or implementation of the Reflecting Pool improvements during internal scoping. The NPS’ primary concern is to ensure that any alternative considered will allow for minimal disturbance of the existing Park uses and the cultural landscape. The issues and concerns identified during scoping were grouped into impact topics that are discussed in “Chapter 3: Affected Environment” and are analyzed in “Chapter 4: Environmental Consequences.”

### **Issues and Impact Topics Analyzed in this EA**

#### **VISITOR USE AND EXPERIENCE**

The rehabilitation of existing elements would result in impacts on visitor use and experience, affecting movement and circulation and respite areas (such as the steps and seating areas along the elm walks and lower approachway). To the maximum extent practicable, construction activity would be timed to avoid impacts to special events such as Memorial Day and the 4th of July. As a result of potential impacts to visitor use and experience that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.



### **PUBLIC HEALTH AND SAFETY**

The majority of visitor incidents within the Park are related to visitors tripping over curbs, uneven surfaces, or steps. The rehabilitation and repair of existing elements would result in impacts on public health and safety, likely reducing the number of incidents currently attributed to deteriorating infrastructure. As a result of potential impacts to public health and safety that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **PARK MANAGEMENT AND OPERATIONS**

Due to a combination of pervasive water leakage and evaporation, the operating cost to sustain the volume of water in the Reflecting Pool is exceptionally high. In addition to exploring options to improve the efficiency of water usage, the NPS is considering various methods to improve the water quality in the Reflecting Pool. As a result of potential impacts to park management and operations that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **CULTURAL RESOURCES**

The original design intent of the project area was inspired by the French formal landscape design principles of the 17th century which included dramatic vistas, strong axial patterns, symmetry, linear walkways, reflecting pools, and open lawn. Proposed modifications to the Reflecting Pool and the surrounding area could compromise the historic integrity of these features. As a result of potential impacts to cultural resources that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **AESTHETICS AND VISUAL QUALITY**

The construction of some of the Reflecting Pool improvements would result in changes to the visual character and views and vistas in the project area, specifically to the area around the lower approachway. Other changes would affect vistas between the World War II and Lincoln Memorials and the view from the top of the Washington Monument. As a result of potential impacts to visual resources that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **WATER RESOURCES**

The Reflecting Pool and its water quality—as well as that of adjacent water bodies—might be affected by options meant to improve their water supply efficiency and sustainability and discharge. If an alternative water source is used, the NPS wants to ensure that the water quality is maintained or enhanced through various methods of filtering and treating the water to preserve the appearance of the Reflecting Pool. As a result of potential impacts to water resources that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **SOILS**

As a result of constant use by the number of visitors who walk between the adjacent monuments and memorials and who use other portions of the site, the project area is currently subject to continued erosion and compaction of the soils. Several actions are proposed that would affect the future level of soil compaction and erosion. As a result of potential impacts to soils that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **VEGETATION**

Similar to soils, visitors to the project area disturbed the vegetation, particularly the turf around the Reflecting Pool and portions of the elm walks in which certain places have been worn into dirt paths by constant use. The proposed actions would affect the turf and disturbed land in the project area, whereas

the majority of shrubs and trees would not be affected. As a result of potential impacts to vegetation that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

#### **FLOODPLAINS**

Portions of the project area are located in the 100-year and 500-year floodplains; therefore, this resource topic must be analyzed. As a result of potential impacts to floodplains that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

#### **TRAFFIC AND TRANSPORTATION**

The scope of the proposed actions would possibly affect traffic and transportation on adjacent roadways during construction due to the installation or removal of infrastructure (subsurface pipes, pump stations, foundation slab, etc.) that would possibly require temporary partial closures of some roadways during off-peak hours. As a result of potential impacts to traffic and transportation that would occur from both the no action and action alternatives, this resource area is addressed as an impact topic in this EA.

### **Impact Topics Dismissed from Further Analysis**

Several impact topics that originated from the NPS Environmental Screening Form (ESF), or that were initiated during the scoping process, were initially considered for analysis in this EA but were eliminated from further analysis following discussions with the Park staff and public scoping input.

#### **AIR QUALITY**

The 1963 *Clean Air Act*, as amended (42 USC 7401 et seq.), requires federal land managers to protect air quality in national parks. The project site is located in the Washington Metropolitan Area nonattainment zone for ozone. During construction, local air quality would be temporarily affected by dust and vehicle emissions. Hauling material and operating equipment would result in increased vehicle exhaust and emissions during the construction period. Hydrocarbons, nitrogen oxide, and sulfur dioxide emissions would be rapidly dissipated by air drainage since air stagnation is uncommon at the project site. Fugitive dust plumes from construction equipment would occasionally increase airborne particulates in the area near the project site; however, these loading rates would be of short duration and of negligible to minor consequence. Overall, there would be a slight and temporary degradation of local air quality due to dust generated from construction activities, but these effects would be localized and negligible to minor. The park's current level of air quality would not be affected by the proposed project; therefore, this impact topic was dismissed from further analysis.

#### **ARCHEOLOGY**

The project area was originally open water at the mouth of Tiber Creek, but it was filled in the late 19<sup>th</sup> century primarily to maintain the navigation channel of the Potomac River. Afterwards, the area became known as Potomac Flats. In 1898, the Supreme Court decided the Potomac Flats Case, enabling the McMillan Commission to develop plans for public parkland. Subsequently, the project area was converted to recreational use. As the entire landmass consists of landfill—mostly dredged silt from the Potomac River—no archeological resources should be expected, so the topic was dismissed from analysis.

#### **ENVIRONMENTAL JUSTICE**

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This order directs agencies to address environmental and human health conditions in minority and low-income communities to avoid the disproportionate placement of any adverse effects from federal policies and actions on these populations. Local residents may include low-income populations, but these populations would not be

particularly or disproportionately affected by activities associated with the rehabilitation of the Reflecting Pool and surrounding area; therefore, this impact topic was dismissed from further analysis in this EA.

#### **ETHNOGRAPHIC RESOURCES**

Ethnographic resources are defined by the NPS as any “site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence or other significance in the cultural system of a group traditionally associated with it” (NPS 1998). In this analysis, the NPS’ term “ethnographic resource” is equivalent to the term “Traditional Cultural Property” (TCP) which is more widely used in cultural resource management. Guidance for the identification of ethnographic resources is found in National Register Bulletin #38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (NPS 1998). The key considerations in identifying TCPs are their association with cultural practices or beliefs of a living community that are (1) rooted in the community’s history and (2) are important in maintaining the continuing cultural identity of the community (Parker and King 1998). There are no properties that meet the definition of a TCP within the APE; therefore, ethnographic resources are dismissed as an impact topic.

#### **GEOHAZARDS**

There are no known geohazards located within the proposed project area; therefore, this topic was dismissed from further analysis.

#### **GEOLOGY AND TOPOGRAPHY**

The proposed action would not require excavation or grading in a way that would disrupt any geological or topographical resources. In addition, the majority of the portion of the National Mall that would be disturbed consists of fill. As a result, this topic was dismissed from further analysis.

#### **MARINE OR ESTUARINE RESOURCES**

There are no marine or estuarine resources within the project area; therefore, this impact topic was dismissed from further analysis.

#### **MUSEUM COLLECTIONS**

None of the proposed actions would have any direct effects upon recognized museum collections (historic artifacts, natural specimens, and archival and manuscript material); therefore, this impact topic was dismissed from further analysis.

#### **PALEONTOLOGICAL RESOURCES**

There are no known paleontological resources located within the proposed project area; therefore, this topic was dismissed from further analysis.

#### **PRIME FARMLAND**

Prime farmland is defined as land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and which is also available for these uses. Prime farmland is protected under the *Farmland Protection Policy Act* of 1981 to minimize the extent to which federal programs contribute to the unnecessary or irreversible conversion of farmland to nonagricultural uses. No prime farmlands are found within the project area; therefore, this topic was dismissed from further analysis.

#### **SOCIOECONOMICS**

NEPA requires an analysis of impacts to the human environment, which includes economic, social, and demographic elements in the affected area. Construction activities associated with the proposed actions may bring a short-term need for additional personnel in the Park, but this addition would be minimal and

would not affect the surrounding community's overall population, income, and employment base. The proposed actions would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a beneficial impact to the economies of nearby areas (e.g., minimal increases in employment opportunities for the construction workforce and revenues for local businesses and government generated from construction activities and workers). Any increase, however, would be difficult to measure. Therefore, socioeconomics was dismissed as an impact topic.

#### **SOUNDSCAPES AND NOISE**

Natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Although the range of proposed actions would introduce new equipment and an increased presence of vehicles within the project area especially during construction, the level of resultant noise would not appreciably diminish visitor enjoyment or experience nor would the noise be inconsistent with activities in a highly urbanized area. As a result, noise was dismissed from further analysis.

#### **THREATENED, ENDANGERED, RARE, AND SPECIAL CONCERN SPECIES**

There are no rare, threatened, or endangered species or habitat known or expected to occur in the project area; therefore, this impact topic was dismissed from consideration.

#### **UNIQUE ECOSYSTEMS, BIOSPHERE RESERVES, WORLD HERITAGE SITES**

There are no known biosphere reserves, World Heritage sites, or unique ecosystems listed in the Park; therefore, this impact topic was dismissed from further analysis.

#### **UTILITIES AND INFRASTRUCTURE**

The proposed action would not require excavation that would require the relocation of utilities. In addition, the proposed actions will have only negligible impacts to utilities on both a local and regional level; therefore, this impact topic was dismissed from further analysis.

#### **WETLANDS**

There are no wetlands that would be affected by any of the proposed actions; therefore, wetlands were not addressed as an impact topic in this EA.

#### **WILDLIFE OR WILDLIFE HABITAT**

The project area is in a relatively urban setting, surrounded by manicured lawns and landscaping. It is adjacent to heavily used roads with attendant vehicle noise. As a result, wildlife in the project area is limited to adapted urban species, such as raccoons, waterfowl, squirrels, songbirds, and an occasional hawk using the larger trees as a perch. No nesting of raptors is known or expected. Although construction-related activities may temporarily displace wildlife from the area, the proposed action would not result in greater than negligible effects on wildlife or wildlife habitat. Due to the area's urban context, level of human activity, and minimal habitat value, this topic was dismissed from detailed analysis.

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# CHAPTER 2: ALTERNATIVES

## Introduction

NEPA requires that federal agencies explore a range of reasonable alternatives. The alternatives under consideration must include the “no action” alternative as prescribed by 40 CFR 1502.14. Any alternative analyzed must meet the management objectives of the Park, either wholly or partially, while also meeting the purpose of and need for the project.

Project alternatives may originate from the proponent agency, local government officials, or members of the public. Alternatives may also be developed during the early stages of project development at public meetings or in response to comments from coordinating or cooperating agencies. The alternatives analyzed in this document are the result of internal scoping, public scoping, and agency consultation. The components of the action alternative represent the outcome of extensive collaboration between the NPS, the consultant design team, and regulatory review agencies in the project area.

The NPS explored and objectively evaluated a range of alternatives. After extensive collaboration between the NPS, cooperating agencies, and the project team consultant’s designers and engineers, several alternatives were dismissed from consideration and two alternatives (the no action alternative and the action alternative, which contains several different options or alternatives for specific elements) were carried forward for further analysis. These are briefly summarized below and in Table 2.1 and are described in more detail later in this chapter.

### **THE NO ACTION ALTERNATIVE (ALTERNATIVE 1)**

The no action alternative represents a continuation of the existing operations and maintenance and existing visitor use of the Reflecting Pool, Lincoln Memorial east plaza, and surrounding structures and circulation paths.

Along the length of the elm walks, the multiple benches, trash receptacles, and temporary lighting fixtures would remain in their current location and would continue providing visitor comfort and would not change in condition, quality, or volume.

The temporary concrete barriers in the center section of the east plaza would remain in place and would continue to provide a secure vehicular barrier to the Lincoln Memorial.

At the Reflecting Pool, the current condition, operation, and maintenance of the circulation and infrastructure, including the structural and water systems, would remain the same. There would be no changes to the existing worn dirt paths that flank the Reflecting Pool. The structural system (foundation slab, perimeter grade beam, granite coping, and joint system) would not be altered and would be maintained in accordance with the ongoing Park schedule and budget. The water source would be furnished by the municipal supply and would be chemically treated. During the cleaning and inspection that occurs once or twice annually, the Reflecting Pool would be discharged to the Tidal Basin.

**THE ACTION ALTERNATIVE (ALTERNATIVE 2)**

The action alternative describes proposed improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources in three locations in the project area: the elm walks, Lincoln Memorial east plaza, and the Reflecting Pool. Several of the proposed actions at specific locations are straightforward and have only one solution for their implementation. However, other proposed actions are more complex with variations that allow the project objectives to be resolved by multiple options.

- At the east plaza, Option A1, Option A2, and Option A3 present multiple configurations of curved walkways and security walls and/or bollards to enhance accessibility and security in the project area.
- At the Reflecting Pool, Options B1, B2, and B3 present three different methods to repair the structural integrity of the foundation slab, grade beam, joints, and coping.
- Options C1, C2, and C3 offer different comprehensive strategies to improve the efficiency and sustainability of the water system at the Reflecting Pool, which includes the water source, quality (treatment and filtration), and discharge.

Table 2.1 summarizes the no action alternative and the action alternative with various options.

Table 2.1 – Description of No Action and Action Alternatives

Location	No Action Alternative 1	Action Alternative 2		
Elm Walks	The existing location, condition, and number of site furnishings and temporary lighting fixtures would remain unchanged.	The site furnishings (lighting fixtures, benches, and trash receptacles) would be refurbished (lighting fixtures, benches, and trash receptacles) would be refurbished and/or replaced and relocated to the outboard side of the walkways; drinking fountains and site irrigation valves would be installed at various points.		
	The asphalt walking surface would remain unaltered.	The elm walks would be resurfaced.		
Lincoln Memorial east plaza	The existing utility service to the Korean War Veterans and Vietnam Veterans kiosks would be unchanged.	Subsurface conduit would be installed and capped to accommodate future utility needs at the kiosks.		
	The lower approachway staircases and landings and terrace would remain in its current condition.	The lower approachway staircases, landings, and terrace would be rehabilitated to repair wear and damage and to improve public safety.		
	The staircases at western termini of the elm walks and lower approachway would continue to provide a non-ADA/ABAAS compliant path to the east plaza; Temporary concrete barriers would continue to provide a vehicular barrier for the project area.	In options A1, A2, and A3, a permanent vehicular barrier system would be integrated with new symmetrical and curvilinear ADA/ABAAS-accessible paths from the east plaza to the Reflecting Pool. Each option allows for some of the metal bollards around the Lincoln Memorial Circle to be removed. The use of grading reduces the visible portion of security walls. Irrigation valves would be installed at the top of the lower approachway on the east plaza.		
	The Reflecting Pool and the elm walks and lower approachway structures would be maintained in accordance with the Park's ongoing maintenance and operations schedule; this would not address or remove existing deficiencies.	<b>Option A1</b>  This option uses bollards and security walls around the outer path of the walkways.	<b>Option A2</b>  This option uses bollards along the inner path of the walkways.	<b>Option A3</b>  This option uses security walls along the inner path of the south side and retaining walls along both sides of the north walkway.
Reflecting Pool	<b>Circulation:</b> The worn dirt paths to the north and south of the Reflecting Pool would remain unchanged.	The worn dirt paths would be paved and made into sidewalks. The sidewalks would tie into the existing paths around the World War II Memorial.		
	<b>Structural System:</b> The slab, grade beam, and coping would continue to provide structural support to the Reflecting Pool, subject to routine periodic maintenance by NPS staff.	<b>Option B1</b>  Portions of the foundation slab and grade beam would be patched and repaired in place.	<b>Option B2</b>  The existing system would be removed. A new system using a slab supported on deep foundation piles would be constructed. The existing granite coping would be reset.	<b>Option B3</b>  The existing system would be removed. A new unified system that ties the slab and sidewalk together would be installed. No deep foundation piles would be required.
		<b>Option C1</b>  The water source would be taken from the Potomac River, maintaining a constant flow, and would continuously discharge to the Tidal Basin. The water would be filtered to improve the appearance and quality. The Reflecting Pool would be cleaned and inspected bi-annually.	<b>Option C2</b>  The water source would be furnished by the municipal supply and would be filtered and treated to improve the water quality and recirculated within the Reflecting Pool. Water would discharge to the city's sanitary sewer during an annual cleaning and inspection.	<b>Option C3</b>  The water source would be taken from the Tidal Basin, maintaining a constant flow, and would continuously discharge to the Potomac River. The water would be treated to improve the appearance and quality. The Reflecting Pool would be cleaned and inspected bi-annually.
	<b>Water System:</b> The water source would be furnished by the municipal supply; it would be chemically treated; the water would discharge to the Tidal Basin during the cleaning and inspection that occurs once or twice annually for a duration of 10 to 14 days.			



**Alternative 1: No Action**

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and Lincoln Memorial east plaza. The existing conditions and management of specific resources at the various locations are described below.

**ELM WALKS**

Along the length of the elm walks, the multiple benches, trash receptacles, and temporary lighting fixtures would remain in their current location<sup>1</sup> and would continue providing visitor comfort and would not change in condition, quality, or volume. These resources would be maintained under the existing Park maintenance schedule.

The asphalt walking surface of both elm walks would be unchanged. The surface of the walkways would continue to be uneven and the edges would continue to deteriorate, presenting tripping hazards. These walkways would be maintained according to the existing Park maintenance schedule, but deficiencies would not be addressed.

**LINCOLN MEMORIAL EAST PLAZA**

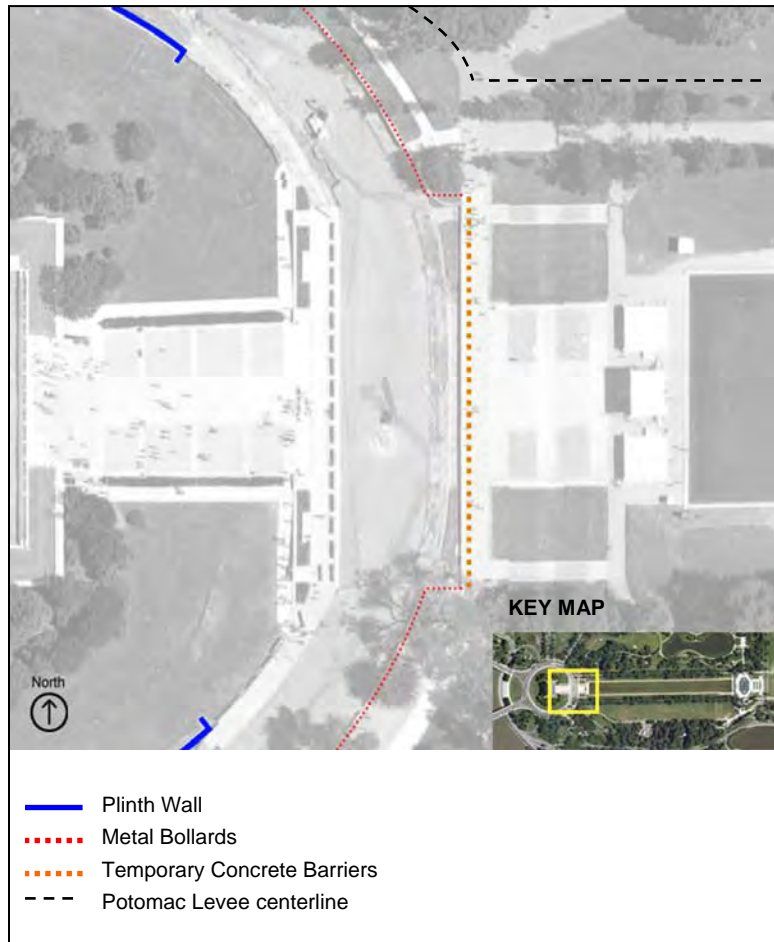
The Lincoln Memorial east plaza is located between the Lincoln Memorial and lower approachway stairs and landings (See Figure 2.2).

The east plaza was created as part of the Lincoln Memorial Circle Rehabilitation and Security project completed in 2008. As part of the consultation for this project<sup>2</sup>, the NPS proposed that the security system be

Figure 2.1 – Typical Seating Area and Temporary Lighting Fixture along the Elm Walks



Figure 2.2 – Lincoln Memorial East Plaza Existing Vehicular Barrier System



<sup>1</sup> Along both elm walks, the lighting fixtures are located to the inbound side, closest to the Reflecting Pool. Benches and trash receptacles are located to the outboard (north) side of the north elm walk and along both sides of the south elm walk.

closed on the east side by a line of temporary concrete barriers so the rest of the project could be completed on schedule. The NPS agreed to seek funding to develop a comprehensive treatment plan for the Reflecting Pool area, including permanent physical security measures on the east side of the memorial.

Under the no action alternative, the temporary concrete barriers in the center section of the east plaza would remain in place and would continue to provide a secure vehicular barrier to the Lincoln Memorial. However, implementation of the no action alternative would not satisfy the terms of the consultation for the east plaza whereby the NPS would address design concerns, maintenance problems, accessibility, and security needs on the east side of the Lincoln Memorial, including replacement of the temporary concrete barriers.

**REFLECTING POOL**

The no action alternative represents the current condition, operation, and maintenance of various aspects of the Reflecting Pool.

- **REFLECTING POOL CIRCULATION** – There would be no changes to the existing worn dirt paths that flank the Reflecting Pool.
- **REFLECTING POOL STRUCTURAL SYSTEM** - The structural system (foundation slab, perimeter grade beam, granite coping, and joint system) would not be altered and would be maintained in accordance with the ongoing Park schedule and budget. Currently, the granite coping is supported on timber piles, and the Reflecting Pool foundation is a slab on grade.

Over time, differential soil settlement and damage to the coping stones and foundation system have allowed outward leakage of water from the Reflecting Pool, inward leakage from groundwater, and water intrusion into the supporting structural elements like the grade beam. As a result, the structural system of the Reflecting Pool has deteriorated. Figures 2.3 and 2.4 depict the structural deficiencies at the Reflecting Pool. Under the no action alternative, this deterioration of the structural system would continue and pervasive water leakage would persist, resulting in a risk of possible structural failure.

- **REFLECTING POOL WATER SYSTEM** – The water system includes water supply, water quality, and discharge. Under the no action alternative, the depth and volume<sup>3</sup> of the Reflecting Pool would remain unchanged. The water supply would continue to be furnished from DC

Figure 2.3 – Reflecting Pool bottom, separated from coping



Figure 2.4 – Deterioration of the joints at the Reflecting Pool granite coping



<sup>2</sup> The Memorandum of Agreement (MOA) for all the Lincoln Memorial Circle security improvements was signed in 2003 without anticipating the need for long-term temporary protection. It was never amended or altered, nor did it allow for long-term temporary protection. In 2007 and 2008, CFA and NCPC agreed to approve the final phase (east plaza) of the Lincoln Security project with temporary barriers in the center section because the NPS promised to actively seek funding to plan and design for the comprehensive rehabilitation of the Reflecting Pool Area. The DC HPO and ACHP were also consulted.

<sup>3</sup> Currently, the Reflecting Pool is approximately 18 inches deep around the perimeter and slopes to a depth of 30 inches in the middle. The estimated water depth is maintained at depth of 12” at the edge and 30” in the middle, yielding a total water volume of approximately 6.5 million gallons (ABE 1987).

WASA, the municipal city water source. To enhance the water quality, the municipal source would continue to be treated with proprietary biological chemicals to abate algae growth. There would continue to be no recirculation and no filtration of the water in the Reflecting Pool.

One to two times annually, the Reflecting Pool would be cleaned. This process involves draining and discharging the volume to the Tidal Basin, scraping and scrubbing the bottom and sides, and removing the solid and organic waste material, which is hauled offsite by truck. This cleaning process takes approximately 10 to 14 days to complete, during which the Reflecting Pool is empty.

The current method of discharge to the Tidal Basin is not in compliance with current Clean Water Act requirements. Under the no action alternative, the discharge water quality of the Lincoln Reflecting Pool would be monitored to ensure water discharge is better than or equal to the quality of the water of the Tidal Basin. The NPS would need to rehabilitate the water system, establish discharge water quality parameters, and monitor the quality of the Reflecting Pool water to comply with District of Columbia and EPA water quality regulations and NPS standards for sustainability.

## **Alternative 2: Rehabilitate Reflecting Pool and Surrounding Area (NPS Preferred)**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area. Specific actions and options at the various locations are described below.

### **ELM WALKS**

There are multiple proposed actions along the elm walks that would affect the site furnishings and pedestrian circulation.

The benches, trash receptacles, and lighting fixtures along the length of both elm walks would be reconfigured and moved to the outboard side of the walkways. The benches and trash receptacles would be rehabilitated or replaced, new permanent lighting fixtures would replace the temporary lighting fixtures, and drinking fountains would be installed at the west end, east end, and center of both elm walks. The lighting fixtures would conform to NPS standards and would be consistent with the scale, character, and historic resources in the surrounding area. To support the drinking fountains, several subsurface lateral water supply lines would be installed at several points along both elm walks. These lateral lines would also service several new irrigation valves that would be installed along each elm walk to accommodate site watering and landscape maintenance.

In addition, the elm walks would be resurfaced in a material that is consistent with the historic character of the cultural landscape and comparable to the adjacent walkways in the project area.

### **LINCOLN MEMORIAL EAST PLAZA**

At the west end of the elm walks, three options (Options A1, A2, and A3) are proposed that would create new ADA/ABAAS-compliant pathways between the Lincoln Memorial east plaza and the lower approachway terrace at the Reflecting Pool. All of these options would integrate a new permanent vehicular barrier system to replace the temporary concrete barriers in the center section of the east plaza. All of these options would follow the same general alignment and would incorporate curvilinear paths that complement the existing character of the landscape and join the existing curvilinear walks that lead to the adjacent Vietnam Veterans Memorial and the Korean War Veterans Memorial. The walkways would avoid the historic fabric of the lower approachway and would minimally intrude on the elm walks.

In addition to the aforementioned features, several other characteristics are common to Options A1, A2, and A3:

Circulation characteristic common to each option:

- The lower approachway staircases, landings, and terrace would be rehabilitated to repair wear and damage and to improve public safety.

Adjacent site modifications common to each option:

- Due to the extent of the proposed security elements, 36 of the existing metal bollards would be removed around Lincoln Memorial Circle, adjacent to the center section of the east plaza.
- The centerline of the Potomac Park Levee (an earthen berm that runs along the north edge of the north elm walkway – see Figure 2.2) would be realigned to accommodate the curved walkway to the north. Realignment of the Potomac Park Levee would require the removal of up to 26 trees.
- One mature tree would be removed and five mature trees would be relocated to fill in the concentric ring of elms that historically flanks Lincoln Memorial Circle.
- To accommodate site watering, landscape maintenance, and cleaning following special events, two irrigation valves would be installed at the east plaza.
- During construction, new conduit would be installed to the Vietnam Veterans and Korean War Veterans kiosks to accommodate future utility needs.

Security characteristics common to each option:

- The concept of a “ha-ha,”<sup>4</sup> or a landscape trench, would be used in each option to reduce the visible portion of the 36-inch-high security walls (Figure 2.5 illustrates this concept). The location of the ha-ha varies in each option, but this concept is common.
- In a similar principle to the ha-ha, the bottom of the west end of the Reflecting Pool would be trenched and incorporated into the vehicular barrier system, thereby eliminating the need for bollards or a security wall to extend across the Reflecting Pool. The trench would not alter the surface of the water.

Figure 2.5 –“Ha-Ha” security trench illustration (location varies in each option)



<sup>4</sup> The ha-ha is a landscape design feature that uses a trench, the inner side of which is vertical, with the outer face sloped and turfed, making the trench, in effect, a sunken fence or retaining wall. The ha-ha is designed not to interrupt the view from a garden or park, and to be invisible until seen from close range.

Despite the previously described features that are common to options A1, A2, and A3, there are several variances in their alignment and perimeter security features. The distinguishing characteristics are described in more detail below.

#### **OPTION A1**

In this symmetrical option (based on the central east/west axis of the Reflecting Pool), a combination of bollards and security walls would be used along the new curvilinear walkways to provide a permanent vehicular barrier system. As shown in Figure 2.6, bollards would be used along the inner path of the walkway along the lower approachway, but security walls would be used along the outer edge of the walkways as they descend to the Reflecting Pool. Along these curved security walls, handrails would be required. At the lower approachway terrace, security walls would align with the western edge of the Reflecting Pool's granite coping. Bollards would be installed between the security walls to complete the vehicular barrier. These bollards would be aligned north to south and would extend across both elm walks and the new walkways that flank the Reflecting Pool.

In the area between the elm walks and new walkways, grade changes would be used to reduce the visible height of the security walls adjacent to the Reflecting Pool.

#### **OPTION A2**

In this symmetrical option (see Figure 2.7), bollards would be used along the entire length of the inner side of the curved walkways. Due to the slope of the walkways, handrails would also be required.

At the lower approachway terrace, grade changes and security walls would be used in the area between the elm walks and the Reflecting Pool to complete the permanent vehicular barrier system. However, unlike Option A1, the trenches and walls are located further to the west within the historic topography and set back from the Reflecting Pool. At the lower approachway terrace, bollards would be installed between the security walls to complete the vehicular barrier. These bollards would be aligned north to south and would extend across both elm walks and the new walkways that flank the Reflecting Pool.

#### **OPTION A3 (NPS PREFERRED OPTION)**

Option A3 is a symmetrical scheme in which the vehicular barrier would be primarily composed of security walls (see Figure 2.8). These new walkways would be universally accessible, with a slope that is less than 5 percent; therefore, no handrails would be required. There is also the potential to install lighting within the security walls to illuminate the walkways at night.

Fewer bollards are in this design option than in options A1 and A2. The perimeter security in this option would be accomplished mainly through security walls with a few bollards transitioning into the curved walkways from the east plaza. The exact proportion of bollards to security walls would be refined through the design process and through the ongoing Section 106 process in which agencies such as NCPC, CFA, and the District of Columbia Office of Historic Preservation (DC HPO) are consulting parties. Bollards would still complete the vehicular barrier across the elm walks and also adjacent to the Reflecting Pool; however, they would be aligned east to west and would therefore be less visible from the views and vistas looking west from the eastern portion of the project area.

At the lower approachway terrace, grade changes would be used to reduce the visible height of the security walls adjacent to the Reflecting Pool. Similar to Option A2, the trenches and walls would be located further to the west within the historic topography and would be set back from the Reflecting Pool.

Figure 2.6 – Option A1 Perspective View and Site Plan Diagram

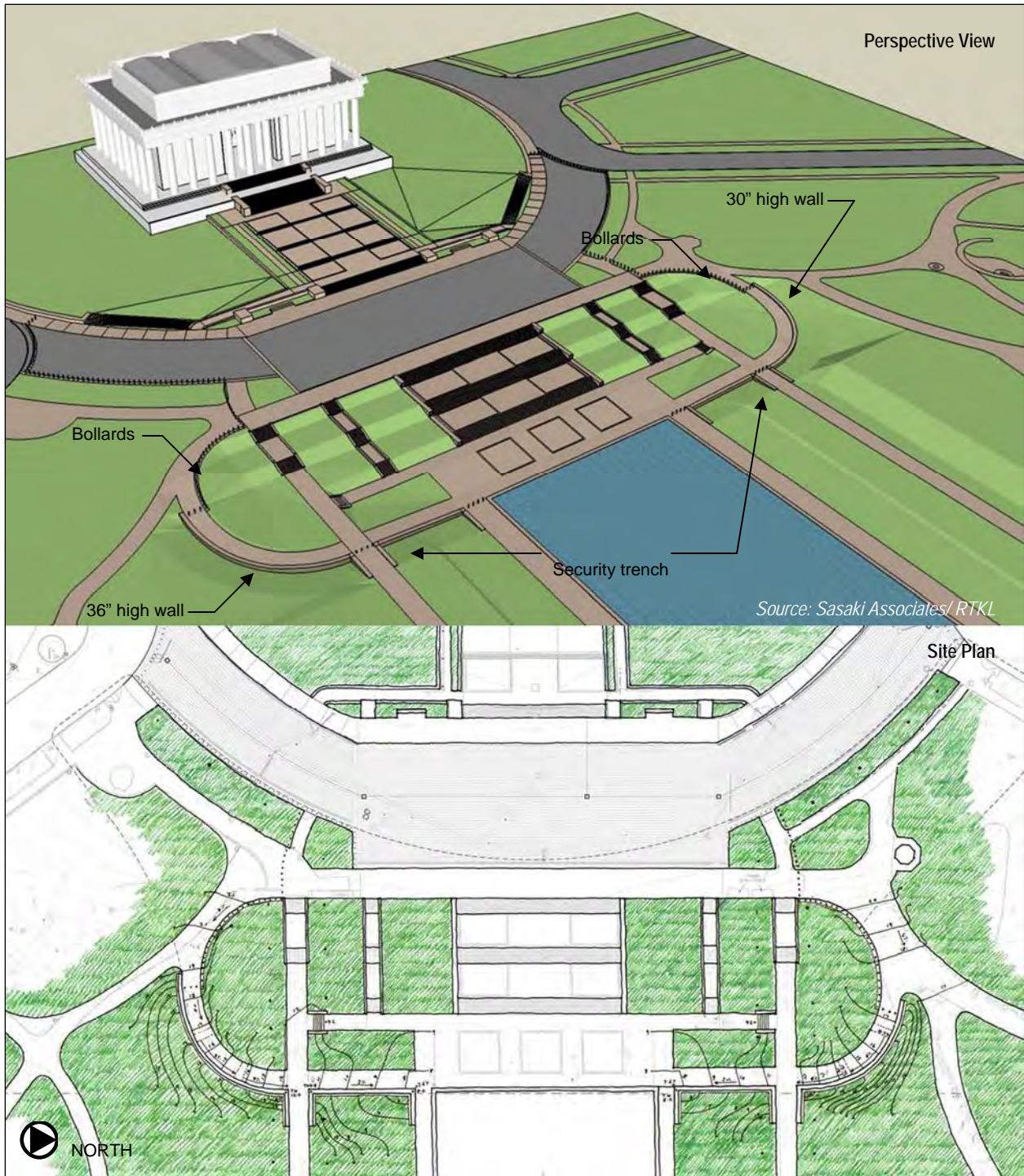


Figure 2.7 – Option A2 Perspective View and Site Plan Diagram

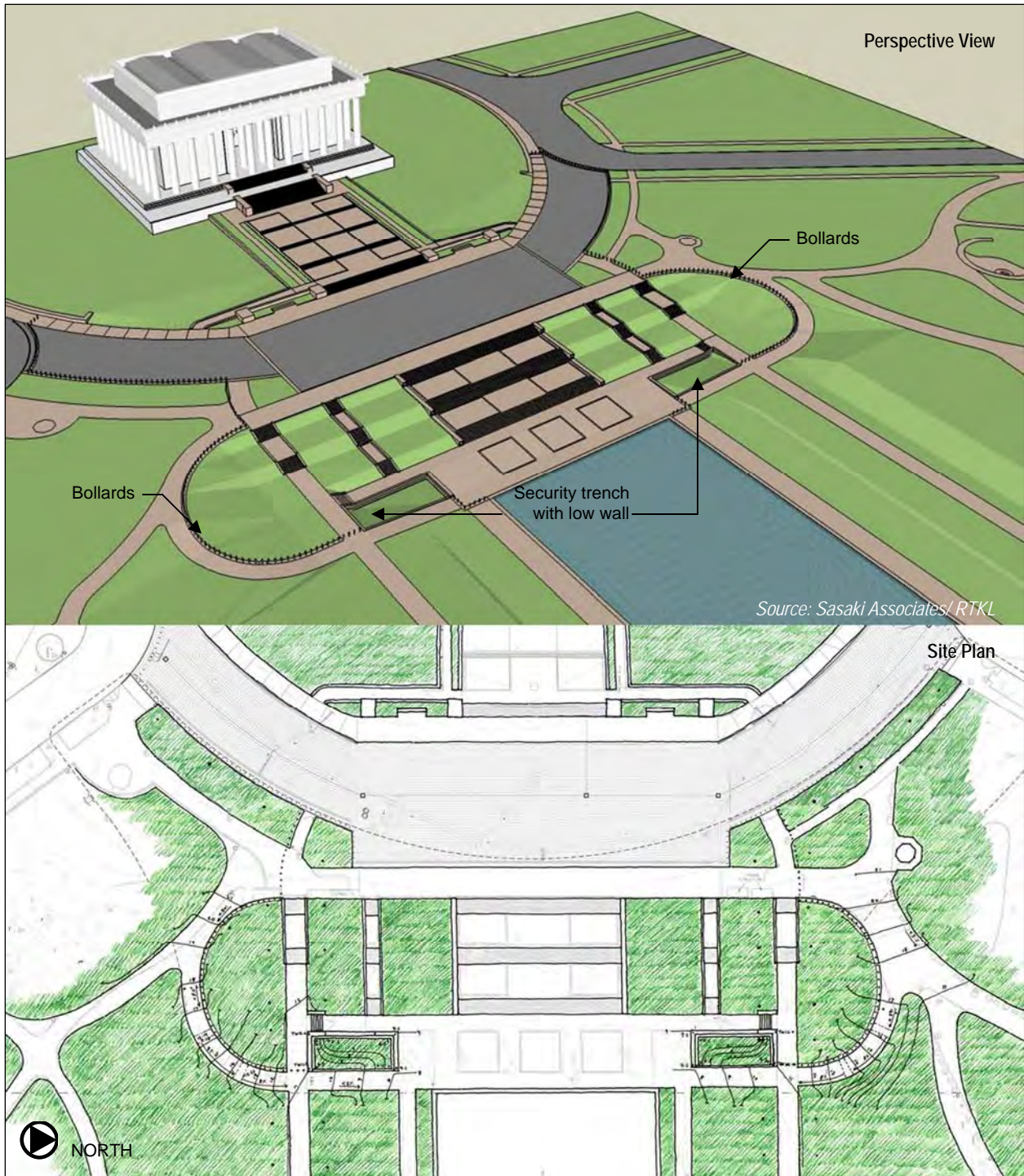
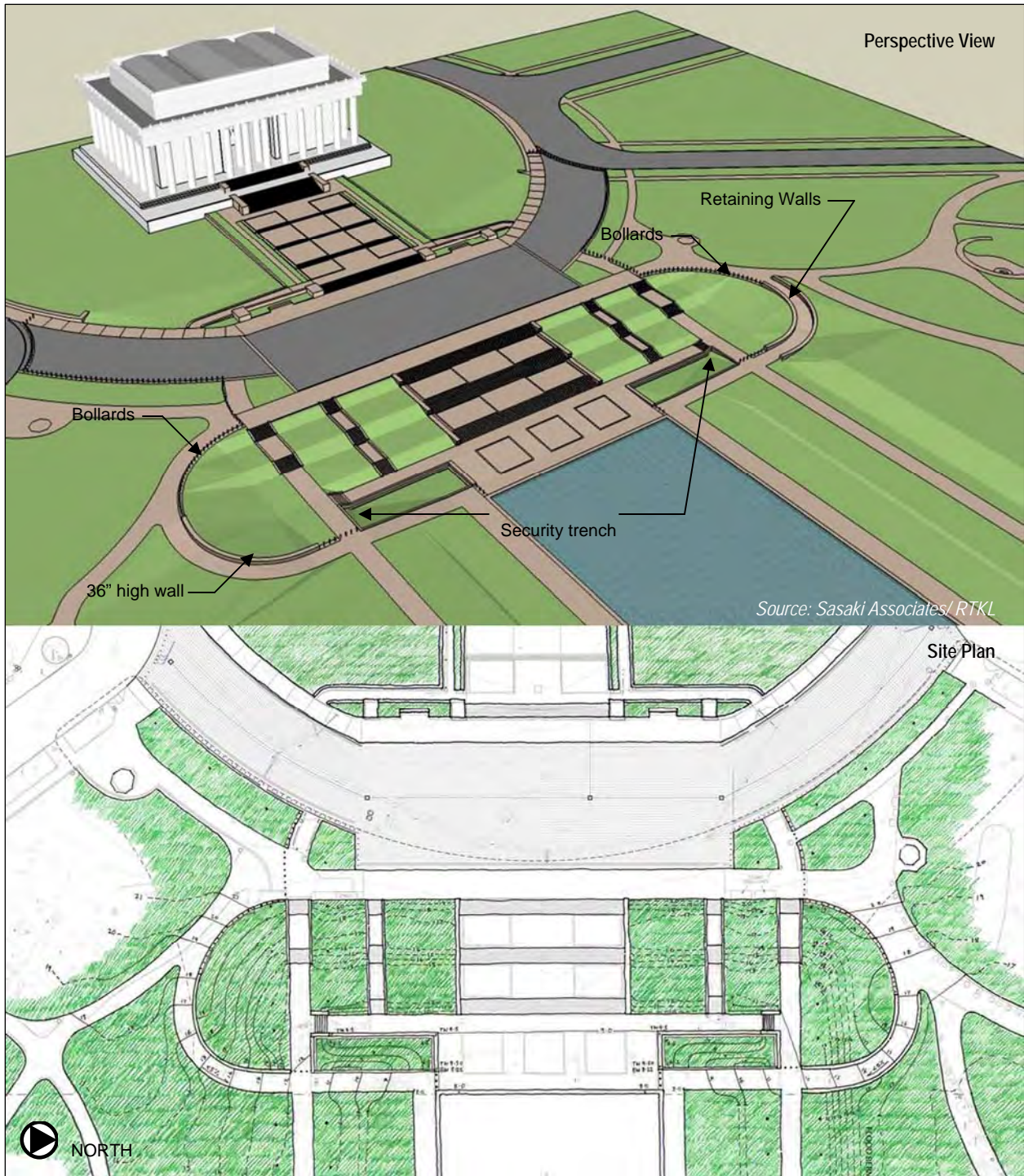


Figure 2.8 – Option A3 Perspective View and Site Plan Diagram





**REFLECTING POOL PEDESTRIAN CIRCULATION SYSTEM**

The existing worn dirt paths, or social trails<sup>5</sup>, that flank the north and south sides of the Reflecting Pool along the granite coping would be resurfaced and made into formal 14 to 16 foot wide walkways, connecting the World War II Memorial and the lower approachway terrace. The material, color, and pattern of the walkways would blend harmoniously with the adjacent historic features (such as the granite coping and lower approachway) and visual character of the project area.

**REFLECTING POOL STRUCTURAL SYSTEM**

At the Reflecting Pool, several modifications are proposed under the action alternative, affecting the structural system and the water resources.

There are three options for improving the structural integrity of the Reflecting Pool.

**OPTION B1**

This option would address only the consequences of the structural deterioration. Cracks and deficiencies in portions of the foundation slab, perimeter grade beam, joints, and granite coping would be repaired in place. Structural reports indicate that approximately 20 percent of the Reflecting Pool structural system requires repair. The repairs would require the drainage of the Reflecting Pool during construction and would take approximately nine months. The timing of construction would be negotiated between the NPS and the contractor, but every attempt would be made to reduce impacts to visitor use in the project area.

**OPTION B2**

In Option B2, the perimeter granite coping would continue to be supported on timber piles, but the foundation slab and grade beam would be removed and replaced. There are two variations for its substructure:

**OPTION B2.1 (NPS PREFERRED OPTION)** – In this option, a grid of new grouted piles would be installed approximately 40 feet downward, beneath the footprint of the Reflecting Pool, creating soil compression and compaction. Next, two inches of crushed aggregate would be installed over the grid and a concrete slab would be poured over the structural system. Finally, the existing granite coping would be reset around the perimeter of the Reflecting Pool. This option would maintain uniform and minimal settlement over the long-term life (100 years) of the Reflecting Pool.

**OPTION B2.2** – In this option, a framed slab and beam system with steel cased piles to bedrock would be installed beneath the footprint of the Reflecting Pool. Next, a concrete slab would be poured over the framed slab and beam system. Finally, the existing granite coping would be reset around the perimeter of the Reflecting Pool. This option would maintain uniform and negligible settlement over the long-term life of the Reflecting Pool.

In both Options B2.1 and B2.2, the structural system of the Reflecting Pool would be completely replaced in multiple steps over the course of an estimated 21-month construction period.

**OPTION B3**

In Option B3, the existing slab and grade beam would be removed and a new structural system would be installed that uses a unified structural system, tying together the foundation slab, grade beam, coping, and adjacent sidewalk. No new piles would be installed. In this option, the entire Reflecting Pool structure and adjacent walkways would be a monolithic concrete system that would settle uniformly, albeit negligibly, over time. In Option B3, the structural system of the Reflecting Pool would be completely replaced in multiple steps over the course of 21 months.

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<sup>5</sup> A social trail is an unofficial trail that diverges from an existing trail, as a shortcut to the destination.

**REFLECTING POOL WATER SYSTEM**

There are three options for improving the efficiency of the water system (supply, quality, and discharge) in the Reflecting Pool.

**OPTION C1 (NPS PREFERRED OPTION)**

In this option, the water supply would be drawn from the Potomac River. It would circulate with a continuous flow through the Reflecting Pool and discharge to the Tidal Basin. Pursuant to the Clean Water Act, the NPS may be required to obtain an NPDES discharge permit for this alternative and will have to ensure that the water quality of the discharge is within permitted parameters. Figure 2.9 delineates the diagram of this option.

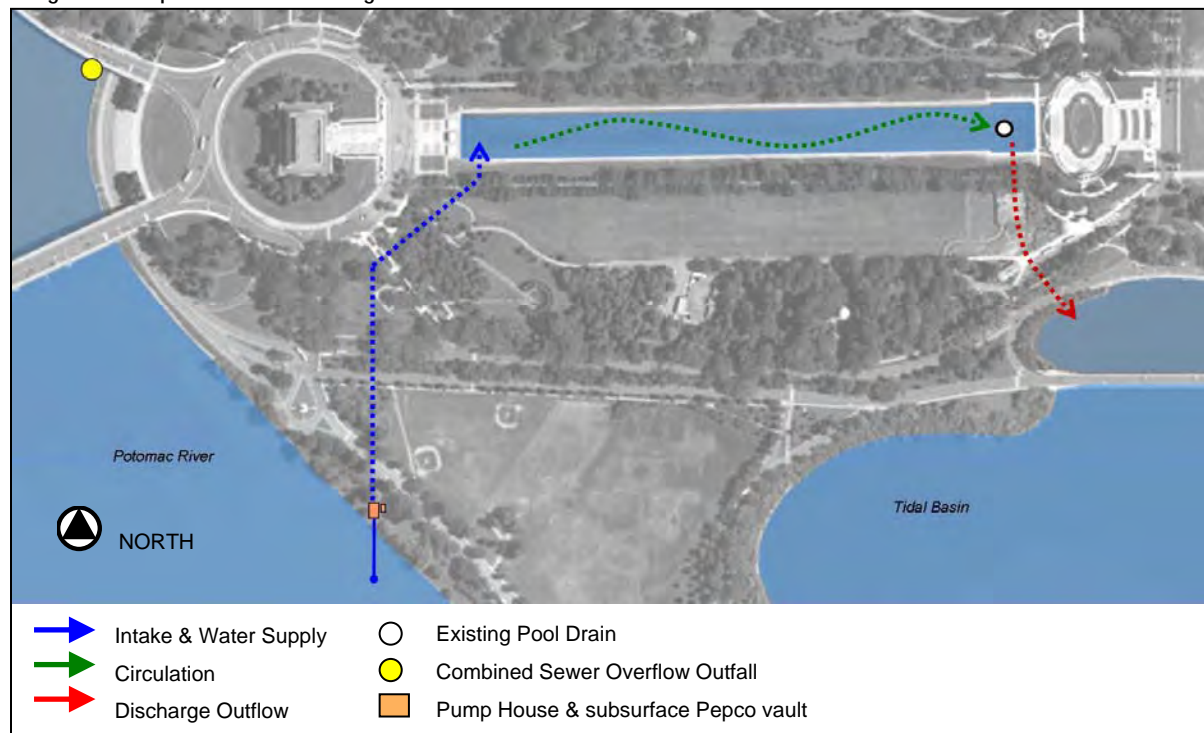
Water Quality

The water would be screened at the point of intake to eliminate suspended solids, sediment, and other large debris from entering the Reflecting Pool. The continuous flow of water would introduce a constant supply of fresh water, and the turnover rate would be optimized to inhibit the accumulation of organic waste and algae growth.

Equipment and Structures Required

The point of intake would be located in West Potomac Park, south of Ohio Drive SW (See Figure 2.9) where a new 15 foot by 15 foot pump station and an 8-foot-by-16-foot subsurface electrical vault would be constructed to accommodate the pumping and screening of the water. The exact location and design of these structures would be refined during the design process and through the ongoing Section 106 process in which agencies such as NCPC, CFA, and the DC HPO are consulting parties. It would be designed to be consistent in style and material with other structures in the surrounding cultural landscapes (Washington Monument Grounds and West Potomac Park). From the Potomac River, a new subsurface 16-inch supply line to the Reflecting Pool would be installed using directional boring methods; it would extend north, across Independence Avenue SW toward the Reflecting Pool, avoiding the Korean War Veterans Memorial. No peak hour road closures would result from the installation of subsurface pipes; during off-peak hours, two lanes of Independence Avenue SW would remain partially open.

Figure 2.9 – Option C1 Site Plan Diagram



**OPTION C2**

In this option, the water supply would be supplied by the municipal system at DC WASA, and it would discharge to the sanitary sewer. Figure 2.10 delineates the diagram of this option.

Water Quality

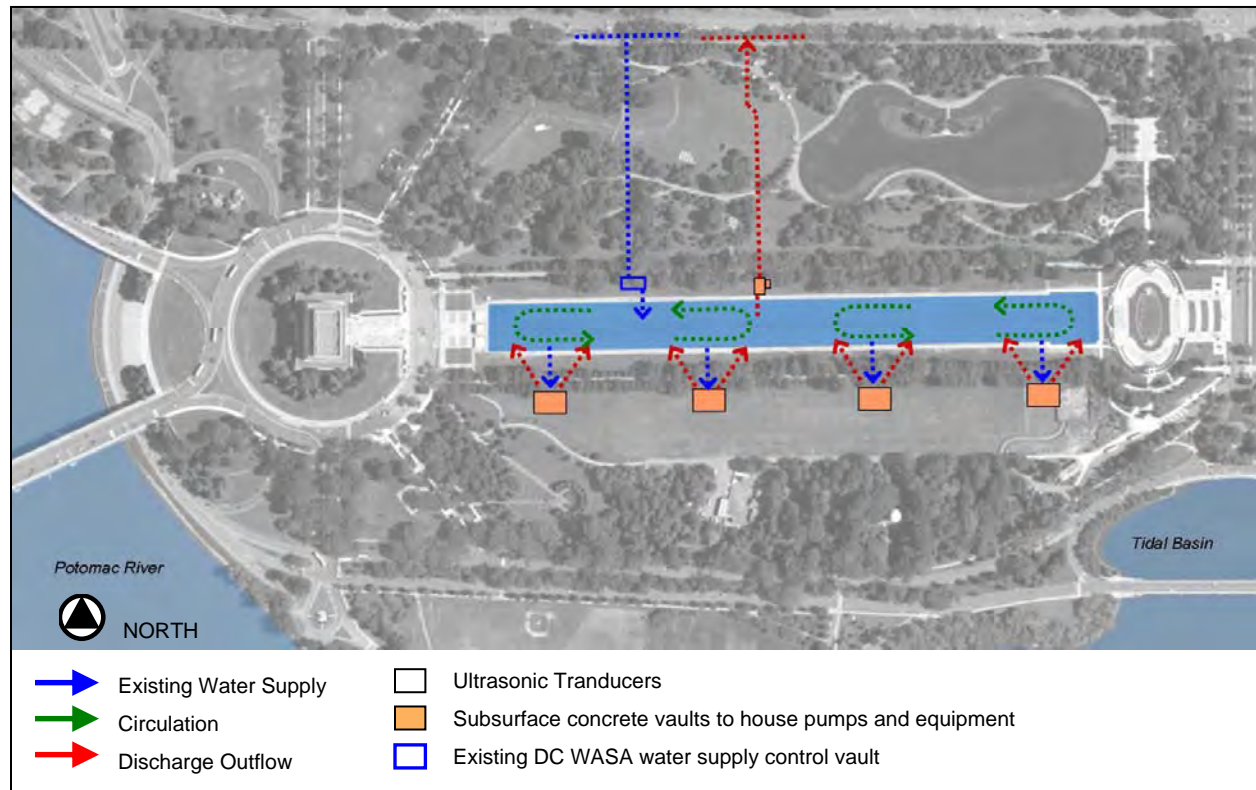
The water would be recirculated in the Reflecting Pool and would undergo ozone filtration prior to entering the Reflecting Pool. To further enhance water quality, inhibit algae growth, and reduce the need for frequent cleaning, six ultrasonic transducers<sup>6</sup> would be installed in the Reflecting Pool below the surface of the water. These devices are small and would not be visible from above.

Equipment and Structures Required

All pumps, filtration equipment, electrical power sources, and water system controls would be located in four subsurface concrete vaults, each measuring 10 feet by 12 feet and located to the south of the southern elm walk.

Since the municipal system is presently used to fill the Reflecting Pool, the infrastructure for water supply is already in place. However, a new 16-inch pipe and an additional subsurface electrical vault would be installed north of the Reflecting Pool through Constitution Gardens to accommodate pumping and discharge to the sanitary sewer system.

Figure 2.10 – Option C2 Site Plan Diagram



<sup>6</sup> These small devices (approximately the size of a soda can) emit a sound frequency that disrupts the cellular growth of algae. The sound is inert to animals and bacteria and does not affect water chemistry.

**OPTION C3**

In this option, the water supply would be drawn from the Tidal Basin, and it would discharge to the Potomac River. Figure 2.11 delineates the diagram of this option.

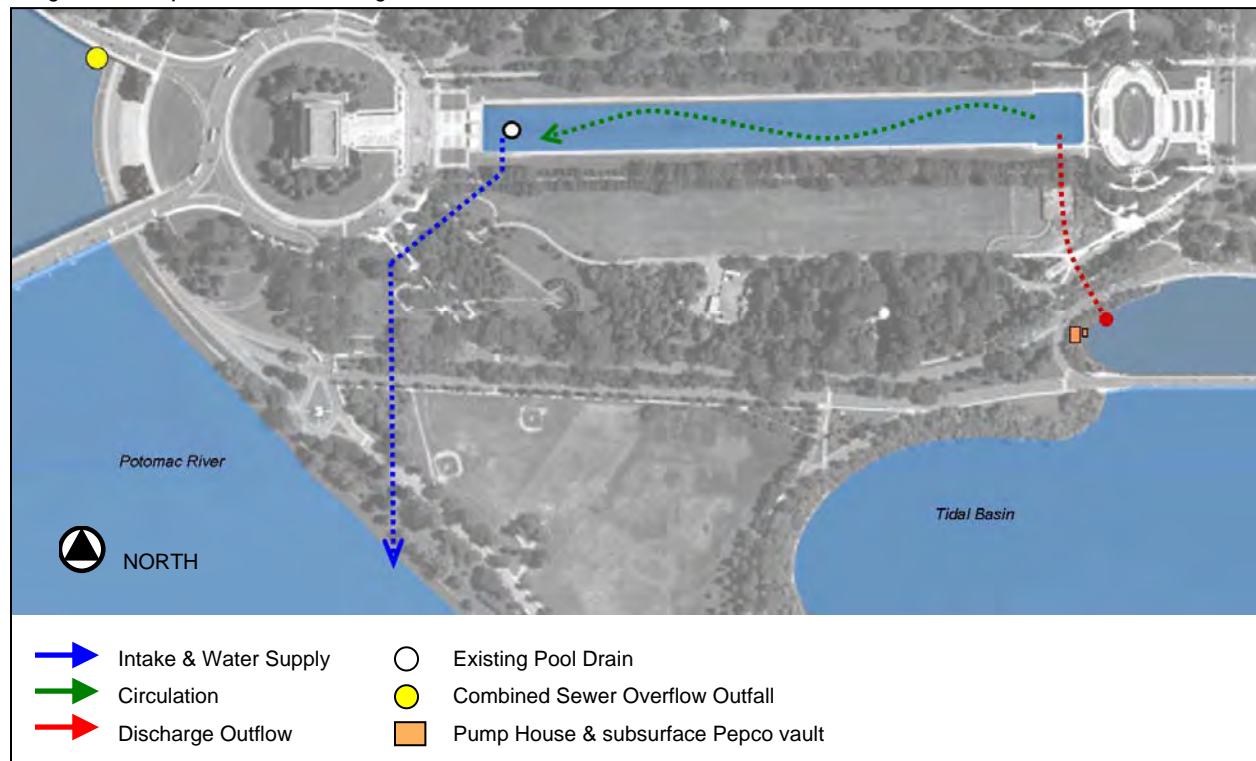
Water Quality

The water would be screened and filtered at the point of intake to eliminate suspended solids, sediment, and other large debris from entering the Reflecting Pool. To further improve water quality, ultrasonic transducers would be used to inhibit algae growth. At the point of intake at the Tidal Basin, less sedimentation would be introduced into the water source, and therefore, less media filtration would be required in this option than in Option C1.

Equipment and Structures Required

The point of intake would be at the northwest corner of the Tidal Basin. At this location, an 8' x 16' subsurface electrical vault and a 15 foot by 15 foot pump station would be constructed to accommodate the pumping and filtration of the water. The exact location and design of the pump station would be determined during the design process and through the ongoing Section 106 process in which agencies such as NCPC, CFA, and the DC HPO are consulting parties, but it would be designed to be consistent in style and material with other structures in the surrounding cultural landscape. The general location would be between the Tidal Basin and Independence Avenue SW. From the Tidal Basin, a new subsurface 16-inch supply line to the Reflecting Pool would be installed using directional boring techniques; it would extend north, across Independence Avenue SW toward the Reflecting Pool. For discharge, a new 16-inch pipe would be installed at the western end of the Reflecting Pool, extending south across Independence Avenue to West Potomac Park. No peak hour road closures would result from the installation of subsurface pipes; during off-peak hours, two lanes of Independence Avenue SW would remain partially open. The exact location of the discharge location at the Potomac River station would be determined during the design process. A general location is shown in Figure 2.11.

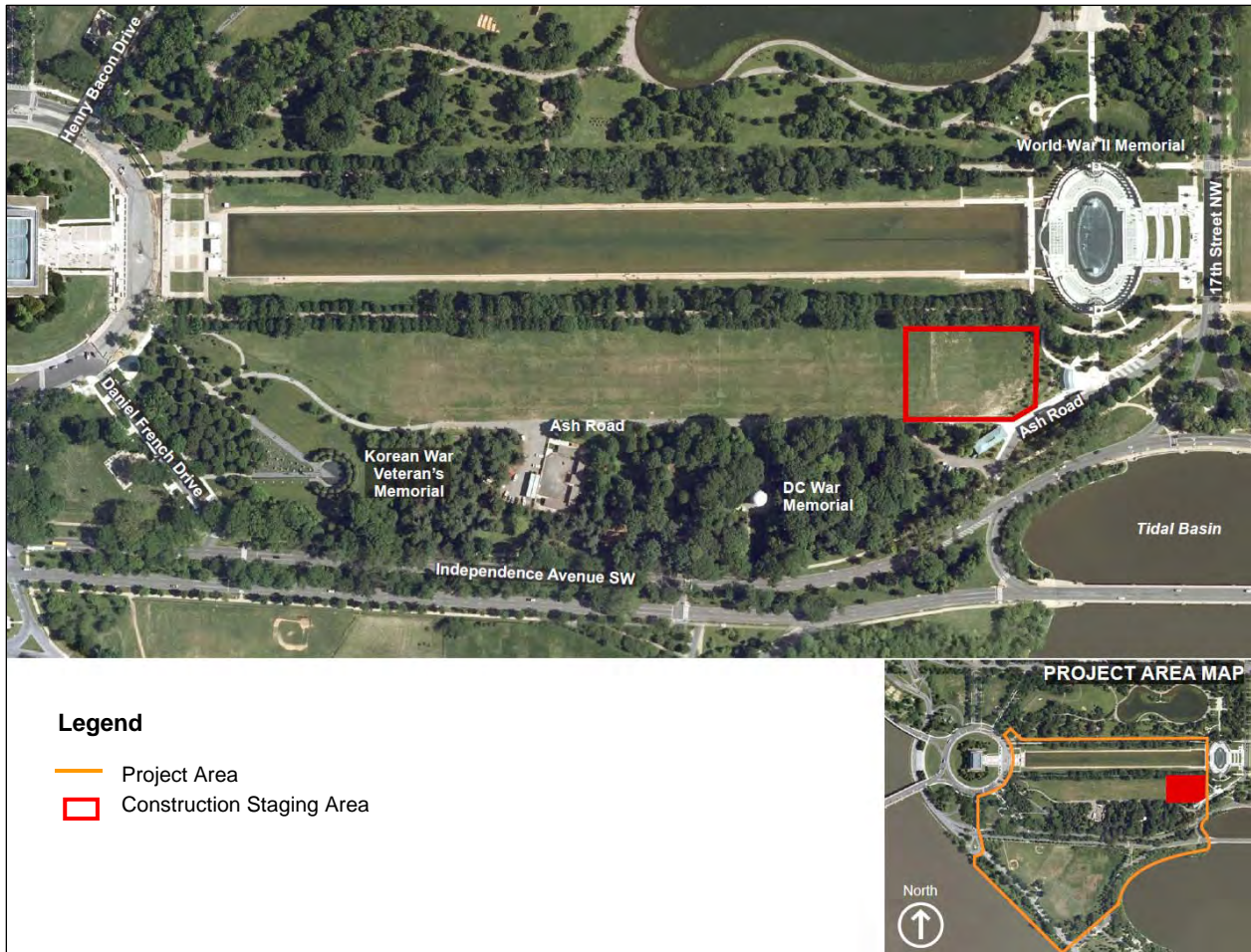
Figure 2.11 – Option C3 Site Plan Diagram



## Construction Staging

The Contractor's primary staging area would be located to the south of the Reflecting Pool off of Ash Road in an area to the southwest of the World War II Memorial currently occupied by recreational fields. Trucks are not allowed to enter the District from the Memorial Bridge to the west of the project area; instead they would use the 14th Street Bridge and access the staging area via Independence Avenue SW. At the staging area, the perimeter would be enclosed with a locked chain link fence supported on temporary concrete blocks. A locked and screened toilet facility for construction workers may be provided in this area.

Figure 2.12 – Construction Staging Area



## **Mitigation Measures Common to All Action Alternatives**

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the following protective measures would be implemented as part of the selected action alternative. The NPS would implement an appropriate level of monitoring throughout the construction process to help ensure that protective measures are being properly implemented and are achieving their intended results.

### **VISITOR USE AND EXPERIENCE**

- Public information will be made available on the Park website and on signs in the Park to inform visitors of temporary closures of portions of or resources within the project area.
- Every attempt will be made to time construction activity so it does not coincide with special events that occur on the National Mall or in the project area.

### **PUBLIC SAFETY**

- Construction workers and employees will follow an approved health and safety plan which incorporates all applicable regulations.
- Barriers and signs will be used around construction sites to divert the public away from potentially dangerous situations.
- Public announcements will be made on the Park website and in the media to alert the public to the construction schedule and locations.

### **CULTURAL RESOURCES**

- Additional interpretation and education appropriate to the historic context of the project and the site will be developed.
- The location and design of the new equipment and small structures required for implementation of water source options will be designed in a way to blend as harmoniously as possible with the existing scale, context, and cultural landscape within the surrounding project area.
- The gaps in the historically significant double concentric row of elms around Lincoln Memorial Circle will be filled with the trees removed during the construction of the new curved walkways.

### **VISUAL/AESTHETICS**

- Ongoing review with regulating agencies within the monumental core (DC HPO, NCPC, and CFA) within the design development and Section 106 process will ensure that the proposed options blend as harmoniously as possible with the existing scale, context, and landscape in the project area.
- Every attempt will be made to time construction activity so it does not coincide with special events that occur on the National Mall or in the project area, thus reducing visual impacts associated with closures of portions of the project area or character-defining resources within it (such as the Reflecting Pool).
- In the construction permit, the NPS will specify screening that will be used to shield equipment during construction. These shields will partially obscure the equipment where appropriate and possible.

### **WATER QUALITY**

- Due to the presence of adjacent combined sewer overflow (CSO) outlets<sup>7</sup>, if the Potomac River is used as a new water source, intakes will be closed during heavy storm events and for a reasonable time afterward to prevent excess bacteria from entering the Reflecting Pool.
- NPS will monitor the water quality in the Reflecting Pool to ensure that the quality of discharged water remains within the parameters of the NPDES permits, if required.
- To mitigate against short-term adverse effects during construction, sediment and erosion control measures will be implemented to prevent sediment runoff into adjacent water bodies or nearby storm sewers.
- To the extent practicable, the NPS will drain the Reflecting Pool for cleaning and inspection during the winter months to reduce the volume of bacteria introduced to adjacent water bodies, which is higher in warmer months.

### **SOILS**

- During construction, exposed soils will be covered with plastic sheeting, jute matting, erosion netting, straw, or other suitable cover material to prevent soil erosion and movement during rain or wind events.
- Erosion containment controls such as silt fencing and sediment traps (e.g., hay bales) will be used to contain sediment onsite.
- Best management practices for erosion and sediment control will be employed during and after construction, including stabilization and re-vegetation after construction is completed.
- Exposed soils will be stabilized and replanted with vegetation as soon as possible following completion of construction activities.
- Decorative post and chains could be used to eliminate the further compaction of soils.

### **VEGETATION**

- Trees removed to accommodate the implementation of proposed actions along the elm walks and east plaza<sup>8</sup> would be relocated, where appropriate, within the project area. One elm would be relocated to a historic position near the Lincoln Memorial Circle, and to the maximum extent possible, the gaps in the historically significant concentric rows of elms around Lincoln Memorial Circle would be filled.
- The NPS will protect the root zones of mature trees within the construction zone by placing fencing around the perimeter of the trees to prevent heavy equipment from compacting the roots or causing damage to the bark.
- Decorative post and chains could be used to reduce further degradation of turf.
- Realignment of the Potomac Park Levee will require the removal of up to 26 trees.

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<sup>7</sup> Approximately one-third of the District is served by combined sewers, a system in which wastewater (such as domestic sewage and industrial wastewater), stormwater, and rainwater runoff are collected and conveyed within the same pipes. CSOs occur during certain storm events when the capacity of the combined sewer system is unable to convey the mixture of wastewater and stormwater to the treatment plant (Berger 2006).

<sup>8</sup> Four Dutch elms (with diameter at breast height [dbh] ranging from five inches to 11 inches) would be removed from the elm walks and one young American elm (four inch dbh) would be removed from an area adjacent to the elm walks to accommodate new paths and security; several understory trees would be relocated from the area near the Korean War Veterans information kiosk.

- If subsurface utility lines need to be installed adjacent to the elm walks, an arborist will be consulted prior to construction.

#### TRANSPORTATION

- There will be no road closures during peak hours. During off-peak hours, two lanes of Independence Avenue SW will remain partially open.
- As part of the construction permitting process, the contractor will submit Traffic Control Plans to the NPS for review and approval prior to the implementation of any changes. The Traffic Control Plans will include measures, such as detour signs, to safely divert traffic during temporary off-peak closures.
- During construction, trucks will deliver materials and remove debris during off-peak hours. The timing will be coordinated with the Park to reduce impacts on traffic and transportation in the project area.

#### Alternatives Considered but Not Carried Forward

Several alternatives or alternative elements were identified during the design process and internal and public scoping. Some of these were determined to be unreasonable, or much less desirable than similar options included in the analysis, and were therefore not carried forward for analysis in this EA. Justification for eliminating alternatives from further analysis was based on factors relating to:

- conflicts with already-established Park uses
- duplication with other less environmentally damaging alternatives
- conflict with the statement of purpose and need, or other policy
- severe impact on environmental or historic resources

#### CIRCULATION OPTIONS

Accessible Paths within the Historic Fabric of the lower approachway: Several preliminary accessibility options were considered in which the accessible paths intruded upon the historically significant lower approachway and elm walks. These options did not adequately avoid or minimize effects to historic resources and were dismissed from further consideration.

Setback of the Worn Dirt Paths from the Coping of the Reflecting Pool (Reinstatement of the Historic Flanking Plan): The millions of visitors to the project area have worn 14 to 16 foot wide dirt paths on the north and south sides of the Reflecting Pool. The NPS proposed to formalize these paths and explored one option to set back the paths approximately 10 to 14 feet from the edge of the granite coping, as per the 1916 historic plan for the area. While this setback would create a beneficial impact to historic resources, it would create an adverse impact to Park maintenance and operations since the space between the coping and new walkways would likely continue to be worn into dirt paths by people walking alongside the water. In addition, the setback of the paths would adversely affect the view from the top of the Washington Monument.

#### SECURITY OPTIONS

Exclusive Use of Bollards for the Vehicular Security Barrier System: Several vehicular barrier concepts explored replacing the existing temporary concrete barriers with permanent bollards. These concepts were not carried forward because they did not conform to NCPC's Urban Design Security Plan that preferences the minimal use of bollards and in lieu of security elements that respect the aesthetic and historic setting of the National Mall. Within the context of this project, bollards are visually undesirable, given the likelihood that they may affect the views and vistas or reflection on the Reflecting Pool's surface.



*Concealment of Security Elements within Vegetative Screens or Planting Bed:* The use of vegetative screens to visually obscure bollards or security walls was dismissed due to potential conflicts between the structural foundations for the security elements and the vegetative substructure required for viable, healthy plant life. It is also considerably more difficult to maintain the size and shape of vegetation to adequately obscure bollards in a visually appealing way.

*Tiger Traps As Vehicular Security Barriers:* The tiger trap system consists of placing material strong enough to hold foot traffic, bicycles, and other common sidewalk traffic as a security perimeter. However, the weight of a vehicle will trigger the surface material to collapse, causing the vehicle to fall into a hole or another material below and stopping the vehicle from breaching the security barrier (NCPC 2002). The use of tiger traps as a vehicular security barrier was considered in several security options but was eliminated from consideration because of potential conflicts with service vehicles and emergency response vehicles.

### **REFLECTING POOL WATER SYSTEM OPTIONS**

*Use of On-site Wells:* Based on the geotechnical analysis, the soil strata onsite cannot support the volume of water required to recharge the Reflecting Pool; therefore, options using on-site wells were dismissed from consideration.

*Rainwater Capture:* Options for collecting and reusing rainwater onsite to recharge the Reflecting Pool were dismissed because the required volume of water would be insufficient to support the Reflecting Pool. In addition, the required storage receptacle was too large to accommodate onsite.

*River Intake and Sanitary Discharge:* The option that explored water supply drawn from the Potomac River and discharged to the sanitary sewer was dismissed because it was comparable in efficiency to the other options but was more costly. In addition, this option required considerably more piping and equipment than the other options, which presented an increased maintenance and operational cost.

*River Intake at a Location Northwest of the Lincoln Memorial:* A point of intake to the northwest of the Lincoln Memorial would place an above-ground pump station in a more visible location than West Potomac Park. In addition, it would require the installation of a new water supply line to the Reflecting Pool to circumvent the Lincoln Memorial, which presented logistical challenges.

### **REFLECTING POOL STRUCTURAL SYSTEM OPTIONS**

*Use of a Membrane Liner over the Existing Pool Slab:* It is likely that a pool liner would be subject to the same cracking and tearing as the substrate below it. Therefore, this method of abating water leakage was dismissed from further consideration.

*Pouring a New Slab over the Existing Slab:* It is likely that repairing the existing slab and adding a concrete overlay would propagate new cracks similar to the existing slab beneath. Therefore, this method of Reflecting Pool rehabilitation was dismissed from further consideration.

## **The Preferred Alternative**

The Council on Environmental Quality (CEQ) Section 5.4 (d) requires the Park to identify a preferred alternative in the EA if one has been identified. The preferred alternative is the alternative the NPS believes would best accomplish its goals, objectives, and purpose and need. In selecting a preferred alternative, the NPS must consider the associated impacts to natural and cultural resources. Since there is no requirement that the environmentally preferable alternative and the preferred alternative be the same, the NPS chose the action alternative with the following options as its preferred alternative because it best meets the objectives of the project and it is consistent with NPS management policies, laws, regulations, and plans:

**OPTIONS A3** – This symmetrical scheme uses the least number of bollards and primarily uses security walls along curved walkways to provide perimeter security and new accessible paths between the Reflecting Pool and the Lincoln Memorial east plaza. Adjacent to the lower approachway terrace, grade changes would be used to reduce the visible height of the security walls adjacent to the Reflecting Pool; these grade changes would be located further to the west within the historic topography and would be set back from the Reflecting Pool.

**OPTION B2.1** – In this option, the existing slab, grade beam, and deep foundation piles would be removed and a new structural system would be installed that uses a foundation slab and deep foundation piles. The granite coping would be removed and stored onsite for reuse. This option would maintain uniform and minimal settlement over the long-term life (100 years) of the Reflecting Pool.

**OPTION C1** – In this option, the water supply would be drawn from the Potomac River. It would circulate with a continuous flow through the Reflecting Pool and discharge to the Tidal Basin. The NPS would be required to obtain an NPDES discharge permit for this alternative and would have to ensure the water quality of the discharge is within permitted parameters. Figure 2.9 delineates the diagram of this option.

The process by which the NPS identified their preferred alternative involved a Choosing by Advantages and Value Analysis (CBA/VA) Workshop which was held in two parts. The first workshop took place July 28, 29, and 30, 2009, and the second workshop was held September 2, 3, and 4, 2009.

The CBA/VA was conducted to ensure that all viable project alternatives were considered, the evaluation criteria was sound, the selected solutions were cost effective, an independent opinion was provided, and all proposed project alternatives would satisfy basic project objectives. These objectives include:

- Prevent loss of Park Resources
- Improve the Condition of Park Resources
- Improve and Enhance Visitor Experience
- Increase Operational Efficiency and Sustainability
- Provide Environmentally Responsible Alternatives

The study team included a mix of professional designers NPS staff, and independent consultants with design, security, operations, and maintenance experience.

Generally, alternatives were evaluated in two stages; an initial, judgment level screening against pre-selected evaluation factors and a final, more rigorous evaluation using the Choosing by Advantages method. The top alternatives surviving these procedures were identified. The top-ranked of these was further developed, taking some aspects from other alternatives, into the recommended solution, and a Class “B” construction cost estimate was prepared.

The Value Analysis process was structured into seven phases to determine a preferred alternative:

1. Information Phase - Understand the question and the context
2. Functional Analysis Phase - Evaluate basic functional needs
3. Creativity Phase - Team develops alternatives to achieving project functions
4. Evaluation Phase - Evaluate alternatives with criteria, including life-cycle costs.
5. Development Phase - Develop the best alternatives.
6. Recommendation/Presentation Phase - Recommend the best alternatives
7. Implementation Phase - Plan how to make the changes and adjustments

Ultimately, the NPS evaluated qualitative and quantitative advantages of each option across a variety of resources for the Reflecting Pool structural rehabilitation, accessibility/security improvements, and water supply options and selected the preferred options that would be carried forward for further analysis.

The NPS chose the action alternative, selecting Options A3, B2.1, and C1, as its preferred alternative because it best meets the objectives of the project and is consistent with NPS management policies, laws, regulations, These options also offer strategies that best improve the efficiency of Park management and operations, enhance visitor use and public safety, and preserve cultural, natural, and visual resources in the project area, as described in more detail below.

#### **EAST PLAZA**

Option A3 would improve the configuration of site furnishings and would add new permanent lighting fixtures, irrigation valves, and drinking fountains, all of which would enhance visitor use and experience and Park management and operations in the project area. In addition, a new walking surface and the new permanent lighting fixtures would enhance public safety.

Option A3 provides a landscape design solution that harmoniously extends into the existing adjacent landscape areas to the north and the south, avoiding adverse impacts to the historic fabric of the project area. This option maintains the historic topography adjacent to the lower approachway and results in a net loss of bollards in the project area. The few bollards that complete the vehicular barrier adjacent to the Reflecting Pool would be orientated to reduce their visibility from views looking west. As a result, this option best fits within the historic design context and works with the character-defining features of the cultural landscape.

From a Park management perspective, this option would eliminate the maintenance costs associated with bollards and would provide a public amenity as the low walls can be used for seating. In addition, bollards adjacent to the Reflecting Pool would not inhibit maneuverability of service vehicles to access the area as they would in Options A1 and A2.

#### **REFLECTING POOL STRUCTURAL SYSTEM**

Option B2.1 is the preferred option since it presents the most efficient and cost-effective long-term solution for improving and protecting the Reflecting Pool. This option would result in the optimal solution for fixing the current water leakage while providing a structural solution with minimal settlement over the next 100 years. Structural upgrades to the Reflecting Pool would preserve the integrity of this asset, which is listed on the NRHP.

#### **REFLECTING POOL WATER SYSTEM**

Option C1 provides the most environmentally sustainable strategy for filling, cleaning, and discharging the Reflecting Pool for several reasons. By using the Potomac River to fill the Reflecting Pool, the dependency on municipal systems would be eliminated. In addition, the Potomac River, unlike the Tidal Basin, is categorized as an impaired water body under Section 303 of the CWA and does not meet the criteria for Class A waters, the threshold established for primary contact recreation. As a result, the quality of the water intake would be better.

The continuous recirculation would naturally and regularly maintain the quality of the water, reducing the dependency on chemicals to enhance the water quality. The physical improvements to the Reflecting Pool would improve the efficiency of the water source and water quality, preserving the integrity of this asset, which is listed on the NRHP.

## The Environmentally Preferable Alternative

The environmentally preferred alternative is defined by CEQ as the alternative that would promote the national environmental policy as expressed in NEPA Section 101. This includes:

1. Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assuring for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieving a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and
6. Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA, Section 101).

The NPS is required to identify the environmentally preferred alternative in its NEPA documents for public review and comment. The NPS, in accordance with the Department of the Interior policies contained in the Departmental Manual (516 DM 4.10) and the Council on Environmental Quality's (CEQ) NEPA's Forty Most Asked Questions, defines the environmentally preferred alternative (or alternatives) as the alternative that best promotes the national environmental policy expressed in NEPA (Section 101(b) (516 DM 4.10). In their Forty Most Asked Questions, CEQ further clarifies the identification of the environmentally preferred alternative, stating "Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" (CEQ, nd).

Based on the analysis of environmental consequences of each alternative, the NPS determined that the action alternative, with Options A3, B2.1, and C1, is the environmentally preferable alternative.

Option A3 would best preserve the historic resources in the project area as it best maintains the integrity of the character-defining features of the cultural landscape, such as the viewsheds and vistas, historic topography, and historic lower approachway stairs and landings. All options—A1, A2, and A3—have similar effects on natural resources such as vegetation and soils.

Option B2 would best protect the natural and historic resources in the project area. A comprehensive repair of the Reflecting Pool would restore the structural integrity of this important historic resource, protecting its longevity. In addition, the addition of formalized walking paths would protect the vegetation (turf) and soils in the project area from further degradation.

Option C1 is the environmentally preferable alternative for the same reasons listed in the preferred alternative.

Implementation of these options is preferable over the no action alternative because they best preserve the existing historic features in the project area and enhance visitor use and experience, and public safety, and park management and operations.

## How the Alternatives Meet the Objectives

The project objectives, enumerated in Chapter 1, must be achieved to a large degree for the action to be considered a success. The alternatives and options selected for detailed analysis must resolve the purpose of and need for action and meet all objectives either minimally, partially, or fully.

Table 2.2 – How the Alternatives meet the Project Objectives

Objective	No Action Alternative	Action Alternative
<p>Rehabilitate the cultural landscape associated with the project area in a manner that respects the resources and values of the NPS and the National Mall.</p>	<p>Does not meet this objective.</p> <p>Currently, the deficiencies in the project area (uneven and irregular walking surfaces, non-ADA/ABAAS-compliant paths, social trails, structural flaws in the Reflecting Pool, etc.) compromise the historic character of the cultural landscape and natural resources in the project area, which affects visitor use and public safety.</p>	<p>Fully meets this objective.</p> <ul style="list-style-type: none"> <li>▪ The new circulation site options between the east plaza and lower approachway terrace would introduce new features into the cultural landscape, but their alignment would avoid the historic fabric of the lower approachway and would minimally intrude on the elm walks. The formalization of the worn dirt paths would eliminate the visual intrusions to the grand vista along the Reflecting Pool, restoring the prominence of the views.</li> <li>▪ Reconfiguring the site furnishings along the historic elm walks and consolidating the benches, trash receptacles, and light fixtures to the outboard side of the walkways would enhance the historic prominence of these walkways. Installing a new walkway surface would have no effect on the historic quality of the elm walks.</li> <li>▪ The physical improvements to the Reflecting Pool would improve the water quality and preserve the structural integrity of this historic feature within the cultural landscape.</li> </ul>
<p>Implement improvements to the architectural features, structures, and systems in the project area that improve their efficiency and maintain their consistency with the historic character of the project area.</p>	<p>Does not meet this objective.</p> <p>Currently, the Reflecting Pool's structural system is compromised, resulting in separation in the granite coping and joints and in excessive water leakage. The lower approachway structures, elm walk site furnishings, and walking surfaces suffer from the effects of overuse.</p>	<p>Fully meets this objective</p> <ul style="list-style-type: none"> <li>▪ The lower approachway staircases, landings, and terrace would be rehabilitated to repair wear and damage and to improve public safety, restoring the integrity of this historic feature.</li> <li>▪ Upgrades to the elm walks and worn dirt paths that flank the Reflecting Pool would enhance the quality of the historic resources in the project area.</li> <li>▪ The physical improvements to the Reflecting Pool would improve the efficiency of the water source and water quality; structural upgrades would preserve the integrity of this asset, which is listed on the NRHP.</li> </ul>
<p>Enhance the pedestrian circulation systems in the project area to ensure their accessibility and responsiveness to historic vistas.</p>	<p>Does not meet this objective.</p> <p>The steep slopes at the western end of the elm walks are not compliant with NPS' legal and ethical responsibility for safe and universally accessible sites for all visitors. The walking surfaces along the elm walks and the Reflecting Pool are uneven and irregular, presenting challenges to full accessibility in the project area. These worn dirt paths also detract from the historic vista along the Reflecting Pool.</p>	<p>Fully meets this objective</p> <ul style="list-style-type: none"> <li>▪ The new circulation site options between the east plaza and lower approachway terrace would be fully accessible. Repaving the elm walks and formalizing the worn dirt paths would result in fully accessible walking surfaces in the project area; deficiencies would no longer detract from the historic vistas.</li> <li>▪ Implementation of any water system option at the Reflecting Pool would have no effect on the appearance of the Reflecting Pool or surface of the water and would not affect the historic vistas.</li> </ul>

Objective	No Action Alternative	Action Alternative
<p>Provide for the security of visitors and staff at the Lincoln Memorial in a manner that is consistent with the historic and visual character of the surrounding project area.</p>	<p>Does not meet this objective.</p> <p>The current walkways are uneven and irregular, creating tripping hazards for visitors. In addition, the existing temporary concrete barriers are inconsistent with the historic character of the project area.</p>	<p>Fully meets this objective</p> <ul style="list-style-type: none"> <li>▪ Along the elm walks and to the north and south of the Reflecting Pool, a new walking surface would eliminate current tripping hazards.</li> <li>▪ New permanent lighting fixtures would enhance visitor nighttime safety.</li> <li>▪ A new network of accessible paths and perimeter security elements would provide a secure vehicular barrier that complements the existing landscape and is consistent with the historic design context.</li> </ul>
<p>Avoid or minimize adverse impacts on the cultural landscapes, historic structures, and other cultural resources of the National Mall and the project area.</p>	<p>Does not meet this objective.</p> <p>Several deficiencies in the project area detract from the historic character of the cultural landscape: the lower approachway is deteriorating, the walking surfaces are irregular, and the worn dirt paths compromise the vista along the Reflecting Pool.</p>	<p>Fully meets this objective.</p> <ul style="list-style-type: none"> <li>▪ The new circulation site options between the east plaza and lower approachway terrace would avoid the historic fabric of the lower approachway and minimally intrude on the elm walks.</li> <li>▪ The action alternative would enable 36 bollards around the Lincoln Memorial Circle to be removed and potentially reused elsewhere in or around the project area.</li> <li>▪ The rehabilitation of the lower approachway stairs and landings would restore their historic integrity.</li> <li>▪ The physical improvements to the Reflecting Pool would preserve the integrity of this prominent historic resource. The formalization of the worn dirt paths would restore the integrity of the grand vista along the Reflecting Pool.</li> </ul>
<p>Avoid or minimize adverse impacts on the viewsheds and the visual quality of the project area.</p>	<p>Does not meet this objective.</p> <p>Deficiencies in the project area detract from the visual character of the project area: the temporary concrete barriers are visually inconsistent and the worn dirt paths compromise the vista along the Reflecting Pool.</p>	<p>The proposed actions along the elm walks and the Reflecting Pool fully meet this objective.</p> <ul style="list-style-type: none"> <li>▪ The formalization of the worn dirt paths would restore the integrity of the grand vista along the Reflecting Pool.</li> <li>▪ The physical improvements to the Reflecting Pool would have no adverse effect since the visual quality of the pool would not be altered.</li> </ul> <p>The site circulation options meet this objective in varying degrees and are described below. In all options, the landscape solutions would blend more harmoniously into the landscape than the existing temporary concrete barriers.</p> <ul style="list-style-type: none"> <li>▪ Option A1 partially meets this objective since there would be new bollards placed across the elm walks and adjacent to the Reflecting Pool, creating a visual intrusion to the vista along the Reflecting Pool.</li> <li>▪ Option A2 minimally meets this objective since there would be multiple new bollards introduced to the project area, including new bollards placed across the elm walks and adjacent to the Reflecting Pool, creating a visual intrusion to the vista along the Reflecting Pool.</li> <li>▪ Option A3 fully meets this objective because of the relatively few new bollards introduced to the project area. The bollards adjacent to the Reflecting Pool are aligned east to west, reducing their visibility from the east.</li> </ul>

Objective	No Action Alternative	Action Alternative
<p>Implement improvements that maximize Park efficiency, operations, and maintenance.</p>	<p>Does not meet this objective.</p> <p>The existing deficiencies in the project area result in inefficiencies to Park management and operations since they require more frequent maintenance. The Reflecting Pool's structural system is compromised, resulting in excessive water leakage, which represents a tremendous inefficiency and expense.</p>	<p>Fully meets this objective</p> <ul style="list-style-type: none"> <li>▪ The reconfiguration of the site furnishings would reduce the need for continued maintenance along the elm walks.</li> <li>▪ New walking surfaces on the elm walks and adjacent to the Reflecting Pool would improve Park maintenance since the current paths have numerous deficiencies that require continual maintenance.</li> <li>▪ The enhancement of walking surfaces would reduce the current tripping hazards and improve Park operations.</li> <li>▪ The conduit installed to accommodate future utility enhancement to the information kiosks would provide for future expansion of electrical service.</li> <li>▪ The installation of irrigation valves would enhance the maintenance operations within the Park.</li> <li>▪ The Reflecting Pool structural system would be repaired, reducing leakage. The efficiency of the water system and the water quality would be improved.</li> </ul>

## Summary of Impacts

The table on the following pages provides a summary of environmental consequences for each resource area analyzed in Chapter 4. There would be no impairment to any of the resources resulting from the implementation of the action alternative.

Table 2.3 – Summary of Impacts (Environmental Consequences)

Resource Area	No Action Alternative	Action Alternative				Cumulative Impacts
		Elm Walks	Site Circulation	Structural System	Water System	
<b>Visitor Use</b>	At the elm walks, there would be long-term minor adverse impacts to visitor use due to the aging condition of the site furnishings, insufficient nighttime lighting, and irregular walking surfaces. At the east plaza and lower approachway, there would also be long-term minor to moderate adverse impacts resulting from the lack of accessible paths. At the Reflecting Pool, there would be short-term moderate and long-term, minor adverse impacts resulting from the worn dirt paths and cleaning and inspection of the Reflecting Pool. Cumulative impacts would be long-term and beneficial; there would be short-term minor adverse cumulative effects resulting from other construction projects in the study area.	There would be long-term beneficial impacts along the elm walks resulting from the new reconfiguration and restoration of site furnishings and improved walkway surfaces. There would, however, be short-term minor adverse impacts during construction.	The Lincoln Memorial east plaza Options A1 and A3 would have long-term beneficial impacts as a result of new accessible pathways that create additional seating opportunities and provide adequate perimeter security to the area. Option A2 would introduce additional bollards to the project area, resulting in long-term minor adverse impacts to visitor experience. All three options would result in short-term moderate adverse impacts to visitor use during the construction of the new accessibility walkways.  At the Reflecting Pool, there would be long-term beneficial impacts due to replacing the current uneven worn dirt paths and improving the safety and visitor experience for the millions of visitors who travel between the World War II Memorial and the Lincoln Memorial. However, there would be short-term minor adverse impacts during construction.	The Reflecting Pool structural system would have long-term negligible impacts to visitor use after construction is completed. However, during construction, Option B1 would result in short-term moderate adverse impacts and Options B2 and B3 would result in long-term moderate adverse impacts to visitor use.	The Reflecting Pool water system Options C1 and C3 would have long-term minor adverse impacts on visitor use after construction has been completed, primarily due to the presence of the new pump stations in West Potomac Park. There would be short-term moderate adverse impacts during the once to twice annual cleaning and inspection. These options would have short-term minor adverse impacts as a result of the installation of the subsurface pipes connecting the new water systems. Option C2 would have long-term negligible adverse impacts, resulting from the ultrasonic transducers and subsurface concrete vaults, which would not have a detectable impact to visitors. Option C2 would have short-term minor adverse impacts as a result of the installation of a subsurface pipe, ultrasonic transducers, and subsurface concrete vaults.	Cumulative impacts would range from long-term beneficial resulting from increased visitor opportunities to short-term minor and negligible adverse impacts resulting from ongoing construction and closures of certain areas. The effects of these actions, added to the long-term benefits resulting from overall site improvement, would result in long-term overall beneficial impacts on visitor use and experience in the project area and its surroundings.
<b>Public Safety</b>	Under the no action alternative, there would be long-term minor impacts on public safety due to the possibilities of accidents or injuries occurring throughout the project area as a result of uneven walking surfaces or non-ADA/ABAAS-compliant walkways. Cumulative impacts would be long-term and minor, with most of the adverse effects stemming from the existing condition of the irregular walking surfaces throughout the project area and non-ADA/ABAAS-compliant walkways.	A permanent lighting system, new walking surfaces, and reconfigured site furnishings would facilitate the comfort and enhance the safety of the large number of visitors who walk at all times of the day between the Lincoln Memorial and the World War II Memorial. These changes and additions would result in a long-term beneficial impact on public safety in the project area.	Options A1, A2, and A3 would all have a long-term beneficial effect since each would provide safe and accessible paths to the Lincoln Memorial Reflecting Pool, ensuring compliance with the NPS policy for universal accessibility. Each option provides for a secure vehicular barrier system that would enhance the protection of the Lincoln Memorial. The differences between the options, primarily the ratio of bollards to security walls, result in the same effects to public safety since there are no appreciable differences in safety between bollards and security walls.  The surfacing of the worn dirt paths that flank the Reflecting Pool would eliminate tripping hazards and would provide an accessible surface for visitors walking between the two memorials, resulting in a long-term beneficial impact to public safety.  There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the project area.	Options B1, B2, and B3 would result in the same long-term beneficial impacts to public safety because they all result in adequate repair and rehabilitation of the structural system and granite coping around the Reflecting Pool. There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the Reflecting Pool.	Options C1, C2, and C3 vary in their approaches to modifying the supply, filtration, treatment, and discharge of the water system at the Reflecting Pool. However, in terms of public safety, all options have the same beneficial long-term effect because the resultant water quality in each proposed option would be enhanced from the current condition; the water would be maintained at a suitable level for human exposure and would be and treated and filtered to eliminate health risks associated with waterborne diseases. The NPDES permitting process would ensure that the water quality in the Reflecting Pool, as well the water quality in adjacent water bodies (into which the Reflecting Pool discharges), is maintained at a level that will not harm the public.	Cumulative impacts would range from long-term beneficial, related to increased security and walking surfaces, to minor adverse impacts from visitor injuries and possible construction-related incidents. The effects of these actions, added to the long-term benefits resulting from overall improvements to the project area and the short-term minor to possibly moderate adverse effects related to construction, would result in long-term overall beneficial impacts on public safety in the project area and its surroundings.



Resource Area	No Action Alternative	Action Alternative				
		Elm Walks	Site Circulation	Structural System	Water System	Cumulative Impacts
<b>Park Management and Operations</b>	Due to the number of visitors to the site, the pedestrian circulation systems and site furnishings suffer from overuse and require continued maintenance resulting in long-term minor adverse impacts. The persistent water leakage, structural deficiencies, and other functional inefficiencies result in long-term moderate adverse impacts for Park operations and management to maintain an adequate level of project area resources. Overall, cumulative impacts would be long-term, adverse, and minor.	The proposed actions would have a net long-term beneficial impact on Park management and operations since, over time, the cost and level of effort to maintain the site furnishings and walkways would diminish as they would not require the intensity of annual maintenance that currently exists.	Option A1, A2, and A3 do not vary substantially in degree or extent of effect on Park management and operations relative to each other since the cost of maintaining bollards versus security walls is comparable. These options all represent a long-term moderate adverse impact to Park management and operations in this particular location of the project area because the new curved walkways would require additional maintenance by Park resources (staffing and funding) over and above what presently exists. At the Reflecting Pool, the new paths would introduce an additional demand on Park maintenance since the pavement will need maintenance, particularly in the winter months, resulting in a negligible long-term minor adverse impact.	Of the options to repair the structural system of the Reflecting Pool, only Option B1 represents an adverse impact; Options B2 and B3 both present strategies to comprehensively repair the structural system of the Reflecting Pool, resulting in long-term beneficial impacts on Park management and operations.	Options C1 and C3 all represent long-term beneficial impacts to Park management and operations because, although they would require higher daily operating costs and staffing requirements than what currently exists, they would improve the water system and quality over time, representing a long-term efficiency to the Park. Option C2 represents a long-term moderate impact on Park management and operations because it introduces a new system with more equipment than the other options and ongoing maintenance requirements.	Cumulatively, there would be a long-term minor adverse impact on Park management and operations due to planned actions and special events. The long-term net impact of all options, however, is beneficial since the proposed actions would improve efficiency in Park management and operations over the long-term life of the pedestrian circulation system in the project area and the Reflecting Pool structural system and water system.
<b>Cultural Resources</b>	<p>The no action alternative would have direct, long-term moderate, adverse impacts on contributing features of the East and West Potomac Parks Historic District (primarily the Lincoln Memorial), the Plan of the City of Washington, and the World War II Memorial. Cumulative impacts would range from long term negligible to minor adverse.</p> <p>The no action alternative would result in direct and indirect, long-term, moderate adverse impacts on the green setting of the Reflecting Pool, a primary component of the Lincoln Memorial Grounds, and on reciprocal views between the Lincoln Memorial Grounds and the Washington Monument and Grounds. The cumulative impacts would be long-term negligible to minor adverse.</p>	The work of reorganizing and rehabilitating or replacing site furniture in the elm walks has its chief potential impact on the relationship between the Reflecting Pool and the parkland on either side. Adverse impacts would be direct, long-term, and either negligible or minor, depending on the final design, size, number, and placement of site furnishings.	<p>Options A1, A2, and A3 would have direct, long-term, minor adverse impacts on the design and setting of the Reflecting Pool and views associated with it and the Lincoln Memorial and other contributing features of the East and West Potomac Parks Historic District. These options would have direct, long-term, minor adverse impacts on the Lincoln Memorial cultural landscape.</p> <p>The current dirt paths already constitute a moderate adverse impact, and the formal walks would improve this situation. These new walkways would have direct, long-term, minor to moderate adverse impacts on these character-defining features of the cultural landscape.</p> <p>The NPS anticipates the resolution of direct long-term adverse impacts to minor intensity through consultation with the NCP, CFA, and the DC HPO.</p>	Option B1 in the action alternative, executed in accordance with the Secretary of Interior Standards, would constitute a minor to moderate beneficial impact on the Reflecting Pool and on the Lincoln Memorial Grounds' cultural landscape. The intensity of the impact would depend on the extent of the repairs to the Reflecting Pool and its coping. The B2 options and Option B3 have the beneficial impact of addressing underlying structural problems of the Reflecting Pool and maintaining its size, shape, location, reflectivity, and granite coping. Due to the removal of the existing slab, grade beam, and piles, however, these options are each judged to constitute a direct, long-term, minor, adverse impact on the Reflecting Pool structure.	Potential adverse impacts from all three water system options derive mostly from excavation for the construction of the underground pipes and subsurface vaults and the visibility of above-ground elements. These impacts mainly concern views of nearby contributing features. In C1 and C3, the new pump station would be designed to be consistent in style and material with other structures in the surrounding cultural landscape. In C2, there would be new equipment (ultrasonic transducers and subsurface concrete vaults) to support the water system. As a result of these new structures and equipment, there would be long-term minor adverse impacts to cultural resources in the project area.	The overall assessment below of the impacts upon cultural landscapes of the action alternative is that all components can be mitigated to remain at or below the minor adverse level. Therefore, the cumulative impact, a range of long-term beneficial to minor adverse, is unchanged.
<b>Aesthetics and Visual Quality</b>	The condition of uneven and irregular walking surfaces, worn site furnishings, and deteriorating stairs and landings constitute a long-term minor adverse impact on the visual character in the project area. The vistas within the project area are character-defining features of the Lincoln Memorial cultural landscape. Currently, the worn dirt paths that flank the Reflecting Pool compromise this grand vista, resulting in a long-term moderate adverse impact. The cumulative impacts on the visual resources of the National Mall and the project area, when combined with the long-term moderate adverse impacts associated with the no action alternative, would result in net long-term minor to moderate adverse cumulative impacts.	The proposed actions would result in long-term beneficial impacts to the visual resources and short-term minor adverse impacts resulting from construction activity. Options A1 and A2 would result in long-term minor adverse impacts, while Option A3 would have only negligible to minor impacts to the visual resources, views, and vistas around the Reflecting Pool.	<p>Options A1 and A2 would have a long-term minor adverse impact due to the introduction of non-historic landscape elements (such as bollards) that would be inconsistent with the visual character of the area and disruptive to views and vistas. Option A3 would generate only long-term negligible to minor adverse impacts since there would be a net loss of bollards and fewer visual intrusions from views looking west from the east of the project area. The curved walkways would be gently sloped and would not require handrails.</p> <p>The worn dirt paths that flank the Reflecting Pool would be paved with a material, color, and pattern that would be consistent with the historic resources in the project area and would harmoniously blend with the World War II walkway around the Rainbow Pool. In addition, the formalization of these paths would restore the historic vista to the project area, further contributing to long-term beneficial impacts.</p>	The structural enhancements would have similar long-term beneficial impacts resulting from the rehabilitated deficiencies including the granite coping and joints. Option B1 would have short-term moderate adverse impacts due to the duration of construction when the Reflecting Pool would be empty. Options B2 and B3 would have moderate adverse effects for the duration of construction, which could be long-term (approximately 21 months in duration), but not permanent.	The water system options vary in their levels of impact because each option introduces equipment and/or structures that would affect the visual character of the project area. Options C1 and C3 would introduce a new pump station to the project area at separate locations, which would introduce a long-term adverse effect on the visual character and views in the project area and from the Washington Monument, but which would be designed in a manner that would not yield impacts above a threshold of minor. Option C3 would introduce four subsurface electrical vaults to the south of the southern elm walk and one to the north of the Reflecting Pool, but these features would result in long-term minor adverse visual effects.	When combined with the long-term minor adverse impacts associated with the action alternative, there would be a net long-term minor cumulative adverse impact.

Resource Area	No Action Alternative	Action Alternative				
		Elm Walks	Site Circulation	Structural System	Water System	Cumulative Impacts
<b>Water Quality</b>	Continuing current management practices in the Reflecting Pool constitute a long-term negligible adverse impact to water quality in the Tidal Basin. The current method of discharge to the Tidal Basin is in violation of the Clean Water Act because, until recently, the EPA was unaware that the NPS was using this process. Since the NPS does not currently hold an NPDES permit, the EPA does not have the authority to allow this method of discharge to continue. Therefore, this situation needs to be remedied in the rehabilitation process to bring NPS into compliance with water quality regulations, and would possibly be required even if the rehabilitation does not take place. Continuation of the current management approach would also result in poorer than desired water quality in the Reflecting Pool and long-term minor adverse cumulative effects to water quality in the Tidal Basin.	The proposed actions at these locations would have no effect on water resources or water quality. Water supply for drinking fountains and irrigation along the elm walks would be furnished from the municipal water supply, and the drinking fountains would drain onsite; the drained water would be of relatively high quality and of negligible volume.	None of the site circulation options would involve water resources and therefore would have no effect on water resources or water quality.	All of the Reflecting Pool structural upgrade options would result in a beneficial impact on water resources because the repairs would halt the current leakage of water from the Reflecting Pool.	Option C1 would result in long-term minor improvements in water quality in the Reflecting Pool, and Option C3 would result in long-term negligible effects, ranging from adverse to beneficial effects on water quality in the Reflecting Pool. The difference between the two options is due to the different water sources proposed. Options C1 and C3 would have long-term negligible beneficial impacts to the water quality of the Tidal Basin and the Potomac River, assuming that NPDES permit requirements, discussed earlier in this chapter, can be met. All three options would cause short-term negligible adverse effects during construction, mitigated with the use of sediment and erosion control measures to prevent sediment runoff into adjacent water bodies or nearby storm sewers. There would be no impact on the water or wastewater utility. Option C2 would have no effect on water quality in receiving waters, as the Reflecting Pool will be directed through the wastewater treatment plant. It will, however, place a long-term, negligible adverse impact on the treatment plant.	Impacts from other projects and activities in the area that could affect water quality in the study area would be the same as described for the no action alternative. Specifically, the implementation of the DC WASA's long-term control plan (LTCP) to control combined sewer overflows in the District, as well as implementation of various stormwater management programs, would have long-term beneficial impacts on water quality in the Potomac River, and ultimately in the Tidal Basin. Under the action alternative, the long-term net impact of all options on water quality is a long-term benefit, when considered with other water quality improvement activities.
<b>Soils</b>	Implementation of the no action alternative would result in long-term minor adverse impacts to soil resources due to continued compaction of soils from visitor use and erosion of exposed soils during weather events. Cumulative impacts to soil resources resulting from special events and adjacent construction activity would be both short- and long-term, adverse and minor.	As a result of construction activities, soils would be compacted, soil structure would be modified, and soils would be exposed, increasing the potential for erosion. After construction, there would be long-term beneficial impacts resulting from the resurfaced elm walks and reconfigured site furnishings, which would discourage the formation of new social trails.	Implementation of Option A1, A2, or A3 would result in short-term minor adverse impacts to soils due to construction disturbance and the use of heavy equipment. Following construction, long-term negligible adverse impacts to soils would occur as a result of the permanent loss of soil productivity in those areas that would be paved, such as the soils under the proposed pathways and security walls. However, the new curved walkways would provide a formal pathway for visitors to transition between the elm walks, lower approachway, and east plaza so the opportunity for the formation of new social paths would be greatly reduced, resulting in a long-term beneficial impact to soils.  At the Reflecting Pool, the surfacing of the worn dirt paths would have no effect because the soils that would be paved are already compacted.	Various actions are proposed to improve the functionality of certain aspects of the Reflecting Pool, such as the structural system, water supply, volume, and drainage. These actions would all result in short-term minor adverse impacts to soils during construction due to the presence of heavy equipment and ground disturbance.	All options for improving the water system would require the installation of a new lateral pipe to connect the water source to the Reflecting Pool and/or to connect the Reflecting Pool to the discharge outflow. The installation of this water line would result in short-term, minor, adverse impacts to soils from disturbance during construction activities. Standard erosion and sediment control methods would prevent any long-term impacts. Exposed soils would be stabilized and replanted with vegetation as soon as possible following completion of construction activities. The construction of the pump station in Options C1 and C3 would result in short-term, minor adverse impacts to soils during construction and long-term, minor adverse impacts to soils due to the loss of soil productivity in the area of the structural footprint.	Projects and special events that could affect soils under the action alternative are the same as described in the no action alternative. Cumulative impacts to soils resulting from these actions would be short-term adverse and minor, but the net long-term cumulative impacts including impacts of the project would be beneficial.

Resource Area	No Action Alternative	Action Alternative				Cumulative Impacts
		Elm Walks	Site Circulation	Structural System	Water System	
<b>Vegetation</b>	The implementation of the no action alternative would result in long-term adverse impacts to turf in the project area, but no woody vegetation would be impacted. Therefore, impacts to vegetation under this alternative would be long-term, negligible, and adverse. Cumulative impacts to vegetation would be long-term, minor, and adverse	There would be short-term, minor adverse effects to the turf during due to the presence of construction equipment. There would be long-term beneficial impacts because the formation of new social trails would be greatly reduced, allowing vegetation to thrive.	Implementation of Option A1, A2, of A3 would have the same measurable effects; there would be short-term minor adverse effects to vegetation due to the presence of heavy equipment and the disruption to the topography. Due to the loss and/or replacement of some trees, there would be long-term minor adverse impacts mitigated by replanting and restoring the double ring of concentric elms around the Lincoln Memorial Circle.	Various actions are proposed to improve the functionality of certain aspects of the Reflecting Pool, such as the structural system, water supply, volume, and drainage. These actions would all involve short-term minor adverse impacts to vegetation during construction due to the presence of equipment and the disruption of turf.	All options would require the installation of a lateral pipe to or from the Reflecting Pool to support supply or discharge, which could potentially impact the existing trees. The depth of the line would likely avoid the root structure of the trees. No trees would need to be removed in West Potomac Park under any of the proposed options. Options C1 and C3 would require the construction of a 15' x 15' pump station and subsurface electrical vault. These structures would be located to avoid damage or removal of mature vegetation. However, long-term minor adverse impacts to existing turf or shrubs would be expected to occur within the construction footprint.	The cumulative impacts on vegetation would be long-term, minor, and adverse. The impacts of all these actions, in combination with the long-term minor adverse impacts on vegetation from the proposed action would result in long-term, minor adverse cumulative impacts on vegetation.
<b>Floodplains</b>	The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and its surrounding structures, elm walks, and the Lincoln Memorial east plaza. Under this alternative there would be no disturbance to any floodplains; therefore, no impacts would occur to any floodplains that currently exist within the project area.	Proposed activities associated with the action alternative would be located within the designated floodplains as described in Chapter 3 and would change floodplain functions and values because of the addition of new equipment, small structures, and infrastructure to the project area. However, these changes would be slight and would create an effect that is barely noticeable. The changes would not substantially affect flood water flows within the area in a measurable or noticeable way. The existing floodplain designations would remain unchanged. As a result, negligible impacts on floodplains would occur as a result of implementing any option of the action alternative. There would be no impairment to floodplains as a result of implementing any option of the action alternative.				Cumulative impacts, in combination with the negligible impacts on floodplains under the action alternative, would result in short-term negligible adverse cumulative impacts on floodplain functions or values.
<b>Transportation</b>	The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and its surrounding structures, elm walks, and the Lincoln Memorial east plaza. Under this alternative there would be no disturbance to any adjacent roadways, and no impacts to traffic or transportation would occur within the project area.	The proposed actions along the elm walks would have no effects on the transportation network either during or following construction.	The proposed actions at the Lincoln Memorial east plaza would have no effects on the transportation network either during or following construction. The main impacts on traffic and transportation for these options are associated with construction activity.	Option B1 would have short-term negligible impacts on transportation because the duration of construction would be only six months and only a relatively small volume of construction equipment would be required for implementation of this option. Options B2 and B3 would have minor adverse impacts during the construction period, which is expected to occur over more than one year, due to the construction equipment required to remove the demolished portions of the Reflecting Pool and to bring in new concrete to create a new structural system.	Options C1 and C3 would result in short-term minor adverse impacts to transportation due to the required partial closure of portions of Independence Avenue SW to accommodate the installation of new subsurface supply and drain lines to the Reflecting Pool. Option C2 would have no effect on transportation.	Construction activity from the Martin Luther King, Jr. National Memorial, which would affect portions of Independence Drive SW, would affect traffic in the project area. When combined with the short-term negligible to minor adverse impacts of Options B and C, there would be a net long-term minor adverse impact on traffic in this area.

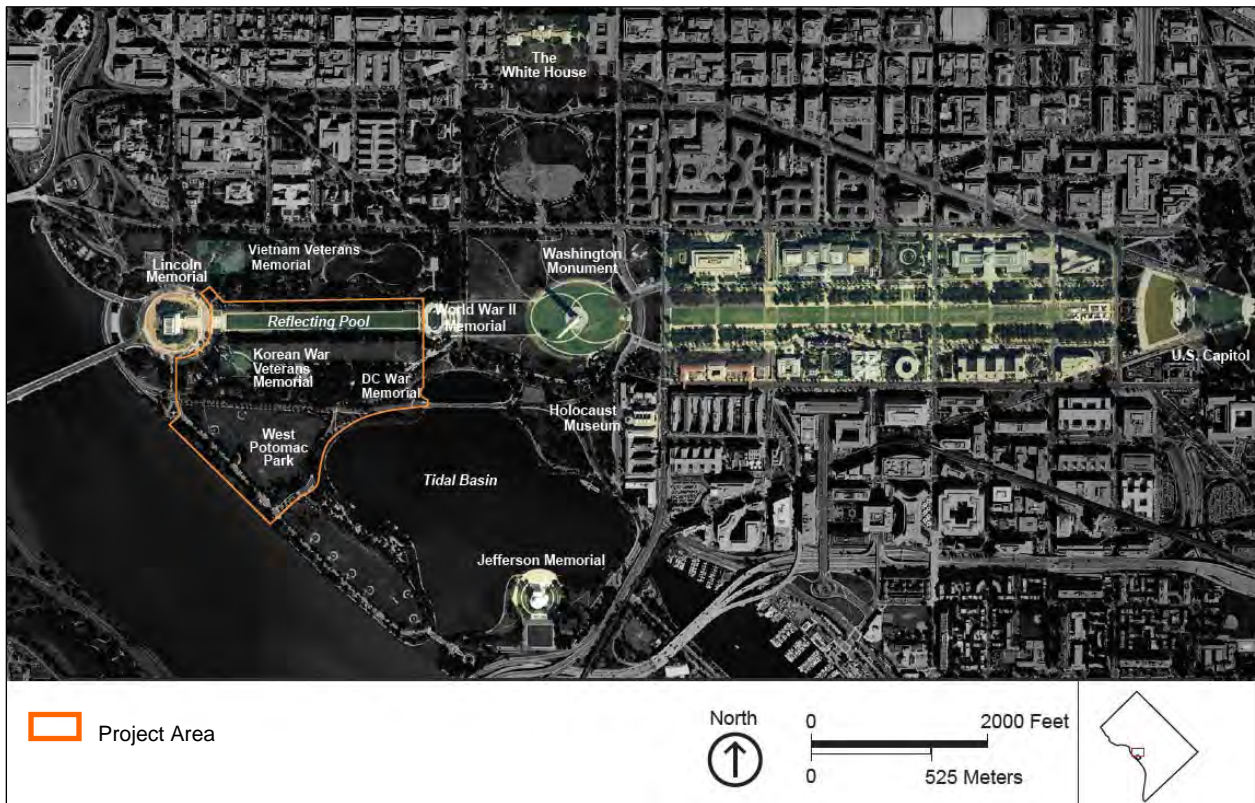
# CHAPTER 3: AFFECTED ENVIRONMENT

This chapter of the EA describes existing environmental conditions in the areas potentially affected by the proposed actions. These following resource areas are described: visitor use and experience, public safety, Park management and operations, cultural resources, aesthetics and visual resources, water resources, soils, vegetation, floodplains, and transportation. Potential impacts are discussed in “Chapter 4: Environmental Consequences” in the same order.

## Visitor Use and Experience

The project area is located within the unit of the NPS known as the National Mall and Memorial Parks, one of the most popular tourist destinations in the country. The National Mall contains many of the most prominent museums, monuments, memorials, and buildings of the city, including the U.S. Capitol Building, the Smithsonian Institution museums, the Washington Monument, the Lincoln Memorial, the Vietnam Veterans Memorial, the Korean War Veterans Memorial, Constitution Gardens, the World War II Memorial, and the Reflecting Pool as well as future project authorized by Congress such as the MLK Memorial and the VVMC. These resources are shown in Figure 3.1.

Figure 3.1 – Attractions in the project area



## VISITATION

April, May, and June are the most popular months for visitation. During early spring, fall, and winter, visitation to the monuments and memorials is highest during the day. Conversely, during summer, most visitors tend to spend their days inside the air-conditioned Smithsonian Institution museums and visit the outdoor monuments and memorials in the early evening and at night (NPS 2009a).

**SPECIAL EVENTS**

The National Mall hosts a variety of special events each year, some of which attract hundreds of thousands of visitors. One of the largest events is the annual National Cherry Blossom Festival which occurs around the Tidal Basin between the end of March and the beginning of April, coinciding with the forecasted blooming of the Japanese cherry trees. In 2008, approximately 170,000 visitors came to the National Mall between April 1 – 13 (NPS 2009c), with 78,500 visitors counted specifically for the Cherry Blossom Festival (NPS 2009g). Previous years had comparable numbers of visitors.

Two other special events draw substantial numbers of visitors to the project area. Over Memorial Day weekend, the First Amendment demonstration, parade, and motor cycle rally known as Rolling Thunder is held to support the organization’s cause to bring full accountability for prisoners of war and those still missing in action.

In addition, Independence Day festivities occur on July 4th throughout the National Mall, culminating in the pyrotechnics

display staged in the area immediately around the Reflecting Pool and the World War II Memorial. Prior to the festivities, large trucks bring fireworks into the project area via 17th Street NW and park on the worn dirt paths adjacent to the Reflecting Pool, requiring partial closure of the immediate area. The entire project area is closed after mid-afternoon on July 4th. Table 3.1 shows Independence Day visitation data from 2000–2008 (NPS 2008b).

Other heavily attended special events include Presidential Inaugurations, for which no official records are kept, and various discrete charitable and protest events that happen at irregular and unrelated dates each year. Some of these protest events draw upwards of 48,000 people (NPS 2008c).

**ATTRACTIONS**

The following sections describe those attractions within the National Mall that are relevant for this EA because of their proximity to the proposed actions being considered. These attractions include the Lincoln Memorial, the Vietnam Veterans Memorial, the Korean War Veterans Memorial, the Washington Monument, the Reflecting Pool, Constitution Gardens, and the World War II Memorial.

Table 3.1 Independence Day attendance on the National Mall

800,000										
700,000										
600,000										
500,000										
400,000										
300,000										
200,000										
100,000										
Visitors	2000	2001	2002	2003	2004	2005	2006	2007	2008	

Source NPS 2008b

Table 3.2 summarizes the daily, weekly, and annual management and operations schedules of each of the National Mall's major attractions.

Table 3.2 Management and Operations of the Monuments and Memorials

Monument	Hours of Operation (daily)	Days of Operation	Annual Closures	Tours
Lincoln Memorial	9:30 am – Midnight	7 days/week	Dec 25	Daily
Vietnam Veterans Memorial	9:30 am – Midnight	7 days/week	None	Daily
Korean War Veterans Memorial	9:30 am – Midnight	7 days/week	Dec 25	Daily
Washington Monument	9:00 am – 5:00 pm (Open until 10:00 pm between Memorial Day and Labor Day)	7 days/week	Dec 25 and July 4	Daily
Constitution Gardens	24 hours a day	7 days/week	None	Upon Request
World War II Memorial	9:30 am – Midnight	7 days/week	July 4	Daily

#### LINCOLN MEMORIAL REFLECTING POOL AND ELM WALKS

In 2008, there were 4,678,861 visitors to the Lincoln Memorial and 4,153,749 to the World War II Memorial (NPS 2009c). As of July 2009, there were 3,347,560 visitors (NPS 2009c). The 2009 data reflects an influx of visitors to the project area for the Inauguration festivities<sup>1</sup>.

On average, 4.5 million annual visitors travel between the Lincoln Memorial and the World War II Memorial<sup>2</sup>. A large number of these visitors walk along the Reflecting Pool, as evidenced by the worn dirt paths flanking its north and south sides. For the majority of visitors, the visit to the Reflecting Pool is transient, lasting as long as the duration it takes to walk between the two memorials. Nevertheless, others linger by the water to enjoy the vista. As a result of this transience, the NPS does not have explicit visitor use statistics for the Reflecting Pool, but it is reasonable to conclude that its visitor use is at least proportional to that of the Lincoln Memorial and the World War II Memorial.

While the majority of visitors walk along the worn dirt paths or on the granite coping, others travel along the historic elm walks that run parallel to the Reflecting Pool. The paths are generous in width, and at a width of 14 to 15 feet wide, they are roughly three times that of an average sidewalk. The walks are well traveled, paved asphalt pedestrian paths with benches and trash receptacles. A tree canopy overhead provides shaded relief. Many visitors stop and rest along the elm walks and use the benches to sit, eat, read, or to enjoy the views toward the Reflecting Pool. However, there are no drinking fountains along the elm walks; the nearest ones are in Constitution Gardens. There are also lighting fixtures along each elm walk to provide illumination at night. These fixtures were installed in 2007 and were intended to be replaced, as funding allowed, to enhance their functionality and appearance.

<sup>1</sup> The number of visitors is counted in the memorial six times a day for fifteen minutes in each sample period, selecting random times during the sample period. The actual sample counts are summed and divided by six to determine the average number of visitors of the samples. The average number of visitors is multiplied by 64 (this is the number of fifteen-minute time periods the Park is open) to determine the number of visitors to the memorial each day. The estimate for each day is summed for monthly visitation (NPS 2009c).

<sup>2</sup> There are approximately 4.5 million annual visitors who travel between the World War II and Lincoln Memorials. However, in 2008, the combined visitation between the World War II, FDR, Korean Veterans, Vietnam Veterans, and Lincoln Memorials was 15,110,392 (Weltzin 2009).

There are also worn dirt paths, or social paths, that run parallel to the elm walks behind the benches and trash receptacles. These paths were created by joggers and runners who either prefer the softer ground surface of the grass or want to avoid the deteriorating asphalt or crowds of visitors along the elm walks. Figure 2.1 shows a typical lighting fixture, as well as seating area with adjacent trash receptacle and social path behind.

#### **LINCOLN MEMORIAL AND EAST PLAZA**

The Lincoln Memorial is one of the city's most popular tourist attractions, drawing a total of 3.8 million visitors in 2006, 4.1 million in 2007, and 4.6 million in 2008 (NPS 2009c). It is open from 9:30 am to midnight, seven days a week. In 2008, visitation was highest during April, May, and August (NPS 2009c), as shown in Table 3.3, which summarizes visitation per month in 2008 to the visitor attractions around the project area.

Since its opening in 1922, the Lincoln Memorial and approachways have been used for some of the most significant concerts, speeches, and performances in American history. In addition, it is one of the most popular places to appreciate the vista across the Reflecting Pool to the Washington Monument. This area was also used to stage the 2009 Presidential Inauguration events.

Public restrooms and a gift shop are located in the lower level of the memorial. As a result of the visitor amenities and dramatic vistas, the Lincoln Memorial has become a natural resting spot at the terminus of the Mall, and the plaza and stairs serve as a popular seating area. The lower approachway leading to the Reflecting Pool is also a popular spot for seating due to the proximity to the water and information kiosks. During the warmer months, two informal concessionaire carts are also located adjacent to the lower approachway.

#### **WORLD WAR II MEMORIAL**

The World War II Memorial is located to the east of Reflecting Pool, separated from it by a 60-foot-wide paved concrete bridge. This memorial is another major tourist attraction in the project area, drawing 3.8 million visitors in 2006, 4.0 million visitors in 2007, and 4.1 million visitors in 2008. This memorial is located between the Lincoln Memorial and the Washington Monument, so it is visited by nearly all people who travel between these landmarks. Nevertheless, it is a prominent memorial in its own right, with a large plaza, display fountains, and symbolic features to commemorate the veterans of this war. Visitation peaks in the months of April and May, as shown in Table 3.3. It is open to the public seven days per week from 9:30 am to midnight.

#### **VIETNAM VETERANS MEMORIAL**

Approximately 850 feet northeast of the Lincoln Memorial is the Vietnam Veterans Memorial (flanked by the In Memorial Plaque, which is a part of the Vietnam Veterans Memorial, and the Vietnam Women's Memorial), which also attracts a large number of tourists, having drawn 3.6 million visitors in both 2006 and 2007. Visitation to the Vietnam Veterans Memorial in 2007 peaked in late April to early May, as shown in Table 3.3. This memorial consists of two sunken black granite walls, each approximately 250 feet long and splayed 125 degrees apart, aligned on axis with the Washington Monument and the Lincoln Memorial, respectively. The faces of the walls are etched with the names of the 58,261 people who fought and died in the Vietnam War. As such, this memorial is one of the most tactile and interactive, where people linger to peruse the names. It is open from 9:30 am to midnight, seven days a week and it is staffed by a NPS Ranger in the information kiosk located off the east plaza.

#### **KOREAN WAR VETERANS MEMORIAL**

Approximately 900 feet southeast of the Lincoln Memorial is the Korean War Veterans Memorial, which drew 3.2 million visitors in 2006, and 3.4 million in 2007. This memorial consists of several features. Several walls form a triangle, each inscribed with words and images, as well as 19 large-scale statues of

veterans, and a circular pool (Pool of Remembrance) surrounded by trees and benches. This memorial is in a shaded area and has several places for visitors to sit and observe the numerous components of the area. Public use data sets for the Korean War Veterans Memorial showed that visitation for 2007 peaked in May.

### WASHINGTON MONUMENT

The Washington Monument is a 555-foot-tall obelisk set upon a lawn approximately 106 acres in area. Visitors observe the monument, walk casually on the paved trails leading up to it, and (less commonly) have picnics on its lawn. During the summer months, the grounds are permitted for use by local softball teams during weekday evenings. Visitors enter the Washington Monument using a timed ticket system. Inside, they board the elevator that lifts them to the 500-foot observation deck where they can enjoy panoramic views of the National Mall and nearby environs. Two staircases provide access to the 490 level, which features exhibits on George Washington and the monument built in his honor. Visitors again board the elevator to descend. As they are lowered the elevator windows become transparent, affording everyone on-board views of some of the 195 tribute stones that decorate the monument's east and west interior walls. The Washington Monument is open from 9 a.m. to 5 p.m. daily and until 10 p.m. between Memorial Day and Labor Day. The Washington Monument is closed on July 4 and December 25. Ticketed entry into the Washington Monument was recorded at 586,000 visitors in 2006 and 591,000 visitors in 2007.

As shown in Table 3.3, visitation to the Washington Monument during 2007 peaked in the months of March, April, May, August, and September. However, relative to the other attractions described here, visitation to the Washington Monument is constant, and the peaks in March, April, May, August, and September are not very different from other months.

### CONSTITUTION GARDENS

The Constitution Gardens are located north of the Reflecting Pool and south of Constitution Avenue, between Henry Bacon Drive and 17th Street NW. There is also a "Circle of Remembrance," a garden enclosed by a circular stone wall constructed as part of the World War II Memorial. This 50-acre park has various walking paths that meander through trees and lawn and around the artificial lake. The concessions facility and restrooms are located near the lake, and the VVM is located at the western end of Constitution Gardens. The Park is open 24 hours a day, seven days per week (NPS 2008d). There is no quantitative data describing visitation to the Constitution Gardens.

Table 3.3 summarizes visitation per month in 2008 to the visitor attractions described previously.

Table 3.3 –Visits to Monuments and Memorials around the project area

2008 Month	Monument or Memorial					
	Lincoln	World War II	Vietnam	Korean War	Washington	TOTAL
January	144,555	127,776	131,723	110,101	41,893	556,048
February	229,067	124,896	138,016	114,795	42,263	649,037
March	473,152	469,675	467,541	376,331	55,359	1,842,058
April	570,379	582,069	577,600	498,112	54,058	2,282,218
May	596,619	569,984	507,637	474,624	55,906	2,204,770
June	482,763	460,437	488,235	457,941	57,424	1,946,800
July	492,480	454,528	464,597	409,120	76,125	1,896,850
August	493,739	441,600	412,736	290,048	82,497	1,720,620
September	334,432	250,357	303,317	224,960	52,046	1,165,112
October	376,192	316,000	291,733	289,099	55,533	1,328,557
November	303,040	230,336	329,355	288,448	52,092	1,203,271
December	182,443	126,091	131,083	121,397	45,835	606,849
<b>TOTAL</b>	<b>4,678,861</b>	<b>4,153,749</b>	<b>4,243,573</b>	<b>3,654,976</b>	<b>671,031</b>	<b>17,402,190</b>

Source: NPS 2009c



### **LINCOLN MEMORIAL RECREATIONAL FIELDS**

In addition to special events, the project area is also used for active recreational purposes, with several fields adjacent to the project area. There area immediately to the south of the southern elm walk is used for soccer and is permitted for such use through the NPS. To the northwest of the site, along 23rd Street NW, are several fields used for baseball and softball. The use of these fields is permitted through the DC Department of Parks and Recreation.

### **WEST POTOMAC PARK, SOUTH OF INDEPENDENCE AVENUE SW**

The southern part of the project area includes numerous recreational amenities and several popular visitor attractions such as the Franklin Delano Roosevelt Memorial and the Thomas Jefferson Memorial. This narrow strip of land between the Tidal Basin and the Potomac River is defined primarily by the recreational fields and tree-lined Ohio Drive SW, which leads to East Potomac Park. Along the length of Ohio Drive, there is ample off street parking for visitors and extensive segments of accessible concrete walkways with benches and drinking fountains. Due to the relative seclusion of Ohio Drive, its flat topography, and the low volume of traffic, the roadway is enjoyed extensively by bicyclists, joggers, and walkers. Portions of the area along the water are used for fishing.

## Public Safety

The NPS is committed to providing high quality opportunities for visitors and employees to enjoy Parks in a safe and healthy environment. Furthermore, the NPS strives to protect human life and provide for injury-free visits. Safety applies to both Park visitors and Park employees.

### VISITOR SAFETY

A visitor incident is defined as an unintentional event or mishap affecting any person, other than an NPS employee, that results in serious injury or illness requiring medical treatment. In this particular project area, visitor incidents have statistically been related to pedestrian circulation, fatigue, exposure to the elements, or recreational activities (sports-related injuries on adjacent athletic fields, bicycling accidents, etc.).

The majority of visitor incidents in the project area are related to visitors tripping over curbs, uneven surfaces, or steps. Figure 3.2 shows an example of uneven pavement in the project area.

In addition, the peak time for visitors to the project area is spring and summer, when the temperatures in Washington, D.C. can exceed 100 degrees with high humidity levels. It is not surprising that a fair amount of incidents are also related to these excessive weather conditions, resulting in personal illnesses such as exhaustion, fainting, nausea, seizures, etc.

The project area is also well used by joggers, cyclists, and athletes who use the walkways and recreational fields in and around the project area. There are some incidents that result from these kinds of recreational activities, including sports injuries and cycling accidents.

The NPS maintains statistics on internal case incident reports; these are compared and verified with U.S. Park Police (USPP) case incident records. In the case of more serious incidents or mishaps, NPS and/or USPP conduct further investigation. To prevent visitor incidents, NPS Park rangers within the Division of Interpretation and Education conduct frequent inspections of visitation areas and provide visitors with information or instructions about safety measures and behavior. Areas determined to be unsafe are identified and restricted so visitors can avoid risk of injury (NPS 2009a).

Table 3.4 reflects three years' comparative data for the NPS fiscal year (FY) reporting period, October 1 through September 30. It is important to note that the FY2009 statistics might be proportionately higher due to the unprecedented amount of visitors to the project area during the Presidential Inauguration festivities in January, where millions of people were outdoors for extended periods of time in extremely cold weather conditions.

In 2008, there were 276 visitor-related incidents within the NAMA. Of these, for purposes of recordkeeping and tracking in accordance with the *Government Performance Results Act* (GPRA), 128 were actually chargeable offenses. Of the remaining incidents, many were categorized as personal illness

Figure 3.2 – Example of uneven pavement along the north elm walk



Table 3.4 - Public Safety Incidents, 2007–2008

	FY2007	FY2008
Number of Visitor Incidents responded to	299	276
Chargeable Visitor Injuries	174	128
Injury Type: Slips, Trips and Falls	107	58
Injuries as a result of Normal Walking	55	56
Incidents related to steps of Monument or Memorials	32	17
Bicycle-related injuries	15	10
Sports-related injuries	21	4
Personal Illnesses	137	138

and were unrelated to direct interaction with the Park facilities and equipment.

Since swimming and wading in the Reflecting Pool is prohibited, the number of incidents resulting from recreational use is low. Despite this restriction, the NPS attempts to maintain the water quality in the Reflecting Pool at a suitable level so that if by accident, or some other unintentional course of action, a person were to be fully submerged in the Reflecting Pool, they would not be exposed to adverse human health effects, such as waterborne diseases from raw sewage contamination.

Inputs of organic matter, including goose and waterfowl feces, coupled with elevated water temperatures during the warmer months and little water flow, encourages bacterial reproduction and algal growth that affects water quality at times. Although the water entering the Reflecting Pool has already been treated with chloramine, a disinfectant commonly used to treat drinking water that resists degradation, as well as with an algal inoculation, there are still residual water quality problems resulting from the accumulation of organic matter and lack of flow in the Reflecting Pool. The presence of bacteria or other pathogens in the Reflecting Pool could pose a potential risk to public health from waterborne illnesses, as a result of accidental ingestion or from contact with open cuts or sores, should visitors fall into the Reflecting Pool or illegally wade in it during the warmer months of the year.

**EMPLOYEE SAFETY AND HEALTH**

NAMA Park staff are subject to the same tripping hazards that pertain to the general public. However, most employee injuries or incidents are usually sustained by maintenance staff who perform manual work and heavy material handling (construction, gardening, etc.). The most common type of injuries were maintenance activity-related, such as low back, shoulder and knee injuries; however, periodic NPS ergonomics training is offered to reduce repetitive motion disorders.

The NPS is also proactive about protecting the safety and health of employees. The Park developed a multiyear incident reduction plan for each of its departments which. Implementation of this plan has reduced the more serious incidents that result in Occupational Safety and Health Administration Days Away From Work and Restricted Transfer (OSHA DART) cases. NPS has an active Safety and Health Committee made of representatives from each major work group and the union. Members conduct monthly internal safety and health inspections, assist with training, and serve as a review board for all property damage cases. Safety, Health and Environmental Bulletins are sent out frequently to increase communication effectiveness (NPS 2009a). Table 3.5 shows the injury rates for recent years.

Table 3.5 - Employee OSHA Recordable Injury Rates for Recent Years

Fiscal Year	OSHA Recordables		OSHA DART Cases		Office of Worker's Compensation Programs (OWCP) (Continuation-of-Pay) Hours Paid
	N	Incidence Rate <sup>1</sup>	N	Incidence Rate	
2008	29	10.3	22	7.8	4,157
2007	40	12.7	25	7.9	5,625
2006	30	9.7	22	7.1	4,901
2005	27	8.3	21	6.4	4,548

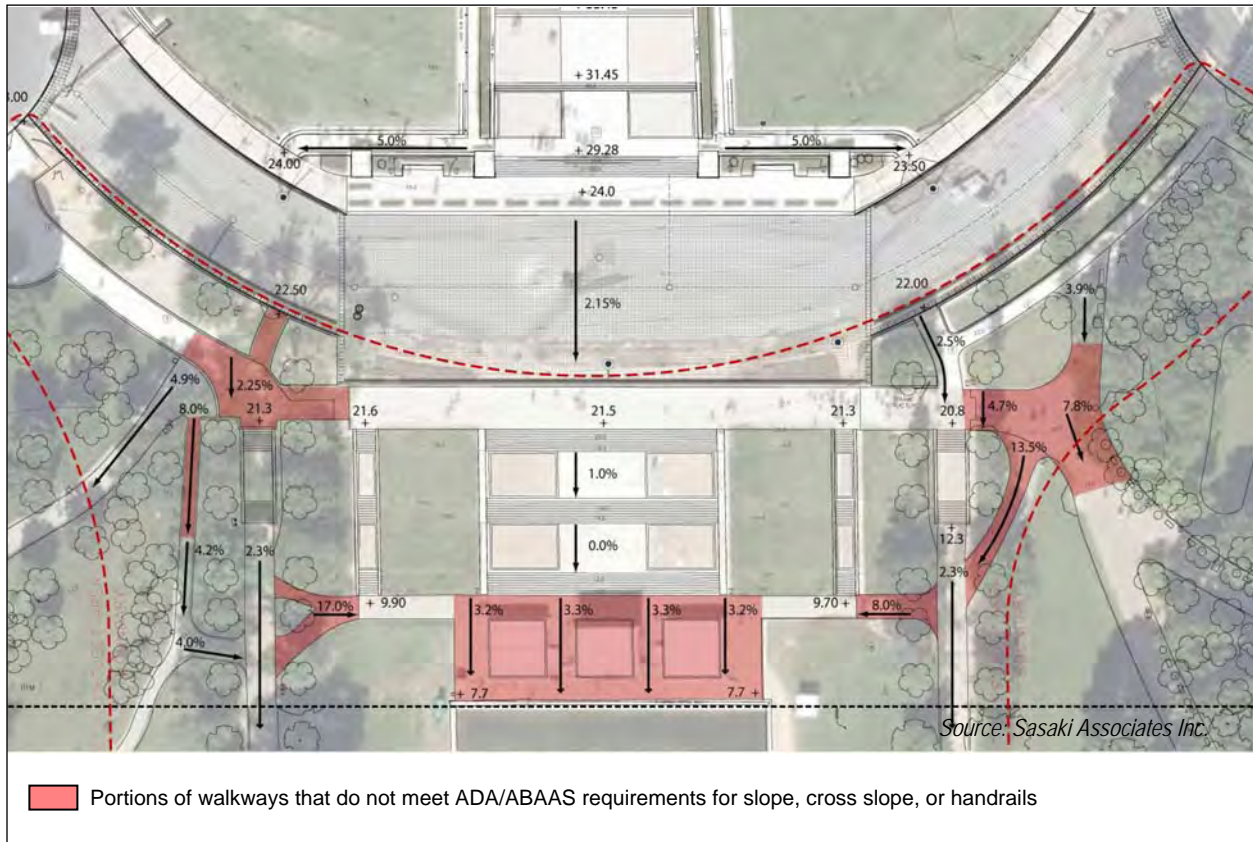
Note 1: OSHA Incidence Rate (IR) for a classification of occupational injuries and illnesses only = (Number of injuries and illnesses x 200,000) / Employee hours worked for a measurable period of time. N= number of injuries.

**ACCESSIBILITY**

Current accessibility deficiencies exist in the primary routes to the Lincoln Memorial. Several areas of the project area are not ADA/ABAAS compliant (see Figure 3.3), meaning the walkways exceed a 5 percent, incline, or rise more than one foot over a distance of 20 feet. In addition, there are unpaved circulation

routes, uneven asphalt paths, broken concrete pavement, and uneven concrete and stone pavement, affecting millions of visitors annually to the project area.

Figure 3.3 – Non-Accessible pathways in the project area



## **Park Management and Operations**

NAMA is an administrative unit of the National Park System. Park management structure is divided into the Office of the Superintendent and several divisions including Administration, Maintenance, Interpretation and Education, Park Programs, and Resource Management. Overall management decisions concerning NAMA and the resources within it are the responsibility of the Superintendent, while an on-site manager coordinates the daily operations and staff.

### **VISITOR SERVICES**

NPS has staff working at numerous sites throughout the Park, as well as staff specifically assigned to the Lincoln Memorial and the Reflecting Pool. Park employees at these areas provide on-site interpretative services such as guiding tours, providing information, answering questions, and hosting special holiday events. The Park currently has two full-time staff assigned to the Vietnam Veterans Memorial kiosk and two full-time staff assigned to the Korean War Veterans Memorial kiosk. Additional employees are assigned to the project area during special events or for emergency response, as described in the Public Safety section of this chapter.

### **PARK MAINTENANCE**

Due to the volume of visitor use, a proportionately larger number of maintenance staff is assigned to the project area, relative to other parts of NAMA, to maintain the lower approachway stairs and landings, the length of both elm walks, the turf and vegetation in the project area, and the Reflecting Pool itself.

The NAMA maintenance staff is responsible for the general upkeep of the grounds (including the elm walks, lower approachway, east plaza, Reflecting Pool, and recreational fields to the south of the project area and in West Potomac Park). In addition, NAMA staff maintains the lawns and hedges, removes trash and snow, and tends to the general maintenance of Park resources.

*Trash and Debris Removal* - Along the elm walks, the trash receptacles are emptied several times a day. At the Reflecting Pool, solid waste is removed from the Reflecting Pool as needed, which due to the number of visitors, is required weekly. The maintenance vehicles access the site from the Lincoln Memorial east plaza and enter the project area via two retractable bollards.

*Lawn Maintenance* - The lawn around the Reflecting Pool is maintained several times a month, and more frequently in the spring and summer months. A large riding lawn mower is used for the turf area, while a push mover is used for smaller areas around the lower approachway. The maintenance vehicles currently enter the site in the same fashion as trash removal vehicles.

*Snow Removal* - Snow is removed from the east plaza, elm walks, and lower approachway stairs and landings as needed. There is no current maintenance plan to remove snow from the worn dirt paths that flank the Reflecting Pool.

### **PARK OPERATIONS**

*Park Operating Budget* - Budgets are not assigned to specific memorials or areas of the Park but rather come as one appropriation. The annual operating budget for NAMA for FY2007 and FY2008 was \$30,160,530 and \$31,421,740 respectively.

*Resource Consumption* - Historically, the majority of the operating budget for the Park is required at the Reflecting Pool, due to the large volume of water loss from constant water leakage and evaporation.

## Cultural Resources

Cultural resources for federal agency planning and environmental review purposes are primarily those resources that qualify for the NRHP as well as those addressed by certain other laws protecting archeological sites and Native American properties. The NHPA of 1966, as amended, is the principal legislative authority for managing cultural resources associated with NPS projects. Generally, Section 106 of the NHPA requires all federal agencies to consider the effects of their actions on cultural resources listed and/or determined eligible for listing in the NRHP. Such resources are also termed “historic properties.”

Moreover, the federal agency must afford the ACHP the opportunity to comment in the event that an undertaking will have an adverse effect on a cultural resource that is eligible for or listed in the NRHP, and must consult with the State Historic Preservation Officer (SHPO) and other interested parties in an effort to avoid, minimize, or mitigate adverse effects.

Eligibility for the NRHP is established according to the official Criteria of Evaluation (36 CFR 60.4) issued by the Department of the Interior. The criteria relate to the following:

The quality of significance in American history, architecture, archeology, engineering, and culture present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

Other important laws and regulations designed to protect cultural resources are:

- *Native American Graves Protection and Repatriation Act (NAGPRA)*, 1990
- *American Indian Religious Freedom Act (AIRFA)*, 1978
- *National Environmental Policy Act (NEPA)*, 1969
- *Archeological Resources Protection Act (ARPA)*, 1979
- *Executive Order 11593: Protection and Enhancement of the Cultural Environment*, 1971

Lastly, the NPS has a unique stewardship role in the management of its cultural properties, reflected in its own regulations and policies. In these policies, the NPS categorizes cultural resources by the following categories: archeological resources, cultural landscapes, historic districts and structures, museum objects, and ethnographic resources.

As indicated in Chapter 1, not all categories or classifications of cultural resources are relevant for the Reflecting Pool rehabilitation project. Among those resources potentially eligible for the NRHP, archeology was dismissed as an impact topic because the project would be built on made land or “fill” (see Chapter 1). Ethnographic resources and museum collections were also determined irrelevant to the project and were therefore dismissed as impact topics.

For the purposes of this EA, cultural resources impact topics include architectural features, historic districts, cultural landscapes, and memorials. Although not all memorials on the National Mall have been listed in the National Register either individually or as contributing resources to historic districts, the NPS treats them as eligible. The consideration of cultural resources by the NPS meets pertinent requirements of the NHPA and related legislation and implementing regulations.

An APE for this undertaking was delineated by the NPS after consultation with the DC HPO and Consulting Parties invited under the NHPA Section 106 consultation process. It encompasses NPS reservations 332 (West Potomac Park) and 2 (Washington Monument Grounds) in northwest and southwest Washington, D.C. This area is generally bounded by the Potomac River on the west, Constitution Avenue on the north, 14<sup>th</sup> Street and Raoul Wallenberg Place on the east, and the Potomac River Railroad Bridge on the south. In addition to these two reservations, the affected environment also includes the axis between the Capitol Building and the Lincoln Memorial, which is a significant feature of the 1902 McMillan (or Senate Park Commission) Plan for Washington and recognized in National Register documentation for the Plan of the City of Washington.

A multitude of cultural resources are located within the APE, ranging from cultural landscapes, individual buildings, structures, monuments, and statues. APE includes ten individually listed properties, six cultural landscapes, and parts of one historic district. In addition, the APE contains contributing resources identified in the National Register documentation for the Plan of the City of Washington, which is categorized as a structure. For a complete list of all identified cultural resources within the APE, see Table 3.6. A map of the APE is delineated in Figures 3.4, 3.5, and 3.6. Only the resources that appear to be affected by this undertaking are described in detail in this section and are located in the immediate vicinity of the Reflecting Pool.

#### **HISTORIC STRUCTURES AND DISTRICTS**

This section addresses historic properties present that have been included in or have been determined eligible for the NRHP as buildings, structures, sites, objects, or historic districts. Because the monumental core of Washington has been a focus of preservation activity from the initial passage of the NHPA in 1966 and before, the official documentation of its historic resources has been accomplished in a series of studies that sometimes overlap and vary in approach with changing technical standards. Therefore, the following discussion addresses some of the same resources discussed in Cultural Landscapes.

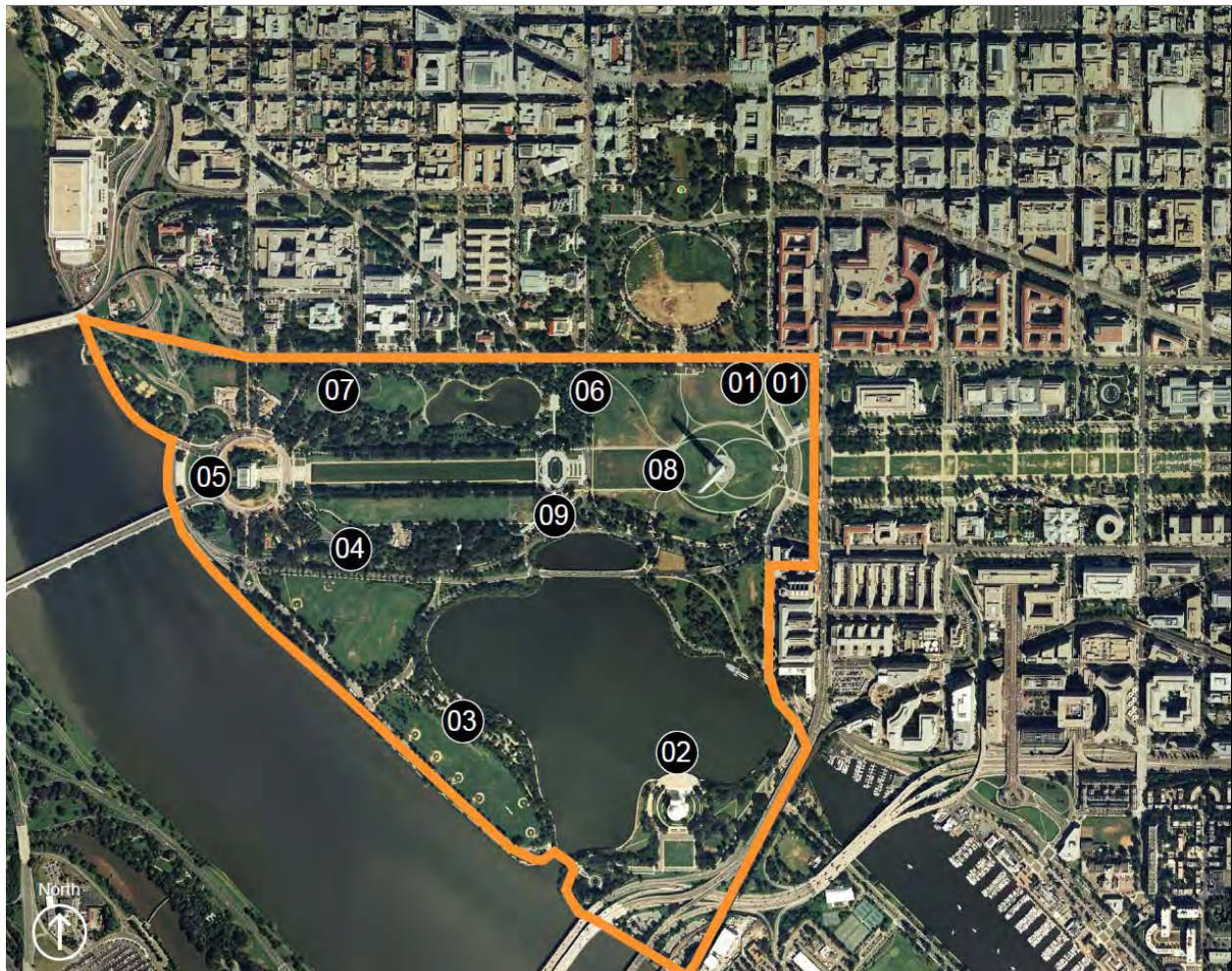
Table 3.6 - Historic Resources Within the Area of Potential Effect

INDIVIDUALLY LISTED HISTORIC PROPERTIES	HISTORIC DISTRICT
Bulfinch Gatehouse and Gateposts	East and West Potomac Parks Historic District
Franklin Delano Roosevelt Memorial	<b>MEMORIALS</b>
Thomas Jefferson Memorial	56 Signers Memorial
Korean War Veterans Memorial	D.C. War Memorial
Lincoln Memorial	Franklin Delano Roosevelt Memorial
Lock Keeper's House	Thomas Jefferson Memorial
Vietnam Veterans Memorial	John Ericsson National Memorial
Washington Monument and Grounds	John Paul Jones Monument
World War II Memorial	Korean War Veterans Memorial
Plan of the City of Washington (L'Enfant-McMillan Plan)	Lincoln Memorial
<b>CULTURAL LANDSCAPES</b>	Vietnam Veterans Memorial
Constitution Gardens	Vietnam Women's Memorial
D.C. War Memorial	World War II Memorial
Lincoln Memorial Grounds	
Thomas Jefferson Memorial Grounds	
Washington Monument and Grounds	
National Mall	

The project has the potential to directly or indirectly affect ten historic properties individually listed in or determined eligible for the National Register. The undertaking also has the potential to directly or indirectly affect contributing resources in the East and West Potomac Parks Historic District. Preliminary analysis of other individually listed properties within the APE suggests they will not be affected due to their distance from the project site. Figure 3.4 shows the individually listed historic properties within the APE, and Figure 3.5 shows the historic district and its contributing properties within the APE.

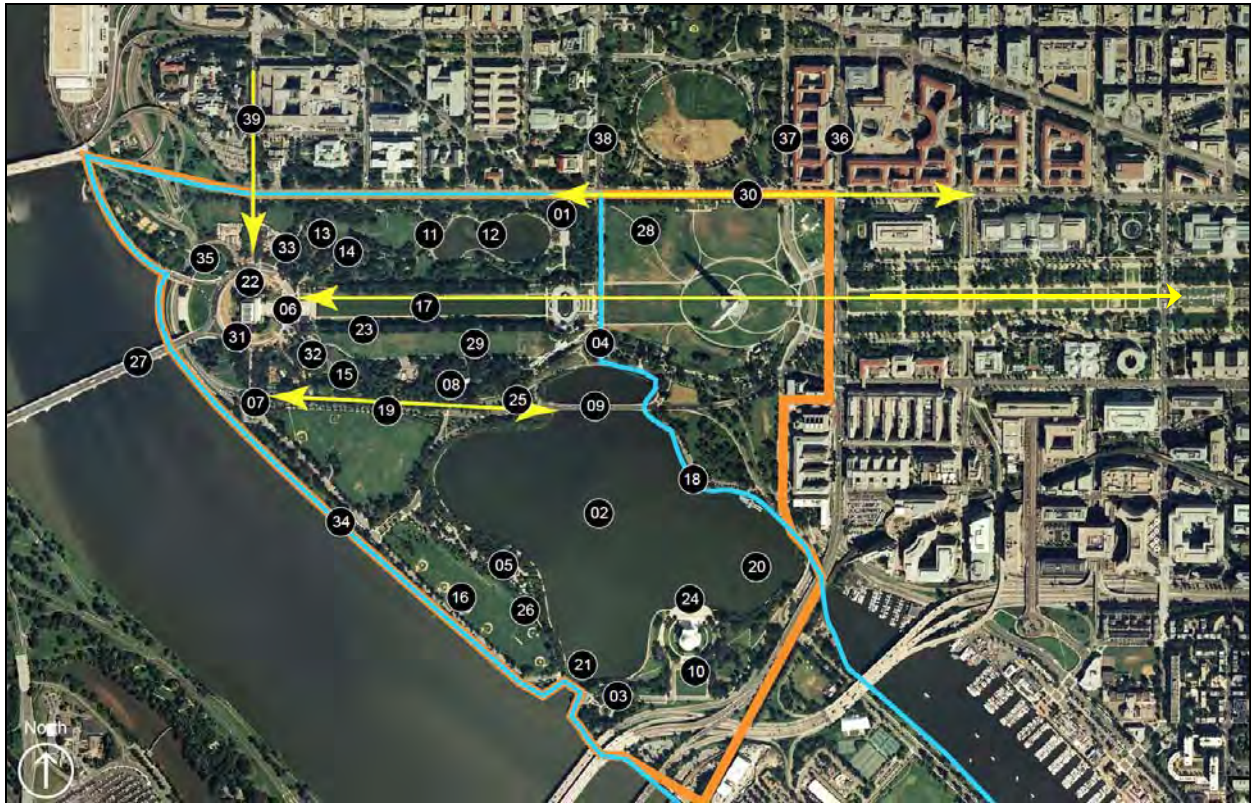


Figure 3.4 – Individually Listed Historic Properties within the APE




- Area of Potential Effects (Reservations 332 and 2)
- 1. Bulfinch Gatehouse and Gateposts (2)
- 2. Jefferson Memorial\*
- 3. Franklin Delano Roosevelt Memorial\*
- 4. Korean War Veterans Memorial\*
- 5. Lincoln Memorial\*
- 6. Lockkeeper's House\*
- 7. Vietnam Veterans Memorial\*
- 8. Washington Monument and Grounds
- 9. World War II Memorial
- 10. Plan of the City of Washington (not indicated on graphic)
- \*Both a Contributing Property to a Historic District and Individually Listed

Figure 3.5 – Historic Districts and Contributing Properties within the APE



 Area of Potential Effect

 East and West Potomac Parks Historic District  
[National Register, November 30, 1973  
(revised November 11, 2001);  
DC Inventory, November 8, 1964]

1. Lock Keeper's House
2. Tidal Basin
3. Number 4 Fountain
4. John Paul Jones Monument
5. Japanese Cherry Trees and Statuary
6. Lincoln Memorial Grounds\*
7. John Ericsson Monument
8. DC WWI Memorial
9. Kutz Bridge & Independence Avenue Extension
10. Thomas Jefferson Memorial Grounds
11. Constitution Gardens\*
12. 56 Signers Memorial
13. Vietnam Veterans Memorial
14. Vietnam Women's Memorial
15. Korean War Veterans Memorial\*
16. Franklin Delano Roosevelt Memorial
17. Reflecting Pool\*
18. Stone Seawalls
19. Independence Avenue Extension\*
20. Tidal Reservoir Outlet Bridge
21. Tidal Reservoir Inlet Bridge
22. Lincoln Memorial
23. Dutch Elm Trees
24. Thomas Jefferson Memorial
25. Japanese Lantern
26. Japanese Pagoda\*
27. Arlington Memorial Bridge

Contributing Resources to the Plan of the City of Washington (L'Enfant - McMillan Plan) [National Register, April 24 1999, Draft NHL Nomination January 4, 2001]

**Original Appropriations and Reservations**

28. Reservation No. 2: Washington Monument Grounds
29. Reservation No. 332: West Potomac Park

**Avenues**

30. Constitution Avenue NW

**Named Streets**

31. Circle around the Lincoln Memorial
32. Daniel French Drive
33. Henry Bacon Drive
34. Ohio Drive
35. Terminus of the Rock Creek and Potomac Parkway

**Numbered Streets**

36. 14th Street NW-SW
37. 15th Street NW-SW
38. 17th Street NW
39. 23rd Street NW



**Associated Vistas**

- 23rd Street NW (Washington Circle/Lincoln Memorial)
- Constitution and Independence Avenues (Capitol Grounds, National Mall, and Potomac Parks)
- U.S. Capitol along the National Mall to the Lincoln Memorial and the western horizon

\* Both a Contributing Property to a Historic District and Individually Listed

Listed in the NRHP in 1981, the Lincoln Memorial, at the foot of 23rd Street NW, is significant in the areas of architecture, landscape architecture, sculpture, and commemoration. Completed in 1922, it is an excellent and distinctive example of a Beaux Arts monument in the United States, and it is important as a shrine to Abraham Lincoln. Designed by architect Henry Bacon, with landscape contributions from Frederick Law Olmsted, Jr., the memorial's National Register documentation also specifies its function as the western terminus of the east-west axis that runs through the Capitol and the Washington Monument and across West Potomac Park as an aspect of its significance. The individual listing includes 19 acres, excluding the Reflecting Pool and grounds to the east (NPS 1981a). The NPS documented the contributing features of the Lincoln Memorial Grounds with a cultural landscape report in 1999. Key contributing features of the grounds include the Reflecting Pool, the grass panels and elm trees flanking the Reflecting Pool and their associated walks, the terraced steps rising from the Reflecting Pool level to the memorial level, the circular drive surrounding the memorial, the steps from the drive to the memorial on the east, the landscape of grass and evergreens within the circle, elm trees and street lights associated with the circular drive, and Henry Bacon and Daniel Chester French Drives. (See more detailed information under "Cultural Landscapes," below.)

The Washington Monument and Grounds were listed in the NRHP in 1981 for the site's significance as the leading memorial to George Washington, as an example of Egyptian Revival architecture, for its contribution to the history of structural engineering, and for its landscaped grounds, which are central to the monumental core of the capital. Construction began on the structure in 1848 and was completed 36 years later in 1884. Utilizing leftover stone from the monument's construction, a Boiler House and a Monument Lodge were built on the grounds in 1886 and 1888, respectively. The Boiler House, which was originally constructed to house the steam-generating plant for the Washington Monument elevator, was later renamed the Survey Lodge and now serves as the headquarters for NPS Mall Operations. The Monument Lodge contains restrooms and a book store and provides will call and ticket reservations for the monument. The significance of the Washington Monument and Grounds as a cultural landscape, a term not current in 1981, was not recognized and documented until recently. See the discussion of this property under the following section, "Cultural Landscapes."

The Vietnam Veterans Memorial, designed by architect Maya Lin, was administratively listed in the NRHP the same day as its dedication ceremony in November 1982. Located in the northwest corner of Constitution Gardens, the memorial is comprised of a V-shaped black granite wall. The landscape for the memorial area was entirely regraded, so the ground slopes down to the walls. One of the walls is aligned with the Washington Monument, while the other looks to the Lincoln Memorial. The memorial was inscribed with the 58,261 names of those that had served in Vietnam and were killed during the war (NPS 2008a).

Like the Vietnam Veterans Memorial, the Korean War Veterans Memorial was listed in the National Register on the day of its dedication in 1995. The memorial was authorized by legislation signed into law on October 28, 1986. Situated across the Reflecting Pool from the Vietnam Veterans Memorial, the Korean War Veterans Memorial consists of 19 larger-than-life-size stainless steel figures representing the servicemen who participated in the war, a pool of remembrance, and granite walls on which are emblazoned historic photographs of the conflict. Cooper-Lecky Partnership designed the constructed memorial, adapting a competition-winning design by four architects and landscape architects from Pennsylvania State University. Frank Gaylord, of Barre, Vermont, sculpted the 19 figures, which are arranged in combat formation, climbing a hill. (Bobeczko and Robinson 1998)

The L'Enfant Plan of the City of Washington, D.C., was listed in the NRHP in 1997 for its "relationship with the creation of the new United States of America and the creation of a capital city."<sup>3</sup> It was recognized as a "well-preserved, comprehensive, Baroque plan with Beaux Arts modifications" (Leach and Barthold 1994:8-2). The period of significance is 1790 to 1942 and encompasses both the 1791 L'Enfant Plan and the 1902 McMillan Plan developed by a four-member commission that included architects Charles McKim and Daniel Burnham, landscape architect Frederick Law Olmsted, Jr., and sculptor Augustus Saint-Gaudens. The 3,565-acre nominated area "reflects the street grid, diagonal avenues, parks and their statuary, vistas among monuments and sites over federal land within the plan's boundaries, and the airspace above this matrix up to the legal height limit in the city" (Leach and Barthold 1994). Contributing features of the Plan of the City of Washington include the parks, reservations, and streets, although views and vistas are also noted as critical elements that define the design intent by both L'Enfant and the McMillan Commission. With particular relevance to this proposed project, Constitution Avenue and 17th and 23rd streets, NW, (extending from Independence Avenue to Florida Avenue) are contributing features of the Plan of the City of Washington. A list of contributing associated vistas in the Plan of the City of Washington (L'Enfant – McMillan) nomination with relevance to this undertaking includes those from the U.S. Capitol along the Mall to the Lincoln Memorial and the western horizon and reciprocal views from the Lincoln Memorial toward the Capitol, vistas along Constitution and Independence Avenues providing frontal views of the Mall, and West Potomac Park, and views of the Lincoln Memorial from 23rd Street (Leach and Barthold 1994).

The East and West Potomac Parks Historic District was originally listed on the NRHP in 1973 (Dillon 1973b), and a revised nomination was accepted in 2001 (Bobecko and Robinson 1998). As historic districts include many resources, it is customary to document which ones are "contributing" to the significance of the historic district and which ones are "noncontributing." The two parks (NPS Reservations 333 and 332, respectively) are significant under a vast array of contexts including art, architecture, engineering, landscape architecture, entertainment/recreation, city planning, social history, politics/government, commemoration, and transportation. West Potomac Park includes approximately 400 acres and extends from the Potomac River to 17th Street (west to east) and from Constitution Avenue to the Potomac Railroad Bridge (north to south). It was originally meant to serve passive recreation purposes with areas reserved for active recreation. From its original concept, it has developed into a "designed landscape occupied by prominent monuments and memorials" (Bobecko and Robinson 1998). Although the park was developed from a concept central to the L'Enfant Plan of 1791, its overall design is associated with the 1902 McMillan, or Senate Park Commission, Plan. These elements include its "traditional Baroque plan, long vistas, axial relationships, and expansive open spaces" (Bobecko and Robinson 1998). Elements of the park that contribute to its significance include the Lincoln Memorial Grounds, the Reflecting Pool, Dutch elm trees, Arlington Memorial Bridge, Constitution Gardens, and Vietnam Veterans Memorial. Other contributing features of West Potomac Park are the Tidal Basin, the Thomas Jefferson Memorial, stone sea walls, Independence Avenue extension, Kutz Bridge, Japanese cherry trees, Franklin Delano Roosevelt Memorial, and Commodore John Paul Jones statue, among others (Bobecko and Robinson 1998).

The World War II Memorial, authorized by Congress in 1993, is the first national memorial dedicated to all who served during World War II. The east end of the Reflecting Pool was chosen as the memorial's site, which eventually covered 7.4 acres. Designed by Friedrich St. Florian, an architect based in Providence, Rhode Island, the memorial opened to the public in 2004 after three years of construction. It was at this time that the memorial was transferred from the American Battle Monuments Commission to

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<sup>3</sup> The draft NHL nomination (Robinson & Associates, Inc., January 4, 2001) updates and amends Sara Amy Leach and Elizabeth Barthold, National Register of Historic Places – Registration Form, "L'Enfant Plan of the City of Washington, D.C." (Washington, D.C.: Department of the Interior, National Park Service, April 24, 1997).

the NPS. The World War II Memorial consists of 56 pillars and a pair of arches surrounding a plaza and fountain. The pillars, representing each state and U.S. territory during World War II, are 17 feet tall, arranged in a semicircle around a plaza with two 43-foot arches on opposite sides. The north arch is inscribed as “Atlantic” and the southern arch “Pacific.” The “Circle of Remembrance” is a garden 38 feet in diameter northwest of the memorial in Constitution Gardens. Enclosed by a two-foot-high stone wall, the garden includes a seating area with wood benches. (National World War II Memorial 2003)

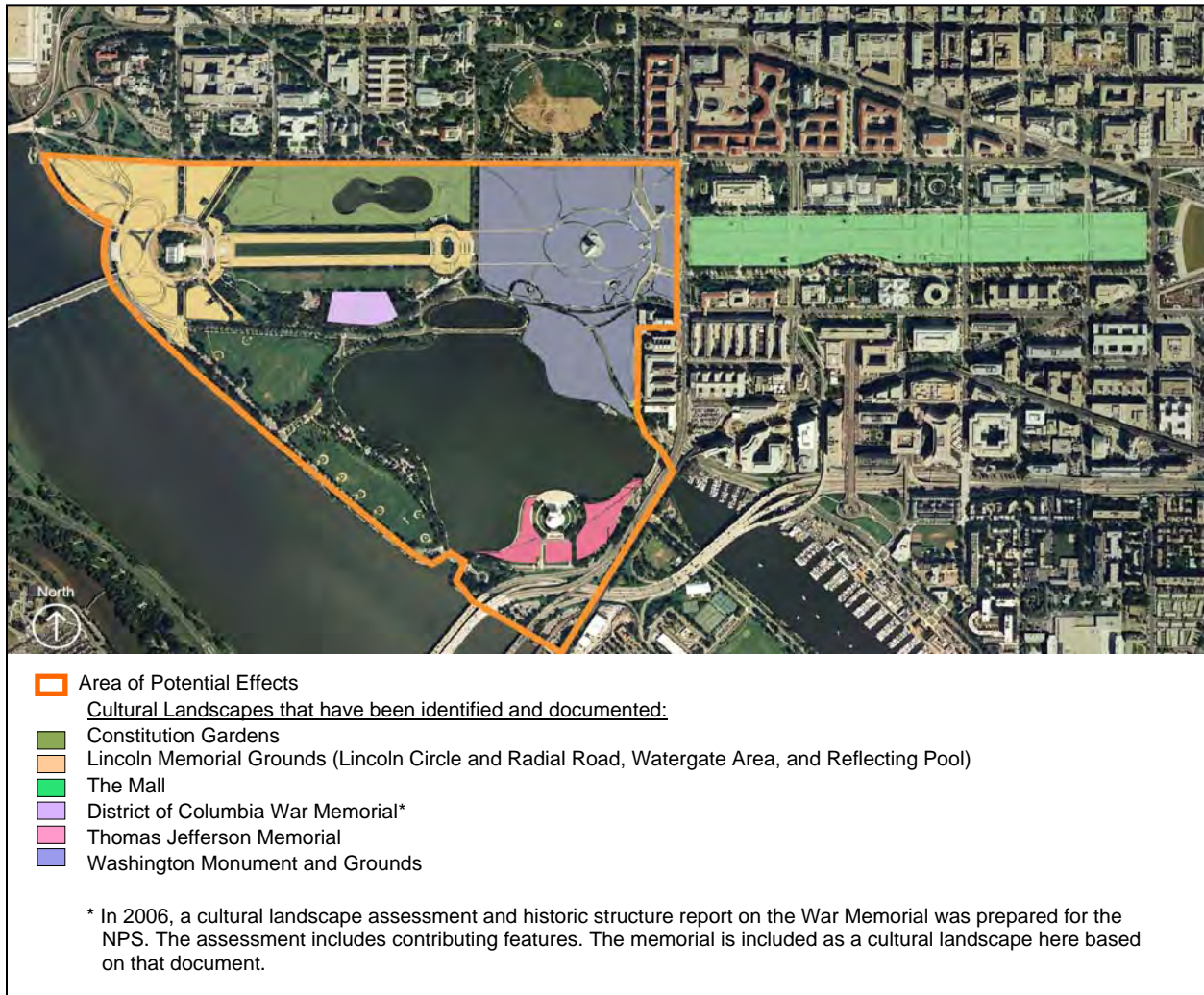
#### **CULTURAL LANDSCAPES**

Cultural landscapes, as defined in the NPS’s Preservation Brief 36: Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes (Birnbaum 1996), consist of “a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.”<sup>4</sup> The proposed alternatives have the potential to affect, directly or indirectly, four cultural landscapes: the Lincoln Memorial Grounds, Constitution Gardens, the District of Columbia War Memorial, and the Washington Monument and Grounds. All are parts of the National Mall, a term used by the NPS to describe the area between the U.S. Capitol on the east and the Potomac River at the Lincoln Memorial on the west. Preliminary analysis suggests that the undertaking will not affect the Jefferson Memorial cultural landscape, which also lies within the APE.

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<sup>4</sup> Several other National Park Service documents have informed the understanding of cultural landscapes as evaluated in this environmental assessment. They include NPS-28, “Cultural Resource Management Guideline”; National Register Bulletin no. 18, “How to Evaluate and Nominate Designed Historic Landscapes”; National Register Bulletin no. 30, “Guidelines for Evaluating and Documenting Rural Historic Landscapes”; and Preservation Brief no. 36, “Protecting Cultural Landscapes.”

Figure 3.6 - Cultural Landscapes within the APE



### LINCOLN MEMORIAL GROUNDS

In 1999, a Cultural Landscape Report (CLR) was completed for West Potomac Park, Lincoln Memorial Grounds (Joseph and Wheelock 1999). The Lincoln Memorial Grounds cultural landscape embraces 94 acres and includes the Reflecting Pool, Lincoln Memorial, the circular drive around the memorial, the Watergate, and a portion of the radial roads leading from the memorial. The Potomac River bounds the west side. The following text excludes the Watergate area west of the memorial from the discussion, since it seems unlikely to be affected by the undertaking.

A part of the development of Potomac Park and the National Mall by the McMillan Commission was the creation of a memorial to Abraham Lincoln. The Lincoln Memorial Commission, created in 1911, selected Henry Bacon as the architect of the memorial. Bacon praised the site of the memorial, stating that it “terminat[ed] the axis which united it with the Washington Monument and the Capitol, [and] has significance which that of no other site can equal” (Joseph and Wheelock 1999). The McMillan Commission’s concepts and drawings for the site, which envisioned “long tree-lined stretches of water,” similar to “formal landscapes at Versailles, Fontainebleau and Hampton Court,” directly informed Bacon’s cruciform plan for the Reflecting Pool and memorial (Joseph and Wheelock 1999). At the suggestion of Frederick Law Olmsted, Jr., landscape architect C.E. Howard was commissioned to complete plans begun by Olmsted and Bacon for the circle and the Reflecting Pool. Under the guidance of the CFA, the design for the Reflecting Pool was finalized in 1919 – 1920 (Joseph and Wheelock 1999)

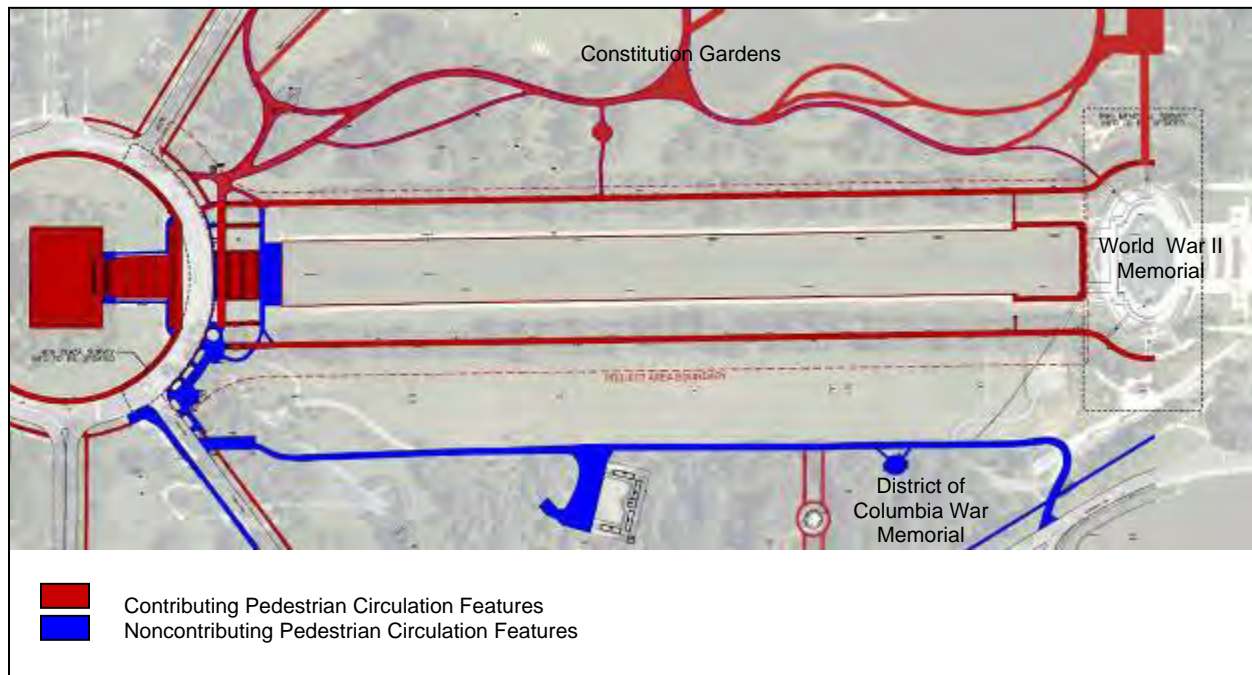
and the memorial was dedicated in 1922. The implemented designs eliminated aspects of the McMillan Plan's formal features, including the Reflecting Pool cross arm and several walks, in favor of a simpler arrangement thought to be more appropriate to the memorial's dignified Doric architecture. Landscaping of the grounds continued through the 1920s with the completion of the Reflecting Pool and flanking elm walks, installation of light standards, and the planting of elm trees along certain streets. The John Ericsson Memorial was constructed in a traffic circle south of the Lincoln Memorial in 1927. The early plans for the grounds were completed in 1932 along with the approaches to the Arlington Memorial Bridge (Joseph and Wheelock 1999).

During the 1920s the Lincoln Memorial Grounds were a popular area for active recreation, beginning with the insertion of a golf course northwest of the memorial in 1923, followed by the creation of a second course southeast of the memorial in 1924. By 1926, visitors to the grounds frequently used the Reflecting Pool for swimming, ice skating, and model boat racing. The 1930s brought a program of concerts to the river's edge, and in 1935 the first orchestra concert shell supported by a barge was constructed by the Watergate steps (Joseph and Wheelock 1999). A significant change in use occurred when temporary office and dormitory buildings were constructed on the grounds south of the Reflecting Pool in 1942 to meet the needs of the expanded government during the war. At the end of the war the NPS, National Capital Park and Planning Commission, and the CFA called for the removal of the temporaries and for passive recreation on the grounds, stating that the area south of Constitution Avenue (now Constitution Gardens) "is no place for active, noisy recreation" (Joseph and Wheelock 1999). Despite their efforts, the temporaries south of the Reflecting Pool were not removed until August 1964, as a result of the Mall Master Plan created by Skidmore Owings and Merrill in 1960. Temporary buildings north of the Reflecting Pool were not completely removed until 1970.

The Lincoln Memorial Grounds is a contributing site in the East and West Potomac Parks NRHP nomination (Bobezcko and Robinson 1998), and West Potomac Park (Reservation No. 332) contributes to the significance of the Plan of the City of Washington (L'Enfant – McMillan Plan) nomination (Leach and Barthold 1994). Under Criterion A of the NRHP, the memorial and grounds have been found to be nationally significant for landscape architecture and commemoration. They are also nationally significant for the topic of civil rights as the site of a 1939 performance by Marian Anderson and the 1963 March on Washington, during which Rev. Martin Luther King, Jr., delivered his "I Have a Dream" speech. These events are also recognized in the 1992 theme study by the NPS entitled "Civil Rights in America: Desegregation of Public Accommodations" (Garcia et al. 2004). The Memorial Grounds are significant under Criterion B for their association with Abraham Lincoln and Martin Luther King, Jr., and under Criterion C for the Beaux Arts shrine to Lincoln and the development of the grounds, all of which were influenced by notable architects and landscape architects such as Charles McKim, Frederick Law Olmsted, Jr., James Greenleaf, and Henry Bacon (Joseph and Wheelock 1999).

The CLR specified the features of the Lincoln Memorial Grounds that contribute to the landscape's significance. These include structures, circulation, vegetation, small-scale features, land use, and views and vistas. The Lincoln Memorial, its approachway, the John Ericsson National Memorial, the Reflecting Pool, and the steps from Lincoln Memorial Circle to the Reflecting Pool are contributing structures. Contributing circulation features include both vehicular and pedestrian elements. The CLR identified Lincoln Memorial Circle, 23rd Street, Henry Bacon and Daniel Chester French Drives, and Constitution Avenue as contributing vehicular circulation features. Contributing pedestrian circulation features include the elm walks, the Reflecting Pool steps, and the Reflecting Pool's granite coping, sidewalks on both sides of 23rd Street, NW, and Bacon Drive, sidewalks on the northeast side of French Drive and on the east side of 23rd Street, SW, sidewalks on both sides of Lincoln Memorial Circle, and on the south side of Constitution Avenue. (The concrete and cobblestone plaza linking the Reflecting Pool with the terraced steps that rise to Lincoln Memorial Circle was constructed during the 1970s and does not contribute to the landscape's significance, according to the CLR. There is also an asphalt walk on each side of the Reflecting Pool steps—one on the north and one on the south—that ascends to the circle; the CLR deemed these walks noncontributing.) Figure 3.7 shows the historic fabric around the Lincoln Memorial east plaza at the western end of the project area.

Figure 3.7 – Historic Fabric in the Western Portion of the Project Area



Contributing vegetation includes the historic evergreen plantings and grassy areas within Lincoln Circle; the elm trees along radial roads, around Lincoln Circle, along the Reflecting Pool's main walks, and along 17th Street; and the open grassy areas around the Reflecting Pool and the Ericsson Memorial. Identified as contributing small-scale features are the cast-iron, wood-slat benches, granite benches, the Twin-Twenty lampposts along 17th Street, 16- and 18-foot Washington Globe lampposts along the outer circle and the radial roads, concrete drinking fountains, memorial tree markers, and wire trash receptacles. The CLR determined that land-use activities, including commemoration and active and passive recreation, contribute to the significance of the Lincoln Memorial Grounds. The memorial landscape also includes numerous contributing views and vistas, the most prominent of which is the Mall axis between the memorial, the Washington Monument, and the Capitol. Fan-shaped views from the west side of the memorial to the Virginia shoreline also contribute to the site's significance. Other contributing vistas arise from linkages along roadways: from the memorial to Arlington House over the Arlington Memorial



Bridge (and its reciprocal view), along Parkway Drive, along the roads radiating from the memorial, and along 23rd Street both north to Constitution Avenue and south to the Ericsson Memorial.

The CLR indicates that the integrity of location, setting, and feeling of the Lincoln Memorial Grounds has been retained. Some alterations have been made to specific features, adversely affecting their integrity; however, the CLR states that the overall “design intent” has been retained. A compromise to the landscape’s integrity with respect to materials, workmanship, and association is caused by the new road systems, uses (concession structures and kiosks), materials, and secondary structures. The CLR states that “these effects can be reversed so that the historic character of the Lincoln Memorial Grounds is retained” (Joseph and Wheelock 1999).

### **CONSTITUTION GARDENS**

Encompassing 43.1 acres, Constitution Gardens is a park unit of West Potomac Park. It is bounded by Constitution Avenue on the north, 17th Street on the east, Henry Bacon Drive on the west, and the Potomac Park flood control levee to the south at the bottom of its slope near the outer elm walks north of the Reflecting Pool. The Washington office of the architectural firm of Skidmore, Owings, and Merrill designed Constitution Gardens in the early 1970s, using the 1902 McMillan Plan as its base plan. The northwest corner of Constitution Gardens is the site of the Vietnam Veterans Memorial (1982), which, as mentioned previously, is listed in the National Register. Subsequent additions to Constitution Gardens include the Memorial to the 56 Signers of the Declaration of Independence (1982), the Three Servicemen statue (1984), the Vietnam Women’s Memorial (1993), and an “In Memory” plaque commemorating those who served in the Vietnam War (2000/2006 replacement). The most recent addition to Constitution Gardens is the Garden of Remembrance, a feature associated with and located near the World War II Memorial (NPS 2008b).

Constitution Gardens is listed in the NRHP as a contributing site in the revised East and West Potomac Parks Historic District nomination. As this documentation was drafted in the late 1990s, it considers the significance of cultural landscapes, as well as traditional historic properties. In the East and West Potomac Park nomination, Constitution Gardens is found eligible under Criterion A, for landscape architecture and commemoration. Although less than 50 years old, the usual minimum age for NRHP eligibility, it “has achieved exceptional significance, first as a highly visible project celebrating the American bicentennial in the nation’s capital, and later as the landscaped setting for a number of national memorials” (Bobezcko and Robinson 1998). The Cultural Landscape Inventory (CLI), completed in 2008, recommends that Constitution Gardens be listed under Criterion C for the work of Skidmore, Owings, and Merrill and the architect Maya Lin, designer of the Vietnam Veterans Memorial. (NPS 2008b).

Character-defining features of the topography of Constitution Gardens include the gently rolling slopes, long berms, the small lake, a slope descending to the partially sunken Vietnam Veterans Memorial, and the flood control levee (NPS 2008b). Land-use features contributing to the cultural landscape of the Park cover a variety of activities including passive recreation, catch-and-release fishing, visiting the memorials, ceremonies at the Vietnam Veterans Memorial and Vietnam Women’s Memorial, demonstrations, and a citizenship ceremony at Overlook Terrace (NPS 2008b). The vegetation of Constitution Gardens illustrates a “varied [and] mostly native vegetative character,” which is in keeping with the original designs (NPS 2008b). However, the recent addition of the Garden of Remembrance is currently a noncontributing feature (NPS 2008b). The circulation of Constitution Gardens is defined principally through two loop walks and a large paved plaza known as Overlook Terrace. The circulation system is further enhanced through a network of narrower winding walkways and stairs. Important buildings and structures in the Park are the Lockkeeper’s House; stone terraces and a paved platform at the east end; the island in Constitution Gardens Lake and the 56 Signers Memorial on the island; the flood

control levee; the comfort station; the refreshment kiosk; the Vietnam Veterans Memorial, including the Three Servicemen Statue; and the Women's Vietnam Memorial (NPS 2008b). Nearly every direction to and from Constitution Gardens provides a character-defining view or vista, excluding the one towards Rosslyn, Virginia (NPS 2008b). The 6.75-acre lake in the eastern section is an important focal point of the Park's landscape, and a wide variety of small-scale features scattered throughout the Park are significant to the landscape's interpretation, including objects such as benches, light posts, plaques, flagpole, and directory stands.

#### **WASHINGTON MONUMENT AND GROUNDS**

Comprised of approximately 106 acres, the Washington Monument and Grounds cultural landscape is bounded by 14th and 17th Streets and Constitution and Independence Avenues. It was automatically listed in the NRHP in on October 15, 1966, under the provisions of the National Historic Preservation Act. A National Register nomination was accepted by NRHP on February 2, 1980. The site is listed under Criterion C in the areas of architecture, community planning and development, engineering, and landscape architecture, and its period of significance is designated as 1848 to 1889, the dates of its construction. The National Register documentation for the L'Enfant Plan for the City of Washington, D.C., accepted by the Keeper of the National Register on April 24, 1997, found the Monumental Core of Washington, of which the Washington Monument and Grounds are a part, to be nationally significant under Criterion A in the areas of politics/government, social history, and commemoration. The period of significance for the L'Enfant Plan nomination was designated as 1791 to 1943. Two other elements of the Washington Monument Grounds cultural landscape are listed individually in the National Register: the Charles Bulfinch-designed U.S. Capitol Gateposts, which were moved from the Capitol grounds to the intersection of 15th Street and Constitution Avenue in the 1870s. The Washington Monument was also listed as a National Historic Civil Engineering Landmark in 1981.

Since none of aforementioned documentation adequately documented landscape features of the monument grounds, the National Park Service completed a cultural landscape inventory in 2009, which recorded all contributing characteristics and features. The CLI recommended that, if the National Register documentation is updated, the site would be eligible under Criterion A, in the areas of politics/government, social history, recreation and commemoration; Criterion C, in the areas of architecture, community planning and development, engineering, and landscape architecture; and Criterion D, as it has yielded, or is likely to yield, information important to American prehistory or history. The CLI designated the period of significance for the Washington Monument Ground cultural landscape as 1791 to 1943 – from the initial conception of the National Mall by Pierre Charles L'Enfant to the construction of the Thomas Jefferson Memorial. The landscape retains integrity for its period of significance. (NPS 2009f)

The Washington National Monument Society, founded in 1833, held a design competition for the Washington Monument, which was won by the noted architect Robert Mills. The site for the memorial, as specified by the L'Enfant Plan, was intended to be the intersection of the east-west axis through the Capitol with the north-south axis through the White House. The unstable nature of the ground in this location resulted in the siting of the monument slightly southeast of the intended spot. Construction of Mills' design began in 1848; although the monument was nowhere near completion, work stopped in 1854. Construction restarted soon after the Civil War. The final monument, slightly altered from Mills' original intent, was completed in 1888. Numerous changes have been made to the circulation, vegetation, and boundaries since completion of the monument in 1888, (JMA 2003). Most recently, the grounds were improved to provide un-intrusive security measures in 2005. Designed by the Olin Partnership, the improvements included a graded system of walled terraces and pathways that form overlapping rings around the monument (NPS 2009f).

The CLI re-evaluated the significance of individual features of the Washington Monument Grounds cultural landscape determined numerous elements in the categories of views and vistas, buildings and structures, circulation vegetation, topography, land use, and spatial organization to contribute to the landscape's significance. Since the Reflecting Pool rehabilitation work does not physically impact the Washington Monument Grounds, the contributing features of the monument grounds potentially impacted by the Reflecting Pool work are limited to views and vistas. Contributing views and vistas for the monument grounds cultural landscape that may be impacted include views from the top of the monument and from the grounds toward the Lincoln Memorial (NPS 2009f).

#### **DISTRICT OF COLUMBIA WAR MEMORIAL**

Constructed in 1931, the District of Columbia War Memorial honors more than 26,000 District residents who served in World War I. The memorial, a circular, marble, Doric temple, is located on an open stretch of ground south of the Reflecting Pool near Independence Avenue, SW, and is surrounded by a grove of trees. Designed by architect Frederick H. Brooke (with associated architects Nathan C. Wyeth and Horace W. Peaslee), the memorial also functioned as a bandstand. A historic structure report and cultural landscape assessment for the memorial, which is also a contributing feature of the East and West Potomac Parks Historic District, was prepared for the NPS in 2006. A Cultural Landscape Inventory was completed in 2009 (NPS 2009g), identifying identified contributing features of the memorial and its landscape.

The cultural landscape assessment addressed the memorial itself and a 600-foot-wide site that included a portion of the grove of trees on either side of the memorial. The assessment noted that the memorial's landscape should include the wooded area between the public restrooms on the east and the USPP Stables on the west. In addition to the memorial itself, the spatial organization of the landscape—the Doric temple sited on a north-south axis and flanked by trees on the east and west—contributes to the memorial's significance. Other contributing features of the memorial include the flagstone walks around the temple and extending north and south from it, the mature deciduous and evergreen trees surrounding the memorial, views through the openings in the grove to the north and south and through the wooded landscape on the east and west, the level topography, and its commemorative use (Waite 2006).

## Aesthetics and Visual Resources

The key factors and considerations for the aesthetics and visual resources of the affected environment include the following categories, which provide a framework for evaluation:

- *Visual Character (including salient landscape elements and built features):* The visual character of a site, in very general terms, is like a mental snapshot of the place. It embodies the defining and most memorable site features. The most salient visual features in the project area are the Lincoln Memorial, the Reflecting Pool, and World War II Memorial; all landscape elements (such as the elm walks and open lawns) and built features (such as the lower approachway stairs and landings) were designed to be deferential to these monumental features.
- *Views and Vistas:* For this analysis, the term “vista” defines views of primary importance that were specifically planned, designed, and implemented. The term “view” describes those unplanned views that resulted from the construction of other features. Vistas in the project area have been present since the earliest plans for Washington, D.C., and have been maintained throughout the city’s development. In the project area, the patterns of circulation, walkways, and open spaces enable views to and from key cultural resources, such as between the Washington Monument and the Lincoln Memorial.

The three areas where improvements are proposed have distinct visual characters, but all are consistent with the character of the National Mall. Each is described separately below.

### ELM WALKS

There are two elm walks located to the north and south of the Reflecting Pool. These walks reinforce the symmetry of the project area along the centerline of the Reflecting Pool. Each walkway is set back approximately 88 feet from the Reflecting Pool.

#### *Visual Character*

Each elm walk is essentially an allée, an element of French formal landscapes that is a long, linear promenade lined with trees. The mature elm trees that flank each side of the path are spaced at regular intervals and are set back approximately 10 feet from the walk. The paths are generous in width, with light fixtures, benches, and trash receptacles. The surface of the walks is asphalt. The general visual character is formal in nature, underscored by the repetition of the elements and the oblique views toward the Reflecting Pool. The visual character of the elm walks is shown in Figures 3.8 and 3.9.

Figure 3.8 – Looking west from the centerline of the south elm walk



Figure 3.9 – Looking west along the north elm walk



*Views and Vistas*

There are two important views and vistas from the elm walks. The perspective long views down the elm walks are primarily defined by the repetition of mature elm trees; the vistas toward the Reflecting Pool and the Lincoln Memorial that are framed by the elm trees are also important.

**REFLECTING POOL**

The Lincoln Memorial Reflecting Pool is located in the center of the project area. It is a shallow, rectangular pool of water surrounded by a 30-inch-wide granite coping around its perimeter. The east end terminates at the World War II Memorial (See Figure 3.10). At the east end, the Reflecting Pool bemps out into a square area that is surrounded by a 10-foot concrete walkway; it is visually associated with the adjacent World War II Memorial where granite is used throughout.

Figure 3.10 – Aerial photo of the Reflecting Pool



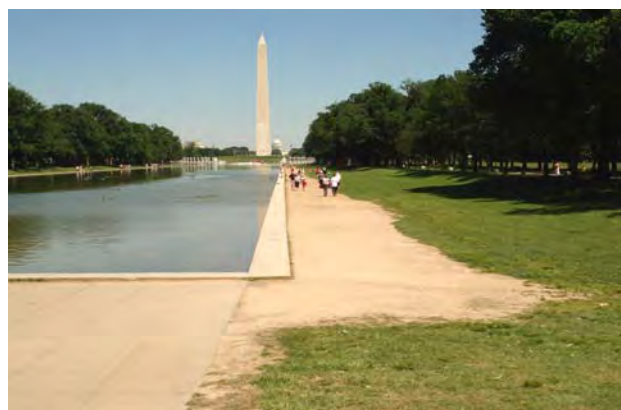
*Visual Character of Site*

The Reflecting Pool is a formal element within the axis of the National Mall. Though not perceptible on the ground, the axis of the Reflecting Pool is skewed approximately one degree counterclockwise. The area is characterized by an open lawn surrounding the Reflecting Pool, framed by the rows of mature elms to the north and south, the World War II Memorial to the east, and the Lincoln Memorial and east plaza to the west. The two worn dirt paths are strong visual elements around the Reflecting Pool. Figures 3.11 and 3.12 show these paths.

Figure 3.11 – Existing worn dirt path along the north edge of the Reflecting Pool



Figure 3.12 – Existing worn dirt path along the south edge of the Reflecting Pool



### *Views and Vistas*

The Reflecting Pool is associated with several prominent vistas primarily associated with the Lincoln Memorial and its cultural landscape. Many of these are described under the Lincoln Memorial. However, it is important to note that the Reflecting Pool itself is a salient feature of these views. The surface of the water is an important characteristic to the surrounding vistas, particularly for its ability to capture the reflection of the Lincoln Memorial and the Washington Monument. Consequently, the depth, quality, and relative stillness of the water are maintained to preserve this vista.

#### **LINCOLN MEMORIAL**

The Lincoln Memorial is a limestone and marble structure located at the western edge of the project area. It is surrounded by the Lincoln Memorial Circle, which has been closed to vehicular traffic on its east side since the 1970s. The upper approachway, consisting of the steps and landings, is a popular seating area for visitors to the area and is a place to appreciate the views toward the monuments and memorials to the east. Past the circle is the lower approachway, the stairs and landings which lead down the Reflecting Pool. Figure 3.13 shows the lower approachway to the Reflecting Pool. At the top of the lower approachway, there is another row of temporary concrete barriers, which were installed in 2008, replacing the Jersey barriers that were in place since 2001 (See Figure 3.14).

Figure 3.13 – Lower approachway to the Reflecting Pool

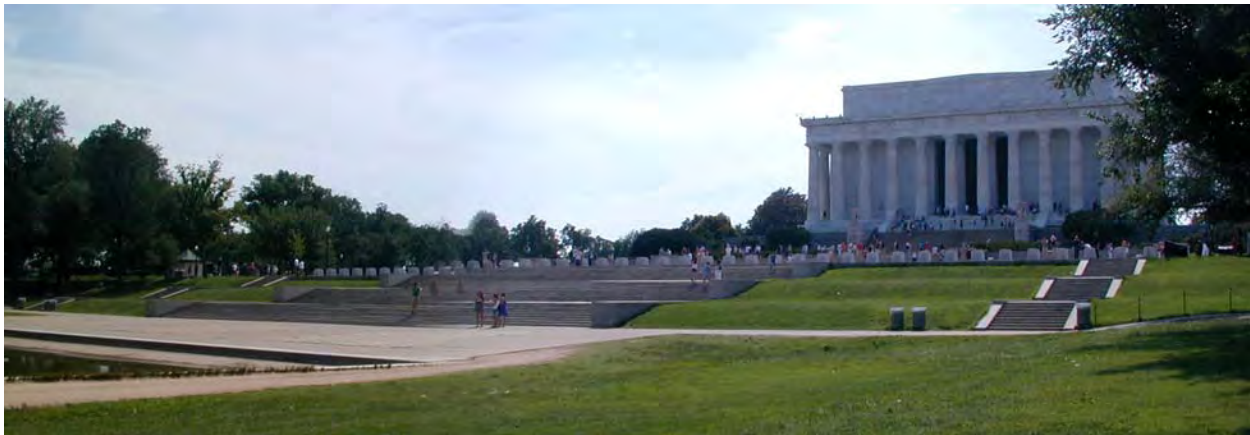


Figure 3.14 – Existing temporary concrete barriers at the center section of the Lincoln Memorial east plaza



*Visual Character of Site & Views and Vistas*

The image of the area is anchored by the Lincoln Memorial; the visual character is grand and formal, with a repetition and symmetry of both the landscape elements and site features that underscore the visual prominence of the Lincoln Memorial and grand axis linking it to the monuments and memorials to the east. The primary vista in this project area is from the Lincoln Memorial toward the Washington Monument (See Figures 3.15 and 3.16). There are secondary views toward the Lincoln Memorial from points around Constitution Gardens, the elm walks, and the Reflecting Pool area.

The Reflecting Pool is associated with several views and vistas that are contributing features of the Lincoln Memorial Grounds Cultural Landscape (NPS 1999). These include:

1. Mall axis vista from and to the Lincoln Memorial to Washington Monument to U.S. Capitol
2. Vista from the Lincoln Memorial to Arlington House across Arlington Memorial Bridge (also reciprocal view)
3. View from and to Parkway Drive
4. Vista from radial roads (including Henry Bacon Drive and Daniel French Drive) to the Lincoln Memorial and along radial roads from the Lincoln Memorial
5. Vista from the Lincoln Memorial raised terrace south to the Ericsson Memorial and north to Constitution Avenue, along 23rd Street NW axis
6. Fan-shaped vista from the Lincoln Memorial west to the Virginia shoreline (also opposite view from the shoreline to the Lincoln Memorial)

There are also two views currently considered to be non-contributing features:

1. View from and to the Vietnam Veterans Memorial to the Lincoln Memorial
2. View from and to the Korean War Veterans Memorial to the Lincoln Memorial

Figure 3.15 – View from east end of the Reflecting Pool looking west towards the Lincoln Memorial



Figure 3.16 – View from Lincoln Memorial to the Washington Monument



### **WEST POTOMAC PARK, SOUTH OF INDEPENDENCE AVENUE SW**

The southern part of the project area between the Tidal Basin and the Potomac River is defined primarily by the recreational fields and tree-lined streets. It is a park-like setting with mature vegetation and well maintained turf areas. Throughout this portion of the project area, there are extensive views westward across the Potomac River toward portions of Virginia. The Franklin Delano Roosevelt Memorial and the Thomas Jefferson Memorial are located within this portion of the project area.

## **Water Resources**

For the purposes of this document, the term “water resources” includes the water supply (or source), water quality, and water discharge in the Reflecting Pool and adjacent water bodies.

Three water bodies are discussed in some depth in this section: the Reflecting Pool itself, the Tidal Basin and the Potomac River, as well as some discussion of the fountain on the World War II Memorial, which is adjacent to the Reflecting Pool. The Reflecting Pool is 2,029 feet long and 167 feet wide. It is approximately 18 inches deep around the perimeter and slopes to a depth of 30 inches in the middle. The water depth is maintained at several inches below the surface of the granite coping, yielding a total water volume of 6.5 million gallons. Two other nearby bodies of water, the Tidal Basin and the Potomac River, are discussed as they either currently receive discharge or play a role in the action alternative options for the Reflecting Pool rehabilitation.

### **REFLECTING POOL WATER SUPPLY AND LOSS**

Currently, the Reflecting Pool is fed by two water supply lines, located along its north edge. During heavy or sustained rains, several grates provide an overflow system.

The water supply is furnished by the DC WASA, the entity responsible for finished water distribution to Washington, D.C. Approximately 60,000 to 80,000 gallons per day (gpd) of water is lost due to evaporation and leakage around the perimeter of the Reflecting Pool (ABE 1987). Differential soil settlement has caused shifting in the foundation slab and consequently, structural deficiencies and cracks have enabled substantial leakage. Although numerous repairs have been made to the structural system over the last 90 years, the deficiencies and cracks continue to cause significant leakage from the Reflecting Pool.

### **REFLECTING POOL WATER QUALITY**

To preserve the appearance of the Reflecting Pool, the NPS takes several measures to maintain its water quality including water treatment, debris removal, and pool cleaning.

The water used to fill the Reflecting Pool is potable municipal water. DC WASA finishes its water with chloramine, which is a longer-lasting disinfection compound than chlorine and which prevents contamination. It would not have long-lasting disinfection properties once in the Reflecting Pool, however. Orthophosphates are added to the water to prevent the leaching of lead from water pipes and to contribute to nutrient conditions that support algal growth. The NPS also treats the Reflecting Pool with a proprietary algaecide that is organically certified by the Organic Material Review Institute.

Solid and organic waste collects in the Reflecting Pool and originates from a variety of sources including visitors, wildlife (particularly geese and ducks), rain events, and prevailing winds. To remove floating debris, such as leaves, trash, sticks, and algae, the NPS uses manual tools to skim the surface. To remove organic waste and maintain the overall condition of the Reflecting Pool, it is cleaned once or twice annually. The practice includes draining, scraping, washing, and refilling the Reflecting Pool, a process which takes approximately four days (ABE 1987). The Reflecting Pool is drained through eight separate grates that eventually drain into a line that discharges to the Tidal Basin. The NPS removes solid waste that has accumulated at the bottom of the Reflecting Pool by truck; the final step of the cleaning involves scraping and washing the inside of the Reflecting Pool prior to refilling.



**WORLD WAR II MEMORIAL FOUNTAIN**

The World War II Memorial fountain occasionally receives a small influx of water from the Reflecting Pool due to overtopping by wind forces. The frequency of these occurrences is minimized because the Reflecting Pool is maintained at a level that is several inches below the surface of the coping. Nevertheless, during excessive storms with prolonged wind surges, there is an occasional cross contamination of water. The aesthetic appearance of the water feature in the World War II Memorial is an essential aspect of its design and therefore, it is important to maintain the clarity and quality of its water. The water in the Reflecting Pool tends to have a higher amount of suspended sediment than the World War II Memorial fountain and can differ in color and clarity. The Reflecting Pool is a source for algae inoculation into the World War II Memorial fountain.

**TIDAL BASIN**

The Tidal Basin is affected since it is the receiving water body for the drainage volume of both the Reflecting Pool and the fountain in the World War II Memorial, and is considered as either a source or receiving water for the action alternative options for the Reflecting Pool. Although a large amount of solid waste is removed from the Reflecting Pool through skimming prior to drainage, the water potentially contains contaminants such as residual chloramine, algae, and organic waste that can create or exacerbate water quality problems in the Tidal Basin.

The Tidal Basin, a partially man-made body of water adjacent to the Potomac River that covers approximately 6,500 square feet and averages a depth of 6.5 feet, was conceived in the late 19th century in part as a way of flushing sediments through the adjacent Washington Channel, a man-made channel and harbor draining to the confluence of the Anacostia and Potomac Rivers a short distance downstream. The basin contains two sets of gates (replaced in 2008) that are designed to capture approximately 250 million gallons of water flowing in from the Potomac at high tide and then discharge it through another set of gates down the shipping channel on the ebb tide (NPS 2009b). Although this has worked to some extent, there are problems with water quality in the Tidal Basin, partially due to its low flow, lack of flushing, and shallow nature. The combination of these factors means that the Basin has a tendency to warm during the summer months, which can exacerbate problems with bacteria, dissolved oxygen and other parameters of concern. The Tidal Basin cannot currently regularly meet the designated use of primary contact recreation, and as a result has been listed on the CWA's Section 303(d) list as impaired for both fecal coliform and organic compounds, requiring that Total Maximum Daily Loads (TMDL) be developed for these pollutants. The Tidal Basin and Washington Channel was also listed for pH in 2002. The Tidal Basin receives input from NPS parkland, which is mostly lawn and landscaping (many of the famed cherry trees ring the basin), storm sewers and waterfowl (District of Columbia 2004b). In addition to these stormwater discharges and the drainage of the Reflecting Pool, the water quality within the basin is influenced by the Potomac River.

**POTOMAC RIVER**

As with the Tidal Basin, a variety of natural and urban influences impact water quality in the Potomac River. The Potomac River originates in primarily agricultural and forested land upstream, but flows through the highly urbanized Washington, D.C., region. The river is impacted by such pollutants as nutrients, metals, chlorinated industrial compounds, and volatile organic compounds, as well as organic waste and bacterial loads discharged from CSOs and stormwater runoff.

The Potomac River was the subject of study by the U.S. Geological Survey National Water Quality Assessment (NAWQA) Program in the 1990s as part of an effort to identify water quality problems and develop an understanding of the effects of human actions and natural factors on water quality conditions, which provided a wealth of information on water quality in the Potomac River (Ator et al. 1998).

### POTOMAC RIVER NUTRIENTS

Although concentrations of nitrogen and phosphorous in the Potomac River are generally elevated above concentrations naturally occurring in the environment, in the majority of cases elevated nutrient concentrations do not exceed drinking water standards, and thus do not pose a threat to human health or wildlife. The NAWQA study found that ammonia concentrations in the Potomac River are generally low.

Inorganic nutrients typically comprise a greater portion of total nitrogen and phosphorus concentrations than does the organic fraction of these nutrients, except during high flow conditions. As indicated in this table, both agricultural (i.e., animal manure) and developed (i.e., commercial fertilizers) land uses contribute substantial amounts of nutrients to the Potomac River (Ator et al. 1998).

Table 3.7: Sources of Nitrogen and Phosphorus in the Potomac River Basin

	Nitrogen (%)	Phosphorus(%)
Atmospheric Deposition	32	0
Wastewater Discharges	12	4
Septic Systems	<2	3
Animal Manure	29	45
Commercial Fertilizers	26	48 Percent

Reproduced from USGS Ator et al. 1998.

### POTOMAC RIVER METALS AND ORGANIC COMPOUNDS

There are several organic compounds that are present in the streambed sediment of the mainstem Potomac River, particularly where the river flows through heavily urbanized areas such as Washington, D.C. Many of these chemicals are legacy residuals of compounds, such as chlordane, Dichlorodiphenyltrichloroethane (DDT), and polychlorinated biphenyls (PCBs) that have been banned for many years or decades. These compounds take a long time to degrade, and persist in the environment for many years after they are no longer used. Concentrations of metals such as mercury and lead are also detected in the Potomac River, particularly in and around the Washington, D.C., area. These compounds accumulate in fish tissue and can have adverse effects on aquatic life in the river, as well as human health (Ator et al. 1998). A human health fish-consumption advisory has been posted for fish caught in the Potomac River in Washington, D.C.

The District has jurisdiction over the Potomac River and has listed this section of the river for organics and mercury in its CWA Section 303 (d), requiring that TMDLs be developed for these pollutants. Because organics and mercury are usually concentrated in the sediments, and less in the water column, they would not affect water quality in the Reflecting Pool if the river is used as a source.

### POTOMAC RIVER BACTERIA

The Potomac River receives bacterial loading from a number of sources, including the CSOs discussed previously, direct inputs from wildlife, particularly waterfowl, and stormwater runoff that often contains pet and wildlife waste.

Much of the sanitary sewer system in the District was constructed in the late nineteenth century, when it was common to combine sanitary pipes with stormwater drainage pipes. Although more modern approaches have separated the storm drains and the sanitary sewers (including in the area around the Reflecting Pool), much of the city is still served by these combined sewers. During heavy rain events, the wastewater treatment plant cannot handle all of the flow and the overflow is discharged into the Potomac River and its tributaries. The closest CSO outfall to the project area is just north of Memorial Bridge. The District and DC WASA are in the process of implementing an LTCP that includes large underground storage facilities and other measures that will reduce surface runoff of stormwater and significantly reduce or eliminate the number of overflow events annually.

The Potomac River has a high assimilative capacity and is generally better able to attain water quality standards for bacteria and other pollutants than the Tidal Basin. However, although the river has been listed as impaired for bacteria and a TMDL has been developed (DC 2002), the implementation of stormwater plans and programs and the LTCP should help reduce problems with bacteria in the Potomac River.

## Soils

The project area was originally open water at the mouth of Tiber Creek, but was filled in late 19th century, primarily to maintain the navigation channel of the Potomac River. Currently, the entire landmass consists of landfill, composed of dredged silt from Potomac River and fill brought in from offsite. Figure 3.17 shows the soil map of the project area. According to this map, the majority of soils are udorthents, a soil type characterized by earthy fill material that has been placed in poorly to excessively drained soils on uplands, terraces, and floodplains of the Coastal Plain and Piedmont. The fill is characterized by elastic silt with sand and is variable in depth. Permeability, runoff, and internal drainage also tend to be quite variable (USDA, 1976).

As part of this project, the NPS commissioned a geotechnical analysis. Based on the resultant test borings, a typical soil profile is shown in Table 3.8. Along the main thoroughfares between the World War II Memorial and the Lincoln Memorial, visitors have created several social trails where the topsoil has been compacted and the turf has been worn into dirt paths. These social paths flank the Reflecting Pool and run parallel to the elm walks. Figure 3.18 shows these social trails. As a result of constant use by visitors, the project area is currently subject to continued erosion and compaction of the soils along the social trails.

Figure 3.17 – Soil Map of the Project Area



Table 3.8 – Typical Soil Profile

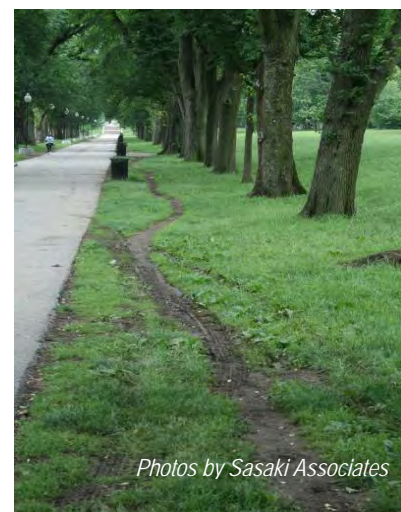
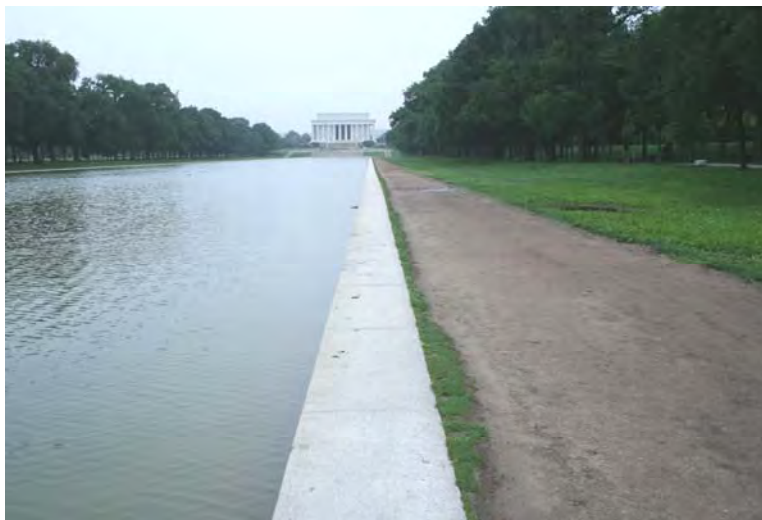
Elev (avg)	Depth	Description
10 feet	Ground Level	
9.8	3-4 inches	Topsoil
1.5	8-9 feet	Fill
-30 to -35	30-45 feet	Elastic Silt
-33 to -40	Varies	Bedrock

Source: NPS 2009d

### WEST POTOMAC PARK, SOUTH OF INDEPENDENCE AVENUE SW

This portion of the project area includes numerous turf recreational fields that are used throughout the year. As a result, the soils in this area are heavily compacted.

Figure 3.18 – Social Trails in the Project Area



Photos by Sasaki Associates

## Vegetation

### GENERAL CHARACTER

The general vegetative character of the National Mall is that of designed landscape composed of lawn and shade trees typical of the greater National Capital Region. Prevalent features in the region include a complex of upland, floodplain forest, tidal marsh communities, frequently flooded river shores, and areas of open park-like habitat with maintained ornamental vegetation (NPS 2006a). The vegetation found within the National Mall includes more than 2,000 American elm trees (*Ulmus americana*) that line the streets. Yoshino cherry trees (*Prunus x yedoensis*) ring the Tidal Basin. West Potomac Park, which includes the parkland that extends south of the Reflecting Pool from the Lincoln Memorial to the Washington Monument Grounds (Monument Grounds) to the Potomac River, contains landscaped open lawns, turf, and mature trees.

There are no plant species identified as threatened or endangered within the areas affected by the proposed Reflecting Pool improvement alternatives or in the surrounding area.

### ELM WALKS

The vegetation along the elm walks adheres to Olmsted's original design, in which he specified the placement of individual trees in positions approximately 25 feet apart to establish formal vistas in connection with the Lincoln Memorial (NPS 1999). Although he specified English elms, the area today is characterized by Dutch elm (*Ulmus hollandica*), Scotch elm (*Ulmus glabra*), and Smoothleaf elm (*Ulmus carpinifolia*).

Between the north elm walk and Constitution Gardens, the predominant landscaping consists of native trees such as Eastern white pine (*Pinus strobus*) and shrubs planted in an irregular pattern. In addition, there are clusters of red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), black walnut (*Juglans nigra*) sweetgum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), American beech (*Fagus grandifolia*) Northern red oak (*Quercus rubra*), European beech (*Fagus sylvatica*), and flowering dogwood (*Cornus florida*) as well as the non-native Japanese flowering crabapple (*Malus floribunda*) and the non-native hybrid Katherine crabapple (*Malus katherine*),

Between the south elm walk and Independence Avenue, large open lawns are used for recreational playing fields.

Along the elm walks, there are social trails that have resulted in worn turf. These are shown in Figure 3.18.

### LINCOLN MEMORIAL EAST PLAZA

To the west of the project area, groves of American elm and Smoothleaf elms encircle the Lincoln Memorial and the Vietnam Veterans and Korean War Veterans Memorial kiosks.

### REFLECTING POOL

The Reflecting Pool is a formal element within an open space, situated in an open lawn. To a large extent, the worn dirt paths that flank its edges preclude the growth of any vegetation. As a result, the turf is worn into wide dirt paths, approximately 14 feet around the north and south edges of the Reflecting Pool.

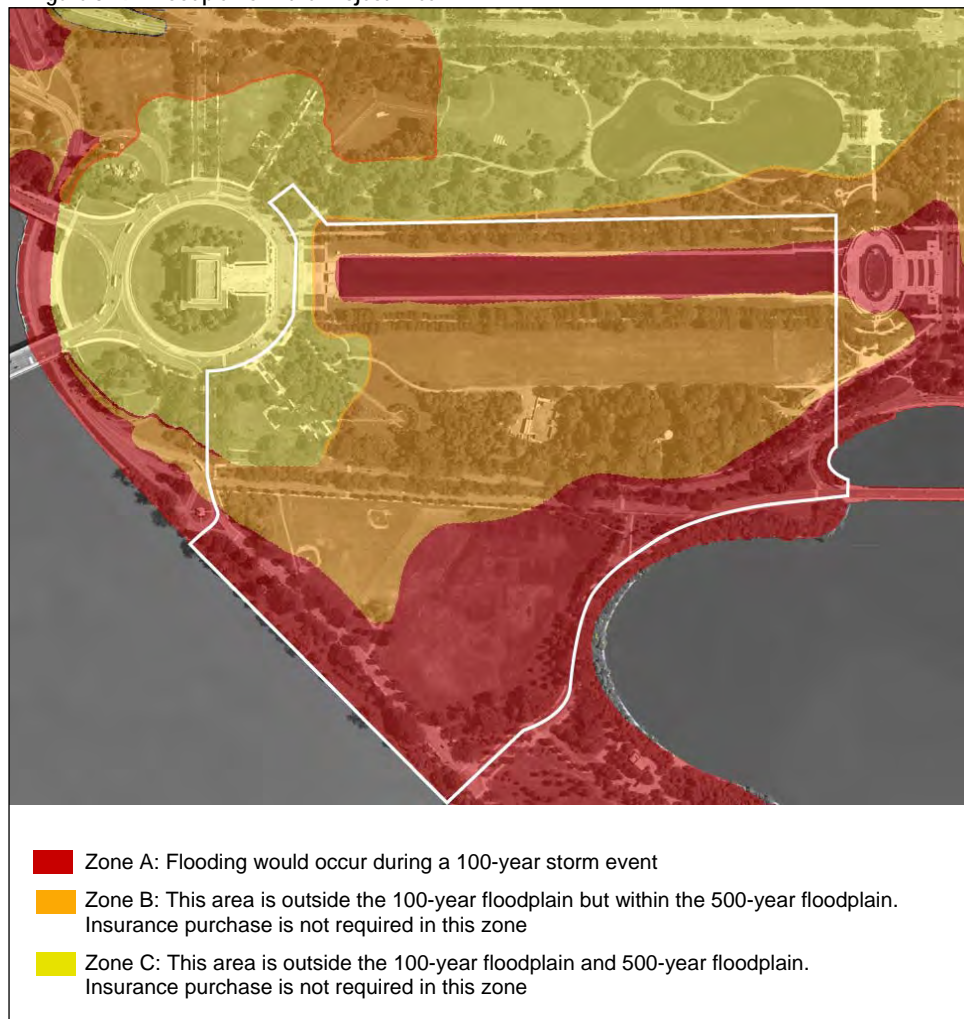
### WEST POTOMAC PARK, SOUTH OF INDEPENDENCE AVENUE SW

This portion of the project area includes numerous grass recreational fields that are used throughout the year resulting in worn turf. There are mature elm trees that line Ohio Drive SW and populate the area between the roadway and the Potomac River. Numerous flowering Japanese cherry trees encircle the Tidal Basin to the east of the project area.

## Floodplains

Federal projects are guided by *Executive Order 11988, Flood Plain Management*, which states that “each agency shall provide leadership and shall take action to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains.” Under *Executive Order 11988*, the NPS is responsible for evaluating the potential effects of any actions proposed within a floodplain and proposing mitigation to avoid adverse effects resulting from development within a floodplain. According to Federal Emergency Management Agency (FEMA) mapping, the majority of the project area is in the currently designated as Zone A, within the 100-year floodplain. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood<sup>5</sup>. The areas to the north and southwest are designated as Zone B, within the 500-year flood zone (FEMA 1985). Figure 3.19 illustrates the existing flood zones.

Figure 3.19 –Floodplains in the Project Area



<sup>5</sup> A 100-year flood is a flood that has a one percent chance of being equaled or exceeded in magnitude in any given year; it is not a flood that occurs once every 100 years.

## Traffic and Transportation

This section presents an overview of the existing and future transportation system serving the Reflecting Pool and surrounding area. This assessment is based primarily on relevant information obtained through various document reviews including data analyses from studies in the vicinity of the proposed project.

### ROADWAYS AND TRAFFIC

The Reflecting Pool and surrounding area is situated between 17th Street, 23rd Street, Independence Avenue SW and Constitution Avenue NW on the National Mall within the District's monumental core. Regional access to the site is served by the I-66 and I-395 freeway systems and several principal arterials that radiate from the city core to suburbs within Maryland and Virginia. Various sections of adjacent roadways are proposed for temporary partial closure during off-peak hours during construction of this project, and these locations are discussed in greater detail in Chapter 4.

Constitution Avenue and Independence Avenue function as major gateways to the District Downtown Area and are classified as principal arterial roadways by the District Department of Transportation (DDOT) (DDOT 2006). The adjacent local roadways that described on the following pages are all also considered to be principal arterial roadways. The regional transportation system perspective is shown in Figure 3.20.

Figure 3.20 –Regional Transportation System



**CONSTITUTION AVENUE NW**

This eight-lane, two-way roadway runs east to west along the northern frontage of the National Mall. It is designated U.S. 1/ U.S. 50 east of 14th Street. West of 14th Street, it is U.S. 50 and connects directly with the I-66 freeway system. This avenue provides access to the National Mall and a number of federal buildings, museums, and other visitor attractions serving a large number of commuters and tourists. Curbside parking is provided along both sides of Constitution Avenue NW, with restrictions during the morning and afternoon peak periods. This roadway serves an Average Daily Traffic (ADT) volume of 41,555 vehicles per weekday between 23rd Street and 17th Street (DDOT 2007) with significantly lower volumes at nights and on weekends. The posted speed limit is 25 miles per hour (mph).

**INDEPENDENCE AVENUE**

This six-lane divided roadway runs east to west along the southern boundary of the National Mall and provides access to a number of federal buildings, museums, and other visitor attractions and has stopping and standing restrictions at all times. It serves an ADT volume of 21,800 vehicles on weekdays between Ohio Drive SW and 17th Street, with fewer vehicles at night and on weekends (DDOT 2007). Parking is restricted along 23rd Street, and the posted speed limit is 25 mph.

**23RD STREET NW**

This four-lane roadway runs north to south between Independence Avenue and Constitution Avenue NW to the west of 17th Street NW. It is bisected by the Lincoln Memorial between Independence Avenue SW and Constitution Avenue NW. No through traffic is permitted on the eastern half of Lincoln Memorial Circle, which was closed to vehicular traffic between Daniel French Drive and Henry Bacon Drive in 1972. Ramps to and from the Arlington Memorial Bridge, the Rock Creek and Potomac Parkway, and the I-66 Theodore Roosevelt Memorial connect to 23rd Street and Constitution Avenue and provide access from portions of northern Virginia to major federal and nonprofit agencies, George Washington University, art galleries, and other commuter and tourist attractions to the north and east. It serves an ADT volume of 24,600 vehicles north of Constitution Avenue on weekdays, 22,600 vehicles immediately south of Constitution Avenue (DDOT 2007), with fewer vehicles at night and on weekends. Parking is restricted along 23rd Street, and the posted speed limit is 25 mph.

**HENRY BACON DRIVE NW**

Henry Bacon Drive NW is a four-lane undivided roadway that runs diagonally (southwest to northeast) between Constitution Avenue and the Lincoln Memorial Circle. This roadway is under NPS jurisdiction and is considered a principal arterial. It serves ADT volumes in the range of 17,400 on weekdays, with appreciably less traffic on weekends and public holidays. The posted speed is 25 mph (NPS 2006c).

**DANIEL FRENCH DRIVE SW**

This three-lane, single directional principal roadway is located to the southwest of the project area and connects Lincoln Memorial Circle and Independence Avenue SW. It is also under NPS jurisdiction and serves an ADT volume of 3,100 vehicles on weekdays (DDOT 2007), with fewer vehicles at night and on weekends. Tour buses and taxi cabs use this roadway for visitor pick-up and drop-off.

**OHIO DRIVE SW**

Ohio Drive is under NPS jurisdiction and runs along the west edge of West Potomac Park, providing a vehicular connection to the Thomas Jefferson Memorial, East Potomac Park, and Hains Point via the Inlet Bridge (NPS 2009e). Ohio Drive also provides ample parking along the length of the roadway which serves the recreational fields within West Potomac Park and the picnic and fishing areas within East Potomac Park. It is not a direct through route and therefore does not attract significant levels of through traffic.

### **WEST BASIN DRIVE SW**

West Basin Drive is under NPS jurisdiction and runs along the western edge of the Tidal Basin. It only serves one-way, northbound traffic connecting Ohio Drive with Independence Avenue SW (NPS 2009e).

### **PUBLIC TRANSPORTATION**

The project area is situated within an area that is generally well served by the Washington Metropolitan Transportation Authority (WMATA) Metrobus and Metrorail public transportation systems.

The closest Metrorail stations to the project area are Smithsonian (Orange/Blue line), located approximately one mile to the east, and Foggy Bottom (Blue/Orange), located approximately one-half mile to the north.

Several buses also serve the project area. Seven WMATA Metrobus lines run along Constitution Avenue and the DDOT District Circulator provides bus service along Constitution Avenue NW, Independence Avenue SW, and 17th Street (DDOT 2007a).

### **TOUR BUSES**

Tour bus operations are concentrated within the National Mall between the Lincoln Memorial and the U.S. Capitol, often with separate loops for other visitor destinations such as Arlington National Cemetery and the National Cathedral. Major routes serve the perimeter of the project area.

Local tour bus companies include the NPS Tourmobile and DC On-Board Old Town Trolley and the double-decker Open Top Sightseeing. The Tourmobile serves the Lincoln Memorial and surrounding area, Franklin Delano Roosevelt and Thomas Jefferson Memorials, with stops along Ohio Drive SW.

Most local and long-distance charter tours also focus on the National Mall. Tour buses are allowed to drop off visitors to the project area at the east entrance of the Lincoln Memorial Circle as well as at the World War II Memorial drop off to the southeast corner of the project area.

Tour buses are not allowed to queue for extended periods of time, so they must wait to pick up visitors in designated parking areas, the closest of which are at the south side of the 1700 block of Virginia Avenue NW and the north side of the 1500 block of Independence Avenue SW (DDOT 2009).



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## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This “Environmental Consequences” chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this EA. This chapter also includes definitions of impact thresholds (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative impacts. As required by the Council on Environmental Quality (CEQ) regulations implementing the NEPA, a summary of the environmental consequences for each alternative is provided in Table 2.3 which can be found in “Chapter 2: Alternatives.” The resource topics presented in this chapter, and the organization of the topics, correspond to the resource discussions contained in “Chapter 3: Affected Environment.”

### **General Methodology for Establishing Impact Thresholds and Measuring Effects by Resource**

The following elements were used in the general approach for establishing impact thresholds and measuring the effects of the alternatives on each resource category:

- general analysis methods as described in guiding regulations, including the context and duration of environmental effects;
- basic assumptions used to formulate the specific methods used in this analysis;
- thresholds used to define the level of impact resulting from each alternative;
- methods used to evaluate the cumulative impacts of each alternative in combination with unrelated factors or actions affecting park resources; and
- methods and thresholds used to determine if impairment of specific resources would occur under any alternative

These elements are described in the following sections.

### **General Analysis Methods**

The analysis of impacts follows CEQ guidelines and Director’s Order 12 procedures (NPS 2001) and is based on the underlying goal of supporting forest regeneration and providing for long-term protection, conservation, and restoration of native species and cultural landscapes. This analysis incorporates the best available scientific literature applicable to the region and setting, the species being evaluated, and the actions being considered in the alternatives.

As described in Chapter 1, the NPS created an interdisciplinary science team to provide important input to the impact analysis. For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity thresholds.

### **Impact Thresholds**

Determining impact thresholds is a key component in applying NPS *Management Policies* and Director’s Order 12. These thresholds provide the reader with an idea of the intensity of a given impact on a specific topic. The impact threshold is determined primarily by comparing the effect to a relevant standard based on applicable or relevant/appropriate regulations or guidance, scientific literature and research, or best professional judgment. Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document. Intensity definitions are provided throughout the analysis for negligible, minor, moderate, and major impacts. In all cases, the impact thresholds are defined for adverse impacts. Beneficial impacts are addressed qualitatively.

Potential impacts of all alternatives are described in terms of type (beneficial or adverse); context; duration (short- or long-term); and intensity (negligible, minor, moderate, major). Definitions of these descriptors include:

**BENEFICIAL:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

**ADVERSE:** A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

**CONTEXT:** Context is the affected environment within which an impact would occur, such as local, park-wide, regional, global, affected interests, society as whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact topic. As such, the impact analysis determines the context, not vice versa.

**DURATION:** The duration of the impact is described as short-term or long-term. Duration is variable with each impact topic; therefore, definitions related to each impact topic are provided in the specific impact analysis narrative.

**INTENSITY:** Because definitions of impact intensity (negligible, minor, moderate, and major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed.

## Cumulative Impacts

NEPA regulations require an assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are defined as “the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects are considered for all alternatives, including the no action alternative.

The methodology for determining cumulative effects is derived from using an “ $X+Y=Z$ ” analysis where “ $X$ ” represents the impacts of the alternative and “ $Y$ ” is other past, present, and reasonably foreseeable future actions. When considered relative to each other, their combined contribution to the overall cumulative effect is “ $Z$ ”. It is important to note that due to the disparate scale and location of the proposed actions, effects from certain proposed actions could be moderate, but when considered in the overall context, could constitute a relatively small incremental portion of the project area and contribute to a collective minor effect.

Table 4.1 summarizes the cumulative impacts projects and describes the various resource areas that could be affected by these projects. In addition to those actions identified below, other current and future plans, including the National Mall Plan, are described in Chapter 1. Figure 4.1 delineates the location of the cumulative impacts projects. The analysis of cumulative effects was accomplished using four steps:

1. Fully identify resources affected by any of the alternatives (i.e., the impact topics).
2. Identify an appropriate spatial boundary for each resource.
3. Determine which actions may affect the resources identified.
4. Summarize the cumulative impact, which are the effects of the proposed action plus other actions affecting the resource.

Figure 4.1 – Cumulative Impacts Projects or Actions



Table 4.1 - Cumulative Impacts Projects

Type of action	Cumulative Impact Project	Description	Status
Landscape Maintenance	Not applicable (N/A)	<p>The NPS actively manages and maintains the landscape on the National Mall. In the project areas, this maintenance covers the vegetation along the elm walks and the turf adjacent to the Reflecting Pool.</p> <p><b>Affected Resources Areas:</b> Current landscape maintenance results in impacts, primarily beneficial, to visitor use, public safety, vegetation, cultural resources, and aesthetics. Some adverse impacts may be associated with visitor experience and aesthetics while landscape and maintenance operations are taking place.</p>	PRESENT/ ongoing
Public Events and Visitor Use	N/A	<p>The National Mall attracts visitors from all over the world, approximately 26 million people per year with most visits occurring in spring and summer. In addition, the National Mall also hosts special events each year, including demonstrations, festivals, and holiday celebrations. These special events can draw hundreds of thousands of people to the area.</p> <p><b>Affected Resources Areas:</b> Special events have the potential to add to the impacts related to construction in terms of additional resource damage to vegetation, soils, aesthetics, public safety, and cultural resources as well as Park management and operations. The proposed timing of construction will play a role in the level of impacts.</p>	PRESENT/ ongoing

Table 4.1 - Cumulative Impacts Projects

Type of action	Cumulative Impact Project	Description	Status
Security and Security Improvements	N/A	<p>Since the 1995 Oklahoma City federal building bombing and 9/11, security improvements have been implemented or will likely be implemented in the future throughout the Washington, D.C., area, including the project area, including using Jersey barriers and other devices that limit access to vehicles.</p> <p><b>Affected Resources Areas:</b> The security measures, although important for public safety, have resulted in impacts on the visual and cultural resources of the area. The presence of law enforcement has also been increased, causing impacts on Park management and operations.</p>	PRESENT/ongoing
Construction of other structures on the National Mall	National Museum for African American History and Culture (NMAAHC)	<p>This building will be constructed on a five-acre parcel on the Washington Monument Grounds between 14th and 15th Streets and Constitution Avenue NW and will be between five and eight stories in height.</p> <p><b>Affected Resources Areas:</b> This new museum will affect visitor use and transportation since it will be a highly visible draw for tourists upon completion of construction. It will affect visual and cultural resources since it will be the first new structure to be built on the National Mall in the 21st century.</p>	FUTURE 2012 - 2016
	Vietnam Veterans Memorial Visitor Center (VVMC)	<p>This center will educate students and visitors about the Vietnam War and the memorial itself. The VVMC will be located in the northwestern corner of the National Mall, west of the Vietnam Veterans Memorial, on the east side of 23rd Street between the Lincoln Memorial Circle and Constitution Avenue.</p> <p><b>Affected Resources Areas:</b> This new memorial will affect visitor use since it will be a highly visible draw for tourists upon completion of construction. It will also potentially impact cultural and visual resources and floodplains.</p>	FUTURE 2011 or 2012
	Martin Luther King, Jr., (MLK) Memorial	<p>This project will establish a memorial to Dr. King on a three-acre site within the triangular area bounded by Independence Avenue, relocated West Basin Drive, and the western edge of the Tidal Basin walkway. The memorial will be conceptually a landscape experience, using stone, water, and trees, to convey the main themes of Dr. King's legacy: justice, democracy, and hope.</p> <p><b>Affected Resources Areas:</b> This new memorial will affect visitor use since it will be a highly visible draw for tourists upon completion of construction. Due to its location, this project will have short-term impacts on transportation. It will also potentially impact cultural and visual resources and floodplains.</p>	FUTURE 2010
	Potomac Park Levee Project	<p>This project will introduce an improved levee system in the area between 23rd Street and 17th Street and along the north side of the Reflecting Pool. At 17th Street, just south of Constitution Avenue, a closure structure will be built with abutments that support posts and panels that will be erected during a flood emergency. At 23rd Street and along the Reflecting Pool, existing low spots in the levee will be filled and brought to an elevation that complies with U.S. Army Corp of Engineers (USACE) standards.</p> <p><b>Affected Resources Areas:</b> The new structures and landscape modifications will potentially impact floodplains, Park management and operations, cultural and visual resources. During construction, it will potentially impact transportation, public safety, and visitor use.</p>	FUTURE 2010
	D.C. World War Memorial (or the D.C. War Memorial)	<p>This project will enhance the stormwater drainage system and landscaping and will rehabilitate parts of the memorial itself, including the lighting system, basement, attic, ceiling and floor panels, and marble.</p> <p><b>Affected Resources Areas:</b> These improvements will potentially impact Park management and operations, and cultural and visual resources. During construction, it will potentially impact public safety and visitor use.</p>	FUTURE 2010

Table 4.1 - Cumulative Impacts Projects

Type of action	Cumulative Impact Project	Description	Status
Construction of other structures and projects near the National Mall	The United States Institute of Peace (USIP) Headquarters	This new structure will be constructed at the northwest corner of the intersection of 23rd Street and Constitution Avenue.  <b>Affected Resources Areas:</b> This new building will potentially have an impact on visual resources due to lightscape management in the project area.	PRESENT/ ongoing  2007 - 2010
	The Jefferson Memorial seawall project	This project will rehabilitate the Thomas Jefferson Memorial plaza, seawall, and staircases in a manner that improves pedestrian circulation and visitor safety.  <b>Affected Resources Areas:</b> These improvements will potentially impact Park management and operations, and cultural and visual resources. During construction, it will potentially impact public safety and visitor use.	ongoing  2009 - 2010
	Rehabilitation of Ohio Drive SW between the Ericsson Memorial and the Memorial Bridge	This roadway realignment project will widen the west lane by several feet, while maintaining the width below the Memorial Bridge and Parkway Drive Bridge.  <b>Affected Resources Areas:</b> During construction, these improvements will potentially impact transportation, public safety, and visitor use.	FUTURE  2010
	Constitution Avenue upgrades	Constitution Avenue NW between 23rd Street NW and 16th Street NW will be rehabilitated; streetscape improvements will introduce new street lighting and storm sewer upgrades.  <b>Affected Resources Areas:</b> During construction, these improvements will potentially impact transportation, public safety, and visitor use.	FUTURE  2011

## Impairment of Resources

The NPS *2006 Management Policies* (NPS 2006) requires an analysis of potential effects to determine whether actions would impact or impair Park resources. The fundamental purpose of the national park system, as established by the *Organic Act* and reaffirmed by the *General Authorities Act*, as amended, begins with a mandate to conserve Park resources and values. These laws give the NPS the management discretion to allow impacts on Park resources and values (when necessary and appropriate) to fulfill the purposes of a Park, as long as the impact does not constitute impairment of the affected resources and values. NPS managers must always seek ways to avoid or minimize, to the greatest degree practicable, adversely impacting Park resources and values.

The impairment prohibited by the *Organic Act* and the *General Authorities Act* is an impact, in the professional judgment of the responsible NPS manager, that harms the integrity of Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact on any Park resource or value may constitute impairment, but an impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value the conservation of which is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the Park;
- key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or

- identified as a goal in the Park's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the Park, visitor activities, or activities undertaken by contractors and others operating in the Park. An impairment determination is included in the conclusion statement for all impact topics related to cultural resources, visual resources, water resources, soils, vegetation, and floodplains. Impairment determinations are not made for visitor use and enjoyment, public safety, or Park operations and management, because impairment findings relate to Park resources and values, and these impact areas are not generally considered to be Park resources or values. Impairment determinations are not made for visitor use and experience because, according to the *Organic Act*, enjoyment cannot be impaired in the same way that Park resources and values can be impaired.

In analyzing impairment in conjunction with the NEPA analysis for this project, the NPS takes into account the fact that if impairment were likely to occur, by operation of the CEQ's regulations at 40 CFR, such impacts would be considered to be major or significant. This is because the context and intensity of the impact would be sufficient to render what would normally be a minor or moderate impact to be major or significant. Taking this into consideration, NPS guidance notes that "Not all major or significant impacts under a NEPA analysis are impairments. However, all impairments to NPS resources and values would constitute a major or significant impact under NEPA. If an impact results in impairment, the action should be modified to lessen the impact level. If the impairment cannot be avoided by modifying the proposed action, that action cannot be selected for implementation" (NPS 2003b).

## Visitor Use and Experience

### METHODOLOGY AND ASSUMPTIONS

The purpose of this impact analysis is to assess the effects of the alternatives on the visitor experience goals of the NAMA and visitor experience in the areas that would be affected by the rehabilitation of the Reflecting Pool and surrounding area as well as visitor use of all attractions on the National Mall that are in the project area. To determine impacts, the current uses of the area were considered and the potential effects of the construction and implementation of the rehabilitation on visitor experience and use were analyzed. Activities and the type of visitor experience and use/visitation that occur in the Park and which might be affected by the proposed actions, as well as the visual character of the area and noises experienced by the visitors, were considered.

### STUDY AREA

The study area for visitor use and experience is the project area surrounding the Lincoln Memorial, the Reflecting Pool, and the World War II Memorial as well as portions of West Potomac Park south of Independence Avenue SW.

### IMPACT THRESHOLDS

*Negligible:* Visitors would likely be unaware of any effects associated with implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.

*Minor:* Changes in visitor use and/or experience would be slight and detectable but would not appreciably limit critical characteristics of the visitor experience. Visitor satisfaction would remain stable.

*Moderate:* A few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in a specified activity would be altered. Some visitors who desire their continued use and enjoyment of the activity/visitor experience might pursue their choices in other available local or regional areas. Visitor satisfaction would begin to decline.

*Major:* Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. Visitors who desire their continued use and enjoyment of the activity/visitor experience would be required to pursue their choices in other available local or regional areas. Visitor satisfaction would markedly decline.

*Duration:* Short-term impacts would occur sporadically throughout the course of a year. Long-term impacts would last more than one year.

## Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and the Lincoln Memorial east plaza. Visitation in the project area would continue to expose the visitor amenities to use and wear beyond their anticipated purpose.

### ELM WALKS

Along the length of both elm walks, the benches, trash receptacles, and lighting fixtures would continue to provide visitor comfort and would not change in quality or quantity. The walking surface would remain



unaltered and continue to be uneven and irregular, presenting tripping hazards for visitors. The worn dirt paths, or social trails, would continue to diminish the prominence of the vistas along the elm walks. The benches and trash receptacles would continue to degrade under constant visitor use and there would continue to be no drinking fountains to provide visitor comfort.

The temporary lighting fixtures would continue to provide illumination at night, but the intensity and appearance of the lighting fixtures would continue to detract from the prominence of the adjacent monuments and memorials at night since there is a slight ambient reflection perceived on the water of the Reflecting Pool. In addition, the nighttime reflection of the temporary lighting fixtures in the Reflecting Pool would continue to detract from the Reflecting Pool's overall reflective qualities. The style of light fixture and the ambient reflection on the surface of the Reflecting Pool have a noticeable but slight adverse impact on visitor experience; the lights and reflection visually detract from the prominence of the project area, but not to a degree that appreciably diminishes visitor experience. Consequently, the no action alternative would have long-term minor adverse impacts on visitor experience along the elm walks.

#### **LINCOLN MEMORIAL EAST PLAZA**

There would continue to be no ADA/ABAAS accessibility path between the lower approachway terrace and the Lincoln Memorial east plaza, diminishing the experience of those requiring such a path. The lower approachway stairs and landings would depreciate visitor enjoyment and would continue to pose a hazard to public safety because of the cracked and spalled concrete and uneven and irregular surface of the stairs and landings. For this reason, the no action alternative would have a long-term, moderate adverse impact on visitor use of the Lincoln Memorial east plaza.

The temporary concrete barriers in the center section would remain and would continue to provide a secure vehicular barrier. Currently, some visitors lean against or sit on them, which provides a beneficial impact to visitor use. However, their presence is inconsistent with the historic landscape and diminishes the vista between the Lincoln Memorial and Washington Monument, causing long-term minor adverse impacts to visitor experience at the Lincoln Memorial east plaza.

#### **REFLECTING POOL**

The current conditions, operations, and maintenance of various aspects of the Reflecting Pool would remain the same. Currently, the visual quality of the Reflecting Pool is poor; the water appears green and murky, which detracts from the overall visual quality of the project area, but not in a manner that appreciably diminishes visitor experience since it still retains its reflective quality.

The Reflecting Pool is empty during cleaning and inspection, which occurs once or twice annually for a duration of 10 to 14 days. The Reflecting Pool is a critical characteristic of the project area and when it is empty, visitor experience would be markedly changed since the grand vista between the Lincoln Memorial, World War II Memorial, and Washington Monument would be compromised. The lack of water in the Reflecting Pool would result in a short-term moderate adverse effect in visitor experience.

The social paths, while not paved, would continue to provide direct access between the World War II Memorial and the Lincoln Memorial. However, the irregular surface of the granite coping and these worn dirt paths would continue to detract from the visual quality of the project area, compromising the grand vista and posing a tripping hazard for visitors' safety. The result would be long-term minor adverse impacts to visitor use and experience.

#### **CUMULATIVE IMPACTS**

Many past, present, and future activities in the project area could affect visitor use and experience including ongoing landscape and facility maintenance, security improvements, public events, visitor services, and several present and future projects that would directly affect the Mall. Ongoing grounds and building maintenance activities would likely result in beneficial long-term cumulative impacts on visitor

use and experience since they would maintain and enhance the areas used by visitors. However, they would also cause short-term minor adverse impacts from noise and disturbance in the limited areas where maintenance would restrict visitor access.

Present and future construction in the study area, including the Potomac Park Levee, the D.C. War Memorial rehabilitation, VVMC, USIP, MLK, and the Thomas Jefferson Memorial seawall project would contribute cumulatively to visitor experience by adding new visual elements and new visitor destinations, mostly long-term, beneficial impacts. However, some of these construction projects could potentially adversely impact visitor use and experiences. Construction of the Potomac Levee project would have short-term minor adverse impacts on the visual, acoustic, and vegetative character of the project area and would introduce the presence of construction vehicles to the project area. MLK Memorial construction would have long-term, negligible, adverse impacts to visitor experience during the proposed 18- to 24-month construction period. In combination with the MLK Memorial construction, the Thomas Jefferson Memorial seawall project construction would close both the northwest and southeast portions of the Tidal Basin; the construction at the Tidal Basin will be directly in front of the Memorial. Detours will be provided and access to the Memorial via the stairs and the chamber will be maintained. These disruptions will cause long-term minor adverse impacts to visitor activities in the basin during the 18- to 24-month construction duration.

Upon completion, the VVMC, the USIP, NMAAHC, and the MLK Memorial would introduce new visitors to the project area. Under the no action alternative, the project area would not be adequately capable of accommodating visitor comfort or ensuring their safety due to the uneven, non-accessible walking surfaces in the project area, the worn site furnishings, and insufficient nighttime lighting, resulting in long-term minor adverse impacts to visitor use.

The impacts from other actions and plans on the visitor use and experience in the study area, combined with the long-term minor adverse impacts associated with the no action alternative, would result in long-term beneficial cumulative impacts in the study area.

## **CONCLUSION**

At the elm walks, long-term minor adverse impacts to visitor use would be expected due to aging condition of the site furnishings along the elm walks, insufficient nighttime lighting, and irregular walking surfaces. At the east plaza and lower approachway, there would also be long-term minor to moderate adverse impacts resulting from the lack of accessible paths between the lower approachway terrace and the east plaza. At the Reflecting Pool there would be short- and long-term minor adverse impacts resulting from the worn dirt paths and cleaning and inspection of the Reflecting Pool. Cumulative impacts would be long-term and beneficial; there would be short-term minor adverse cumulative effects resulting from other construction projects in the study area.

## **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

### **ELM WALKS**

Along the length of both elm walks, the benches, trash receptacles, and lighting fixtures would be reconfigured to improve visitor comfort and would be relocated to the outboard side of the walkways. The benches and trash receptacles would be rehabilitated or replaced, and drinking fountains would be installed at planned intervals. New permanent lighting fixtures would replace the existing temporary light fixtures to enhance the level of illumination for nighttime visitation and to introduce a new style of fixture that is consistent with the historic character of the project area. By consolidating the site furnishings to the outboard side of the walkways, the views toward the Reflecting Pool from the elm walks would be

unencumbered. In addition, the walkways would be resurfaced to eliminate tripping hazards and to improve accessibility. These proposed actions represent a long-term beneficial impact to visitor use along the elm walks.

During the installation of the new site furnishings and path resurfacing, there would be short-term minor adverse impacts to visitor use and experience due to the presence of construction equipment, noise, and temporary closure of certain portions of the elm walks.

#### **LINCOLN MEMORIAL EAST PLAZA**

At the east plaza, there are three options for replacing the center section temporary concrete barriers with a unified design solution that integrates ADA/ABAAS accessibility pathways down to the Reflecting Pool. There are several proposed actions with the potential to impact visitor use included in the action alternative that are common to Options A1, A2, and A3.

First, each option allows for the removal of up to 36 existing metal bollards that surround the Lincoln Memorial Circle. Secondly, the lower approachway stairs and landings would be rehabilitated to repair wear and damage and to improve public safety. Next, several irrigation valves would be installed at various points along the east plaza to accommodate site cleaning. These valves would be recessed and would not affect public safety. Finally, during construction when the site is being disturbed, conduit would be installed to the kiosks to accommodate future electrical expansion. These proposed actions all would provide a beneficial long-term impact because they would improve the visual quality of the project area, enhancing visitor experience while simultaneously improving the functionality and operation of certain features and elements in the project area which would enhance visitor use. However, each of the proposed options would result in short-term moderate adverse impacts due to construction activity and resultant noise. Mitigation measures can be used to reduce the impacts of construction activity on visitor use and experience such as screening of construction equipment and public notification of construction periods.

In addition, each of the options varies in their respective overall effect to visitor use and experience.

##### Option A1:

Option A1 would use a combination of bollards and security walls along the new curvilinear walkways to provide a permanent vehicular barrier system and accessible connections between the Reflecting Pool, elm walks, and the east plaza. The security walls would alter the existing visual character of the area, but would introduce new seating opportunities for visitors along well illuminated and accessible walkways, similar to the security walls at the Washington Monument. However, in this option, new bollards would extend across the elm walks and the walkways that flank the Reflecting Pool which would visually obstruct a primary pedestrian route, resulting in a long-term minor adverse impact to the visitor experience. The long-term beneficial impacts of the new seating opportunities along accessible, well illuminated walkways would offset the minor adverse impacts resulting from the presence of new bollards across primary walking routes. In addition, the design of the new curved walkways, undertaken in coordination with DC HPO, NCPC and CFA, would be undertaken in a way to minimize visual impacts and enhance the overall experience for visitors. The net result from the implementation of Option A1 would be a long-term beneficial impact.

##### Option A2:

Option A2 would have similar effects to Option A1 since the curved walkways follow the same general alignment and provide an adequate level of perimeter security and accessibility. However, this option uses bollards rather than security walls along the entire length of the inner side of the curved walkways. This option would introduce more bollards to the project area and some of the new bollards would be placed across the elm walks and walkways that flank the Reflecting Pool,

obstructing the primary pedestrian route. As a result of the net addition of bollards to the project area, the long-term beneficial impacts resulting from new accessible paths would be downgraded, producing a long-term minor adverse impact to visitor use and experience.

Option A3:

Option A3 would have similar effects to Option A1 since the curved walkways follow the same general alignment and provide an adequate level of perimeter security and accessibility. However, Option A3 would use a higher ratio of security walls to bollards than Option A1. These security walls would provide a seating opportunity to visitors and would incorporate lighting. At less than 5 percent, the slope of these paths is shallower than Option A1, so no handrails would be required. Although bollards cross the elm walks in this option, there would be no bollards that cross the walkways flanking the Reflecting Pool. There would be long-term beneficial impacts resulting from the curved accessible walkways that incorporate mainly seating walls, rather than bollards, that would be well illuminated. There would be no bollards obstructing the new primary walkways flanking the Reflecting Pool. In addition, the overall design, undertaken in coordination with DC HPO, NCPC and CFA, ensures that the new walkways would enhance the overall experience for visitors. The net result from the implementation of Option A3 would be a long-term beneficial impact.

#### **REFLECTING POOL PEDESTRIAN CIRCULATION SYSTEM**

The worn dirt paths that flank the Reflecting Pool would be formalized into 14 to 16 foot wide sidewalks. There would be short-term minor adverse impacts during construction due to the presence of construction equipment, noise, and the closure of the area immediately surrounding the Reflecting Pool. However, the elm walks would remain open to accommodate travel between the monuments. Following construction, there would be long-term beneficial impacts resulting from the replacement of the current uneven surface and improvement of the safety and visitor experience for the millions of visitors who travel between the World War II Memorial and the Lincoln Memorial.

#### **REFLECTING POOL STRUCTURAL SYSTEM**

Various actions are proposed to improve the functionality of certain aspects of the Reflecting Pool, such as the structural system, water supply, volume, and drainage. In each option, the granite coping and visible cracks and spalled concrete in the foundation of the Reflecting Pool would be repaired, visually improving the appearance of certain components of the Reflecting Pool. Nevertheless, there would be varying degrees of adverse impacts due to construction, depending on which option is implemented.

Option B1:

This option would include a partial reconstruction of the foundation slab, grade beam, joint system, and granite coping that would require approximately nine months to complete, during which time the Reflecting Pool would be empty and visitor access would be limited within the project area. If construction would be completed in a timeframe to avoid special events that occur on the National Mall, the impacts would be short-term and minor. However, if the duration of construction could not be completed without avoiding special events due to weather or other optimal construction conditions, short-term moderate adverse impacts would be expected. If construction could not avoid occurring during a special event, any resulting impacts would be mitigated through media outreach and NPS advisories to the general public to notify visitors of the closure areas and the duration of closure.

*Options B2 and B3:*

These options would include a full reconstruction of the foundation slab, grade beam, joint system, and granite coping that would require approximately 21 months to complete, during which time the Reflecting Pool would be empty and visitor access would be limited within this area. Since the Reflecting Pool is a historic feature within this cultural landscape and the duration of its closure would span several substantial special events in the project area, there would be a long-term moderate adverse impact. However, this impact could be mitigated through media outreach and NPS advisories to the general public to notify visitors of the closure areas and the duration of closure.

**REFLECTING POOL WATER SYSTEM**

There are three options to improve the water system at the Reflecting Pool. Options C1, C2, and C3, once implemented, would have the same negligible effects on visitor use at the Reflecting Pool since none of them will affect the aesthetics of the water or the circulation around the Reflecting Pool. Each of the options would have short-term moderate adverse impacts due to the maintenance, repair, and cleaning of the Reflecting Pool which varies by option but would not exceed the current practice cleaning and inspection once to twice annually for a duration of 10 to 14 days, during which time the Reflecting Pool is empty.

In addition, each option varies in the type and size of equipment and structures required to support the infrastructure, resulting in varying degrees of effects across options C1, C2, and C3.

*Option C1:*

In this option, to support a new point of intake at the Potomac River in West Potomac Park, a new pump station and subsurface electrical vault would be constructed. The existing method of discharge to the Tidal Basin would be maintained. The pump station would be approximately 15 feet by 15 feet and would be located in West Potomac Park, west of Ohio Drive SW. It would be designed to be consistent in style and material with other structures in the surrounding cultural landscape. The presence of a new structure would result in short-term minor adverse impacts to the adjacent area during construction and long-term adverse effects, but would be designed in a manner that would not yield effects above a threshold of minor. The installation of the subsurface pipes would have short-term minor adverse impacts to visitor use due to partial road closures, disruption, noise, and limited access to certain areas of the project area. However, closures would not affect the most popular portions of the project areas. There would be no effect to the recreational fields to the east of Ohio Drive SW.

*Option C2:*

In Option C2, the existing method of water supply from the municipal source would be maintained. To support a new point of discharge, a new 16-inch subsurface pipe and subsurface electrical vault would be installed north of the Reflecting Pool. This new pipe would be installed beneath Constitution Gardens. The installation of the subsurface pipe and electrical vault would have short-term minor adverse impacts to visitor use due to resulting construction activity noise and limited access to certain parts of the project area. However, closures would not affect the most popular portions of the project area.

At the Reflecting Pool, ultrasonic transducers would be installed and would be used to treat the water and enhance the water quality. These transducers would be placed below the water's surface and would not be visible. They would be fed by electrical power sources located in four subsurface concrete vaults, each measuring 10 feet by 12 feet, installed to the south of the southern elm walk. These vaults would be located well outside prominent viewsheds and would not be of a size or scale to disrupt visitor use on the recreational fields, resulting in negligible long-term adverse impacts

impact on visitor use or experience in the project area. The electrical power sources would require electrical conduit to be installed beneath the elm walks to connect to the ultrasonic transducers. The installation of the conduit would have a short-term negligible adverse effect since it would require the closure of portions of the south elm walk; the north elm walk would remain open.

Option C3:

In this option, to support a new point of intake at the Tidal Basin in West Potomac Park, a new pump station and subsurface electrical vault would be constructed. A new subsurface pipe to support the point of discharge in West Potomac Park, south of Ohio Drive would be installed. The pump station would be approximately 15 feet by 15 feet and would be located in West Potomac Park between the Tidal Basin and West Basin Drive and Independence Avenue SW. The exact location would be determined in the design phase, but it would be consistent in style and material with other structures in the surrounding cultural landscape. The construction of this structure would result in short-term moderate adverse effects as it would disrupt visitor experience adjacent to the popular area around the Tidal Basin. The presence of a new structure would introduce long-term adverse effects, but would be designed in a manner that would not yield effects above a threshold of minor.

The installation of the subsurface pipes would have short-term minor adverse impacts to visitor use due to partial road closures, disruption, noise, and limited access to certain parts of the project area. However, closures would not affect the most popular portions of the project area.

The implementation of any option would result in short-term minor adverse impacts resulting from the presence of construction equipment, noise, and the closure of portions of the recreational fields to the south of the Reflecting Pool. However, due to the ubiquity of recreational fields within and adjacent to the project area, particularly within West Potomac Park, impacts would be slight and detectable but would not appreciably diminish visitor use and would therefore not exceed a minor adverse effect.

#### **CUMULATIVE IMPACTS**

Impacts from other actions and projects in the cumulative area of analysis would be the same as described for the no action alternative, ranging from long-term beneficial resulting from increased visitor opportunities, to short-term minor and negligible adverse impacts resulting from ongoing construction and closures of certain areas. The effects of these actions, added to the long-term benefits resulting from overall site improvement and the short-term (potentially long-term depending on the options chosen) minor to possibly moderate adverse effects related to construction, would result in long-term overall beneficial impacts on visitor use and experience in the study area and surroundings.

#### **CONCLUSION**

The action alternative would have different impacts to the various locations within the project area.

There would be long-term beneficial impacts along the elm walks resulting from the new reconfiguration and restoration of site furnishings and improved walkway surface. There would, however, be short-term minor adverse impacts during construction.

The Lincoln Memorial east plaza Options A1 and A3 would have long-term beneficial impacts as a result of new accessible pathways that create additional seating opportunities and that provide adequate perimeter security to the area. Option A2 would introduce additional bollards to the project area, resulting in long-term minor adverse impacts to visitor experience. All three options would result in short-term moderate adverse impacts to visitor use during the construction of the new accessibility walkways.

At the Reflecting Pool, during construction, Option B1 would result in short-term moderate adverse impacts and Options B2 and B3 would result in long-term moderate adverse impacts to visitor use. Implementation of any option, once completed, would visually improve the appearance of certain

components of the Reflecting Pool since the joints in the granite coping and visible cracks and spalled concrete in the foundation of the Reflecting Pool would be repaired.

The Reflecting Pool water system Options C1 and C3 would have long-term minor adverse impacts on visitor use after construction has been completed, primarily due to the presence of the new pump stations in West Potomac Park. There would be short-term moderate adverse impacts during the cleaning and inspection. These options would have short-term minor adverse impacts as a result of the installation of the subsurface pipes connecting the new water systems. Option C2 would have long-term negligible adverse impacts resulting from the ultrasonic transducers and subsurface concrete vaults which would not have a detectable impact to visitors. Option C2 would have short-term minor adverse impacts as a result of the installation of a subsurface pipe, the ultrasonic transducers, and the subsurface concrete vaults.

Implementation of any option of the action alternative (A1–A3, B1–B3, and C1–C3) would have minor adverse impacts during construction due to the presence of equipment, noise, and the disruption of portions of the project area, including recreational fields to the south of the Reflecting Pool. Depending on the duration of construction, these impacts would be long- to short-term.

Cumulative impacts would range from long-term beneficial resulting from increased visitor opportunities to short-term minor and negligible adverse impacts resulting from ongoing construction and closures of certain areas. The effects of these actions, added to the long-term benefits resulting from overall site improvement would result in long-term overall beneficial impacts on visitor use and experience in the study area and surroundings.

## Public Safety

### METHODOLOGY AND ASSUMPTIONS

The analysis of health and safety considers risks to Park employees and the general public that are associated with hazards in the project area as well as the proposed construction, maintenance, and implementation of improvements to the Reflecting Pool and surrounding area. Impacts for this resource area were analyzed qualitatively, using information provided by the project engineers and Park service staff familiar with the current operation and maintenance within the project area.

### STUDY AREA

The study area for health and safety issues includes the project area, which includes the Reflecting Pool and surrounding area.

### IMPACT THRESHOLDS

The impact intensities for the assessment of impacts on health and safety follow. Where impacts on health and safety become moderate, it is assumed that current visitor satisfaction and safety levels would begin to decline, and some of the Park's long-term visitor goals would not be achieved.

*Negligible:* The impact on health and safety would not be measurable or perceptible.

*Minor:* The impact on health and safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors or employees at localized areas.

*Moderate:* The impact on health and safety would be sufficient to cause a change in accident rates at existing low-accident locations or in areas that currently do not exhibit noticeable accident trends.

*Major:* The impact on health and safety would be substantial. Accident rates in areas usually limited to low accident potential are expected to substantially increase in the short- and long-term.

*Duration:* Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

## Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and the Lincoln Memorial east plaza.

### ELM WALKS

Along the length of both elm walks, the site furnishings would continue providing visitor comfort and would not change in quality or volume. The continuation of use of these site furnishings would have no effect on public safety since there are no incidents associated with the site furnishings in the project area.

The main hazard to public safety along the elm walks is the accessibility and safety deficiencies in the primary routes to the Lincoln Memorial. These deficiencies include slopes in excess of 5 percent, unpaved circulation routes, uneven asphalt paths, broken concrete pavement, and uneven concrete and stone pavement. These deficiencies in the walking surfaces have the potential to affect all visitors to the project area. The exact number of visitors to this site who have mobility handicaps is unknown, but the percentage is assumed to be similar to the general population, if not higher due to the proximity to the World War II Memorial.



Under the no action alternative, the condition of the walkway surfaces would continue to generate measurable or perceptible impacts to public safety by presenting tripping hazards to both employees and visitors, and it would continue to degrade if not actively corrected. However, these hazards would be localized and limited to a relatively small number of visitors so the impacts would be long-term minor adverse. In addition, the lack of accessible paths at the western terminus of the elm walks would continue to be non-compliant with NPS' legal and ethical responsibility for safe and universally accessible sites for all visitors.

#### **LINCOLN MEMORIAL EAST PLAZA**

The lower approachway landing and stairs, which are currently compromised in several areas due to deteriorating and broken concrete, would continue to generate measurable or perceptible impacts to public safety by presenting tripping hazards to both employees and visitors and would continue to degrade if not actively corrected. However, these hazards would be localized and limited to a relatively small number of visitors so the impacts would be long-term minor adverse. The temporary concrete barriers in the center section of the east plaza would continue to provide a secure vehicular barrier to the Lincoln Memorial and would have no effect on public safety.

#### **REFLECTING POOL**

Under the no action alternative, the worn dirt paths would continue to be non-compliant with the NPS' legal and ethical responsibility for safe and universally accessible sites for all visitors. However, it is important to note that these paths are not a formal component of the pedestrian circulation system in the project area. In addition, the uneven nature of the granite coping and joints would continue to present hazards for visitors walking along the edge of the Reflecting Pool. These deficiencies generate measurable, but localized, long-term minor adverse impacts to public safety.

The no action alternative for the water source of the Reflecting Pool would have negligible effect since the current water leakage and method to fill, clean, or discharge the Reflecting Pool does not have a measurable or perceptible effect on public safety.

There would also be long-term minor adverse effects to public health if visitors were to come in contact with the water in the Reflecting Pool, particularly during the warmer months. Inputs of organic matter, including waterfowl feces, coupled with elevated water temperatures during the warmer months and little water flow, encourages bacterial reproduction and algal growth that affects water quality at times. Although the water entering the Reflecting Pool has already been treated with chloramine, a disinfectant commonly used to treat drinking water and which resists degradation, and the water is periodically treated with an algacide, there are still residual water quality problems resulting from the accumulation of organic matter, shallow depth, and lack of flow in the Reflecting Pool. The presence of bacteria or other pathogens in the Reflecting Pool could pose a potential risk to public health from waterborne illnesses, as a result of accidental ingestion or from physical contact, should visitors fall into the Reflecting Pool or illegally wade in it. It is important to note that visitors are not allowed to wade in or immerse themselves in the Reflecting Pool, and due to the visual appearance of the water, it does not seem readily appealing to drink.

#### **CUMULATIVE IMPACTS**

Actions that affect public safety in the study area include any public use that has the potential for accidents. More crowded use of the National Mall during special events can lead to increased visitor injuries, a long-term minor adverse impact; the various construction projects underway or planned for the area all have the potential for injuries and safety issues. However, all these projects would be done under an approved health and safety plan, limiting adverse impacts to negligible or minor levels. The additional security that has been and would be constructed or provided within the study area provides a substantial long-term beneficial effect. The impacts of these other actions, in conjunction with the long-term minor to moderate adverse impacts expected from the no action alternative, would result in long-term minor adverse impacts related to health and

safety within the study area, with most of the cumulative adverse effect stemming from the existing condition of the irregular walking surfaces throughout the project area and lack of ADA/ABAAS-compliant access.

## **CONCLUSION**

Under the no action alternative, there would be long-term minor to moderate impacts on public safety due to the possibilities of accidents or injuries occurring throughout the project area as a result of uneven walking surfaces or non-ADA/ABAAS-compliant walkways. Cumulative impacts would be long-term and minor, with most of the adverse effect stemming from the existing condition of the irregular walking surfaces throughout the project area and non-ADA/ABAAS-compliant walkways.

## **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area. The Reflecting Pool, lower approachway, the elm walks, and surrounding area would be improved and returned to a good condition that would be maintained through routine and cyclic maintenance. At each location for all options, there would be short-term minor adverse effects to public safety resulting from construction since the presence of equipment and trenches to install subsurface elements would affect a popular tourist destination with a proportionately large number of visitors. The effects would be mitigated by timing construction for off-peak tourism seasons and by implementing effective signage and markers that guide visitors away from the area of impact. Visitors would not be allowed within the construction zones.

### **ELM WALKS**

A permanent lighting system, new walking surface, and reconfigured site furnishings would facilitate the comfort and enhance the safety of the large number of visitors who walk at all times of the day between the Lincoln Memorial and the World War II Memorial. The installation of irrigation valves would have no effect on public safety since they would be located outside the parameters of the walking paths. In addition, they would be recessed so as not to present a tripping hazard. In sum, these proposed actions would have a long-term beneficial impact on public safety in the project area.

There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the project area. To minimize adverse effects, construction barriers would be placed around the construction zones so visitors would not have access to potentially dangerous activities. Construction workers would follow the approved health and safety plan.

### **LINCOLN MEMORIAL EAST PLAZA**

Options A1, A2, and A3 would all have a long-term beneficial effect since each would provide safe and accessible paths to the Lincoln Memorial Reflecting Pool, ensuring compliance with the NPS policy for universal accessibility; each option provides for a secure vehicular barrier system that would enhance the protection of the Lincoln Memorial. The differences between the options, primarily the ratio of bollards to security walls, result in the same effects to public safety since there are no appreciable differences in safety between bollards and security walls.

There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the project area. During the time of construction, irrigation valves would be installed at the east plaza, and subsurface conduit would be installed at the kiosks. Since the ground would already be disturbed in these areas, there would be no additional impacts resulting from these actions beyond the short-term minor to negligible adverse effects resulting from construction. To minimize adverse effects, construction barriers would be placed around the construction zones so visitors would not have access to potentially dangerous activities. Construction workers would follow the approved health and safety plan.

### **REFLECTING POOL CIRCULATION**

The surfacing of the worn dirt paths that flank the Reflecting Pool would eliminate tripping hazards and would provide an accessible surface for visitors walking between the two memorials, resulting in a long-term beneficial impact to public safety. There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the Reflecting Pool. To minimize adverse effects, construction barriers would be placed around the construction zones so visitors would not have access to potentially dangerous activities. Construction workers would follow the approved health and safety plan.

### **REFLECTING POOL STRUCTURAL REPAIRS**

Options B1, B2, and B3 would result in the same long-term beneficial impacts to public safety because they all result in adequate repair and rehabilitation of the structural system and granite coping around the Reflecting Pool. There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the Reflecting Pool. To minimize adverse effects, construction barriers would be placed around the construction zones so visitors would not have access to potentially dangerous activities. Construction workers would follow the approved health and safety plan.

### **REFLECTING POOL WATER SOURCE**

Options C1, C2, and C3 vary in their approach to modifying the supply, filtration, treatment, and discharge of the water system at the Reflecting Pool. However, in terms of public safety, all options have the same beneficial long-term effect because the resultant water quality in each proposed option would be enhanced from the current condition; the water would be maintained at a suitable level for human exposure and would be treated and filtered to eliminate health risks associated with waterborne diseases. Visitors would still not be allowed to wade in or immerse themselves in the Reflecting Pool.

The NPDES permitting process would ensure that the water quality in the Reflecting Pool, as well the water quality in adjacent water bodies (into which the Reflecting Pool discharges), complies with the Clean Water Act.

There would be short-term minor to negligible adverse effects during construction due to the presence of equipment and disruption of the Reflecting Pool. To minimize adverse effects, construction barriers would be placed around the construction zones so visitors would not have access to potentially dangerous activities. Construction workers would follow the approved health and safety plan.

### **CUMULATIVE IMPACTS**

Cumulative impacts from the action alternative would be the same as described for the no action alternative, ranging from long-term beneficial, related to increased security and walking surfaces, to minor adverse impacts from visitor injuries and possible construction-related incidents. The effects of these actions, added to the long-term benefits resulting from overall improvements to the project area and the short-term minor to possibly moderate adverse effects related to construction, would result in overall long-term beneficial impacts on public safety in the study area and surroundings.

### **CONCLUSION**

Implementation of the action alternative would have short-term negligible impacts on public safety during the construction phase but long-term beneficial impacts upon completion, mainly due to the improvement of the safety and accessibility of walking surfaces in the project area, such as the elm walks, lower approachway stairs and landings, and the Reflecting Pool walkways. The structural and water system options for the Reflecting Pool would result in negligible long-term effects on public safety because the proposed actions would not affect employees or visitors to a greater degree than current conditions. Cumulative impacts on public safety would be long-term and beneficial in the study area and surroundings.

## **Park Management and Operations**

### **METHODOLOGY AND ASSUMPTIONS**

Park management and operations, for the purpose of this analysis, refers to the quality and effectiveness of the Park staff to maintain and administer Park resources and facilities and to provide for an effective visitor experience. This includes an analysis of the condition and maintenance of the facilities and concessioners used to support the operations of the Park. Facilities included in this project include the Park itself and the sites within the study area. Park staff who are knowledgeable of these issues were members of the planning team that evaluated the impacts of each alternative. The impact analysis is based on the current description of Park operations presented in “Chapter 3: Affected Environment” of this document.

### **STUDY AREA**

The study area for operations and maintenance includes the Reflecting Pool and surrounding area as well as portions of West Potomac Park. Park management and operations encompasses staffing, facilities, and budget.

### **IMPACT THRESHOLDS**

Impact thresholds are as follows.

*Negligible:* Park operations would not be impacted or the impact would not have a noticeable or appreciable impact on Park operations.

*Minor:* Impacts would be noticeable, but would be of a magnitude that would not result in an appreciable or measurable change to Park operations.

*Moderate:* Impacts would be readily apparent and would result in a substantial change in Park operations that would be noticeable to staff and the public. Mitigation could be required and may be effective.

*Major:* Impacts would be readily apparent and would result in a substantial change in Park operations that would be noticeable to staff and the public and would require the Park to readdress its ability to sustain current Park operations.

*Duration:* Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

## **Impacts of the No Action Alternative**

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and Lincoln Memorial east plaza.

### **ELM WALKS**

Along the length of both elm walks, the benches would continue to be maintained under the existing Park maintenance schedule but would not be improved in quality so the site furnishings would continue to suffer from overuse. The trash receptacles would remain in the same locations and would continue to be emptied twice daily. The lighting fixtures would continue to provide basic illumination along the path at night. Finally, the asphalt walking surface would remain unchanged and would be maintained according to the current Park budget and schedule. There would be long-term minor adverse impacts to Park

operations as a result of not undertaking a comprehensive upgrade to the site furnishings and walkways since the costs to maintain these resources would increase annually over time.

#### **LINCOLN MEMORIAL EAST PLAZA**

At the Lincoln Memorial east plaza, the deteriorating lower approachway stairs and landings would continue to be patched and repaired according to the existing maintenance schedule; there would be long-term minor adverse impacts to Park operations as a result of not undertaking a comprehensive upgrade to this area since the costs to ameliorate these deficiencies would increase annually over time.

At the center section of the east plaza, the temporary concrete barriers would continue to provide a secure vehicular barrier to the Lincoln Memorial, but the concrete would require periodic and minimal maintenance in accordance with the existing Park schedule.

Currently, there are no water outlets along the elm walks or on the east plaza, so the cleanup following special events would require long hoses to be brought in from outside the project area, also requiring a larger effort for maintenance staff, an impact which would be noticeable in the short-term but minor, since these activities would not appreciably adversely affect Park management and operations.

#### **REFLECTING POOL CIRCULATION**

To the north and south of the Reflecting Pool, the worn dirt paths would continue to have noticeable but slight effect on Park operations and maintenance since the paths are currently maintained in coordination with the turf in the project area and separate Park resources are not devoted to their upkeep (i.e. there is no snow removal plan for these paths). Maintenance of these worn dirt paths would continue to create a long-term minor adverse impact to Park management and operations.

#### **REFLECTING POOL STRUCTURAL SYSTEM AND WATER SOURCE**

The Reflecting Pool structural system (which includes the foundation slab, grade beam, and granite coping) was comprehensively evaluated in 1986. The findings of the study indicated that the joints and structural components have deteriorated over time and are in the process of failure. This study also revealed that the water leakage is undercutting the Reflecting Pool foundation. In addition to further destabilizing the structural system, this leakage represents a substantial operating expense for the NPS since the volume of the Reflecting Pool needs to be continuously recharged and the source is drawn from the municipal system.

Under the no action alternative, the current conditions, operations, and maintenance of various aspects of the Reflecting Pool would be continued. Currently, the Park inspects and cleans the Reflecting Pool once to twice annually, and patches and repairs deficiencies in place. This process occurs more frequently because of the compromised quality of the structural system. The reactive method of repair and the ongoing water leakage are tremendously inefficient and represent a substantial proportion of staff resources and operating budget (both present maintenance costs and long-term life cycle costs) within the Park.

As a result, the no action alternative presents a long-term moderate adverse effect because of the proportionally higher allocation of Park staff and operating budget currently dedicated to maintaining the quality of the Reflecting Pool. The costs to continuously maintain this historic resource would also increase annually over time.

The resources in portions of West Potomac Park south of Independence Avenue SW would be maintained in accordance with the existing Park schedule.

#### **CUMULATIVE IMPACTS**

Other actions and plans that could affect Park management and operations include the time, staffing, and funding needed for construction and management of buildings on the National Mall and within the study

area. In addition, there is an increased demand on these resources due to the myriad of special events that occur within the project area. Cumulatively, these have a long-term minor adverse effect on Park management and operations. Under the no action alternative, no additional duties would be added to NPS staff's managerial and operational responsibilities; therefore, when combined with these potential cumulative actions, cumulative impacts related to the status quo would be long-term minor and adverse. As the Reflecting Pool and elm walks continue to enjoy intense visitor use, increased staff efforts may be needed to adequately maintain these resources resulting in long-term minor adverse impacts.

## **CONCLUSION**

The no action alternative represents the continuation of maintenance efforts and operations for the project area. Due to the millions of annual visitors to the site, the pedestrian circulation systems (walking surfaces, stairways, landings, etc.) and site furnishings suffer from constant wear and use and require a continued high level of maintenance. The no action alternative also represents the continued operation of the existing structural and water systems at the Reflecting Pool, which consists of persistent water leakage, structural deficiencies, and other functional inefficiencies. As a result, the no action alternative would result in long-term moderate adverse impacts for Park operations and management to maintain an adequate level of project area resources. Overall, cumulative impacts would be long-term, adverse, and minor.

## **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

### **ELM WALKS**

The proposed actions (the refurbishment and/or replacement and relocation of the benches, lighting fixtures and trash receptacles and the resurfacing of the walkways) would have a net long-term beneficial impact on Park management and operations since, over time, the cost and level of effort to maintain the site furnishings and walkways would diminish as they would not require the intensity of annual maintenance that currently exists. The installation of new irrigation valves would further contribute to the long-term beneficial impacts since the resources required to supply water to the project area for site cleaning or landscape watering would be reduced. The new drinking fountains would result in a minimal expense and occasional repairs, as necessary, over their useful life. The costs and maintenance represent a negligible long-term adverse effect. Overall, the proposed actions along the elm walks represent a long-term beneficial impact to Park management and operations.

### **LINCOLN MEMORIAL EAST PLAZA**

At the east plaza several proposed actions are included in the action alternative that are common in Options A1, A2, and A3. First, each option allows for the removal of up to 36 existing metal bollards that surround the Lincoln Memorial Circle. Secondly, the lower approachway stairs and landings would be rehabilitated to repair wear and damage and to improve public safety. Next, several irrigation valves would be installed at various points along the east plaza to accommodate site cleaning. Finally, during construction when the site would be disturbed, conduit would be installed to the kiosks to accommodate future electrical expansion.

Several features are common to Options A1, A2, and A3 and result in the following impacts:

- The comprehensive repair of the lower approachway stairs and landings would result in a long-term beneficial impact since it would effectively eliminate the need for periodic maintenance and repair of deficiencies.

- The installation of improved utility service to the kiosks would result in long-term beneficial impact to the Park since future electrical service expansion would be accommodated with relatively little expense.
- The installation of irrigation valves would contribute to the long-term beneficial impact since the resources required to bring water into the project area for site cleaning or landscape watering would be reduced.

Options A1, A2, and A3 would replace the temporary concrete barriers with a unified design solution that integrates accessible pathways down to the Reflecting Pool. Each option would introduce new elements and features into the project area which would result in a higher operating expense and maintenance cost over what presently exists. Each option is differentiated below in terms of impacts to Park management and operations.

*Option A1*—This option introduces a combination of security walls and bollards along curved walkways. In this option, due to the slope of the curved walkways, handrails are required along security walls, representing a minor operations and maintenance cost. In addition, the opportunity to introduce recessed lighting to the security walls would provide an increased cost.

*Option A2*—This option introduces a series of bollards along curved walkways with no security walls.

*Option A3*—This option introduces a combination of security walls and bollards along curved walkways. In this option, due to the slope of the curved walkways, no handrails are required along security walls. In addition, the opportunity to introduce recessed lighting to the security walls would provide an increased cost. In this option, the configuration of bollards adjacent to the Reflecting Pool eases daily operation and maintenance because they would not inhibit the maneuverability of trucks and service access vehicles to access the area.

Option A1, A2, and A3 do not vary substantially in degree or extent of effect on Park management and operations relative to each other since the relative cost of maintaining bollards versus security walls is comparable. Bollards generally require more maintenance over the long-term timeframe than security walls do, however, the life cycle cost difference is negligible since the security walls have a substantially higher up-front cost. These options all represent a long-term moderate adverse impact to Park management and operations in this particular location of the project area because the new curved walkways would require substantial additional maintenance by Park resources (staffing and funding) over and above what presently exists.

#### **REFLECTING POOL CIRCULATION**

Converting the worn dirt paths into paved walkways will introduce an additional and noticeable demand on Park maintenance since the pavement will need to be maintained. However, since Park staff would need to maintain the lower approachway and elm walks at the same time, the extra level of effort to attend to the Reflecting Pool walkways would not be of a magnitude that would substantially effect Park management and operations. Therefore, the formalization of the worn dirt paths would have a long-term minor adverse impact on Park management and operations.

#### **REFLECTING POOL STRUCTURAL SYSTEM**

*Option B1*—This option would involve a partial reconstruction of the foundation slab, grade beam, joint system, and granite coping. This option would require Park staff to perform major repair and rehabilitation every two years, an improvement over the current conditions, but not a comprehensive or long-term structural solution. The effect would be long-term minor adverse since it would create a noticeable but non-substantial demand on Park management and operations.

*Options B2.1 and B2.2*—These options would involve a full reconstruction of the foundation slab, grade beam, joint system, and granite coping and the installation of a framed system supported on piles. Option B2.1 provides the best long-term maintenance value for the construction cost while Option B2.2 provides good long-term maintenance; however, the initial construction cost is higher than that of Option B2.1. Each option would result in long-term beneficial impacts to Park management and operations because the structural integrity of this historic resource would be fully restored, eliminating the need for continuous patching and repairs to abate water leakage. Each option results in minor settlement in the system over the long-term (100 years) life of the Reflecting Pool.

*Option B3*—This option would involve a full reconstruction of the structural system and the installation of a new unified system that ties together the foundation slab, grade beam, and joint system. The unified system, which does not require piles, would represent an initial cost savings, but presents only minimal savings relative to the other options. This option would result in long-term beneficial impacts to Park management and operations because the structural integrity of this historic resource would be fully restored, eliminating the need for continuous patching and repairs to abate water leakage. Each option results in minor settlement in the system over the long-term life of the Reflecting Pool.

Of the options to repair the structural system of the Reflecting Pool, only Option B1 represents an adverse impact; Options B2 and B3 both present strategies to comprehensively repair the structural system of the Reflecting Pool, resulting in long-term beneficial impacts on Park management and operations.

#### **REFLECTING POOL WATER SYSTEM**

There are three options to improve the water system at the Reflecting Pool. Each option varies in the method of water source, treatment, filtration, and discharge as well as in the type and size of equipment and structures required to support the infrastructure. Furthermore, these result in varying degrees of effects to Park management and operations across options C1, C2, and C3.

*Option C1*—This option presents a sustainable strategy to fill and recharge the Reflecting Pool. The Potomac River would be used to fill the Reflecting Pool instead of the municipal water system. This option would require new equipment (pump station, subsurface vault, and screening and filtration devices) that would require daily maintenance from Park staff and associated costs to maintain the equipment over time. Despite the daily costs and increased staffing requirement to maintain the equipment, this option represents a long-term beneficial impact on Park management and operations since it introduces a sustainable strategy to fill, recirculate, and treat the water in the Reflecting Pool, eliminating reliance on the municipal water supply and extensive use of chemicals to enhance the water quality.

*Option C2*—This option would use the municipal water system for supply and discharge of the Reflecting Pool. Since this option would not recirculate the water, additional equipment would be required to enhance the water quality. The filtration equipment and corresponding electrical power sources would require ongoing maintenance by Park staff beyond the initial installation. As this option would require more equipment than the other options, this option would also require proportionally more maintenance. Option C2 represents a long-term moderate impact on Park management and operations since it introduces a new system with ongoing maintenance requirements.

*Option C3*—Option C3 is similar to Option C1, with the exception that water would be drawn from the Tidal Basin and discharged to the Potomac River. The impact to Park management and operations would be the same as Option C1 because the operating costs and maintenance requirements of the system and equipment would be the same.



Options C1, C2, and C3 would all result in initial short-term minor adverse impacts as the Park staff become familiar with the new equipment and required maintenance protocols. Over the long-term, all options would represent a beneficial impact to Park management and operations because, although they would require higher daily operating costs and staffing requirements than what currently exists, they would improve the water system and quality over time, representing a long-term efficiency to the Park.

#### **CUMULATIVE IMPACTS**

Other actions and plans that could affect Park management and operations include the time, staffing, and funding needed for construction and management of buildings on the National Mall and within the study area. In addition, there is an increased demand on these resources due to the number of special events (i.e. Memorial Day events and Fourth of July celebration) that occur within the project area. Cumulatively, these have a long-term minor adverse effect on Park management and operations. Under the action alternative, although additional operation and maintenance requirements would affect Park budget and staffing, the long-term net impact of all options is beneficial since the proposed actions would improve efficiency in Park management and operations over the long-term life of the pedestrian circulation system in the project area and the Reflecting Pool structural system and water system. Therefore, when added to the long-term minor adverse cumulative effects of other projects in the foreseeable future, the net result is a long-term beneficial impact on Park management and operations.

#### **CONCLUSION**

Although implementation of certain options would result in additional operation and maintenance requirements that would affect Park budget and staffing, the long-term net impact of the action alternative is beneficial since the proposed actions would improve efficiency in Park management and operations over the long-term life of components in the project area by comprehensively improving the operational efficiency of pedestrian circulation systems, site furnishings, site irrigation, and structural and water systems at the Reflecting Pool. Over the long-term, these improvements would create a net reduction in Park maintenance cost and staffing.

Options A1, A2, and A3 do not vary substantially in degree or extent of effect on Park management and operations relative to each other since the relative cost of maintaining bollards versus security walls is comparable. Bollards generally require more maintenance over the long-term timeframe than security walls do, however, the life cycle cost difference is negligible since the security walls have a substantially higher up-front cost. These options all represent a long-term moderate adverse impact to Park management and operations in this particular location of the project area because the new curved walkways would require additional maintenance by Park resources (staffing and funding) over and above what presently exists.

Of the options to repair the structural system of the Reflecting Pool, only Option B1 represents an adverse impact; Options B2 and B3 both present strategies to comprehensively repair the structural system of the Reflecting Pool, resulting in long-term beneficial impacts on Park management and operations.

Options C1, C2, and C3 all represent long-term beneficial impacts to Park management and operations because, although they would require higher daily operating costs and staffing requirements than what currently exists, they would improve the water system and quality over time, representing a long-term efficiency to the Park.

Therefore, when added to the long-term minor adverse cumulative effects of other projects in the foreseeable future, the net result is a long-term beneficial impact on Park management and operations.

## Cultural Resources

### GUIDING REGULATIONS AND POLICIES

Federal actions that have the potential to affect cultural resources are subject to a variety of laws and regulations. The NHPA of 1966, as amended, is the principal legislative authority for managing cultural resources associated with NPS projects. Generally, Section 106 of the NHPA requires all federal agencies to consider the effects of their actions on cultural resources listed and/or determined eligible for listing in the NRHP. Such resources are termed “historic properties.” In addition, the NHPA requires that federal agencies take action to minimize harm to historic properties that would be adversely affected by a federal undertaking. Agencies must consult with the SHPO; the Tribal Historic Preservation Office (THPO), if applicable; the ACHP, as required; and other interested parties in an effort to avoid, minimize, or mitigate adverse effects. Agreement on mitigation of adverse effects on historic properties is reached through consultation with relevant agencies, including the SHPO, the THPO, and ACHP, where appropriate. Because there are no federally recognized Indian tribes present in the District of Columbia or with a connection to the site of the Reflecting Pool Rehabilitation project, the Section 106 process does not, in this instance, involve a THPO.

In addition, the NPS is charged with the protection and management of cultural resources in its custody. This is furthered through the implementation of *Director’s Order #28: Cultural Resources Management Guidelines* (NPS 1998), *NPS Management Policies* (NPS 2001a), and the 2008 Service-wide PA with the Advisory Council and the National Conference of State Historic Preservation Officers. These documents charge NPS managers with avoiding, or minimizing to the greatest degree practicable, adverse impacts on Park resources and values. Although the NPS has the discretion to allow certain impacts in Parks, that discretion is limited by the statutory requirement that Park resources and values remain unimpaired, unless a specific law directly provides otherwise.

### GENERAL METHODOLOGY AND ASSUMPTIONS

The NPS categorizes cultural resources by the following categories: archeological resources, cultural landscapes, historic districts and structures, museum objects, and ethnographic resources. Only impacts on cultural landscapes and historic districts and structures are of potential concern for this project. As noted in Chapters 1 and 3, there would be no impacts to archeology (the Reflecting Pool is entirely located in made land or “fill”), museum collections, or ethnographic resources.

The analyses of effects on cultural resources that are presented in this section respond to the requirements of both NEPA and Section 106 of the NHPA. In accordance with the Advisory Council’s regulations implementing Section 106 (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were identified and evaluated by (1) determining the APE; (2) identifying cultural resources present in the APE that are either listed in or eligible to be listed in the NRHP (i.e., historic properties); (3) applying the criteria of adverse effect to affected historic properties; and (4) considering ways to avoid, minimize, or mitigate adverse effects. The assessment of effects to cultural resources is also taking place in a series of meetings with the DC HPO, other interested federal agencies, and Consulting Parties invited by the NPS.

Under the implementing regulations for Section 106, a determination of either *adverse effect* or *no adverse effect* must also be made for affected historic properties. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the NRHP (e.g., diminishing the integrity of the resource’s location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the proposal that would occur later, be farther removed in distance, or be cumulative (36 CFR 800.5). A determination of *no adverse effect* means there is either no effect or that the effect would not diminish, in any way, the characteristics of the cultural resource that qualify it for inclusion in the NRHP.

CEQ regulations and DO-12 of the NPS also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact: for example, reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. Cultural resources are nonrenewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

The NPS guidance for evaluating impacts, DO-12, (NPS 2001) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For cultural resources, it is rarely possible to measure impacts in quantifiable terms; therefore, impact thresholds must rely heavily on the professional judgment of resource experts.

A summary is included in the impact analysis sections for cultural landscapes and historic districts and structures. The impact analysis is an assessment of the effect of the undertaking (implementation of the alternatives) on NRHP-eligible or listed cultural resources only, based upon the Advisory Council's criteria of adverse effect.

#### **AREA OF POTENTIAL EFFECTS**

As indicated in Chapter 3, the APE for this undertaking encompasses NPS reservations 332 (West Potomac Park) and 2 (Washington Monument Grounds) in northwest and southwest Washington, D.C. This area is generally bounded by the Potomac River on the west, Constitution Avenue on the north, 14th Street and Raoul Wallenberg Place on the east, and the Potomac River Railroad Bridge on the south. In addition to these two reservations, the affected environment also includes the axis between the Capitol and the Lincoln Memorial, which is a significant feature of the 1902 McMillan (or Senate Park Commission) Plan for Washington and is recognized in National Register documentation for the Plan of the City of Washington. The APE was established by the NPS after consultation with the DC HPO and Consulting Parties invited under the Section 106 process. Within this APE, there are many cultural resources (see maps delineating Individually Listed Historic Properties, Historic Districts, and Cultural Landscapes, and Table 3.1 in Chapter 3). The impact analysis proceeds according to the broad cultural resource categories: historic districts and structures and cultural landscapes.

Historic districts and structures is the resource category under which most resources impacted by the undertaking were first documented. The recognition of cultural landscapes as a useful organizing concept for documenting certain historic properties is now widespread. Nonetheless, evaluating cultural landscapes is a relatively recent activity that the NPS has embraced with the inventorying of many cultural landscapes, particularly in Washington. Because of these recent studies, there is repetition of some properties as both individually listed resources or districts and significant cultural landscapes. For example, the Washington Monument and Grounds and Lincoln Memorial and Grounds are both individual historic properties and cultural landscapes. Each of these is addressed in following sections, "Historic Districts and Structures" and "Cultural Landscapes."

#### **CUMULATIVE IMPACTS**

The following are the projects within and near the APE that must be considered for cumulative effects on cultural resources: the VVMC, the USIP, the DC War Memorial (DCWM) improvements, the NMAAHC, the MLK Memorial, Lincoln Memorial security improvements, Thomas Jefferson Memorial seawall improvements, and Potomac Park Levee improvements. The general context for the consideration of cumulative impacts on cultural resources is the widespread concern that the National Mall may become overcrowded with structures and other built features, as evidenced by the creation of plans and commissions to limit the addition of new projects on the Mall. Because the National Mall is already such

a concentration of significant historic properties as well as the planned location of several new memorials and museums, a precise assessment of the contribution of any one new project such as the Reflecting Pool rehabilitation to cumulative effects is somewhat theoretical.

## Cultural Resources Impact Analysis for Historic Districts and Structures

### AREA OF POTENTIAL EFFECTS

Of the many historic properties of this type, the project has the potential to directly or indirectly impact only five historic properties within the APE that are individually listed in the National Register: the Lincoln Memorial, the Washington Monument, the Vietnam Veterans Memorial, the Korean War Veterans Memorial, and the Plan of the City of Washington (L'Enfant-McMillan Plan). The undertaking also has the potential to directly or indirectly impact contributing resources in the East and West Potomac Parks Historic District. In addition to these properties, the project has the potential to affect the World War II Memorial, which, as a major though recent memorial on the National Mall, automatically qualifies for the NRHP. Analysis of other historic properties within the APE suggests that they would not be affected due to their distance from the project site.

### IMPACT THRESHOLDS

For a historic district or structure to be listed on the NRHP, it must possess significance (the meaning or value ascribed to the historic district or structure), and the features necessary to convey its significance must have integrity. For purposes of analyzing potential impacts on historic districts and structures, the thresholds of change for the intensity of an impact are defined as follows:

*Negligible:* The impact is at the lowest level of detection with neither adverse nor beneficial consequences. For purposes of Section 106, the determination of effect would be *no adverse effect*.

*Minor:* Adverse impact—Alteration of a pattern(s) or feature(s) of a historic district or structure listed on or eligible for the NRHP would not diminish the integrity of a character-defining feature(s) or the overall integrity of the historic property. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact—The character-defining features of the historic district or structure would be stabilized/preserved in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995), to maintain its existing integrity. For purposes of Section 106, the determination of effect would be *no adverse effect*.

*Moderate:* Adverse impact—The impact would alter a character-defining feature(s) of a historic district or structure and diminish the integrity of that feature(s) of the historic property. For purposes of Section 106, the determination of effect would be *adverse effect* but one which could be fairly easily avoided, minimized, or mitigated through an Agreement Document

Beneficial impact—The historic district or structure would be rehabilitated in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* to make possible a compatible use of the property while preserving its character-defining features. For purposes of Section 106, the determination of effect would be *no adverse effect*.

*Major:* Adverse impact—The impact would alter a character-defining feature(s) of the historic district or structure and severely diminish the integrity of that feature(s) and the

overall integrity of the historic property. For purposes of Section 106, the determination of effect would be *adverse effect* and would present serious difficulty to avoid, minimize, or mitigate through an Agreement Document.

**Beneficial impact**—The historic district or structure would be restored in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* to accurately depict its form, features, and character as it appeared during its period of significance. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Duration**—Short-term impacts, obviously negative, are equivalent to the period of construction, which may range from 9 to 21 months.

### **Historic Districts and Structures Impacts of the No Action Alternative**

The no action alternative would continue with the present Reflecting Pool structural system, water source, pedestrian circulation, and security features. Corrective measures intended to be temporary (security on the east side of the Lincoln Memorial and elm walk lighting) would also continue in their present form. Current problems with the structural system, due to inadequate underpinning of the Reflecting Pool slab, and the regular cleaning of the Reflecting Pool would therefore also continue, although adverse impacts would be minimized by regular maintenance. The worn dirt paths along the sides of the Reflecting Pool, which have decreased the vegetated border of the Reflecting Pool, would remain, and these paths could be expected to increase in size and/or deteriorate further without intervention in the form of sodding or seeding. The grassy border is a character-defining feature of the Reflecting Pool, which is a contributing element of the East and West Potomac Parks Historic District. The scale of the dirt paths, commensurate with the Reflecting Pool itself, increases the intensity of the adverse impacts of the no action alternative. The temporary concrete security barriers impact the primary Mall axis running from the Capitol through the Washington Monument to the Lincoln Memorial. This axis is a contributing feature of the Plan of the City of Washington. The temporary security features and the dirt paths would also adversely impact the designed vista between the Lincoln Memorial and the Washington Monument, which incorporated the Reflecting Pool and was framed by the double rows of elm trees on either side, as well as views of the memorial as visitors walk toward it from the World War II Memorial. These views are especially impacted as visitors reach the western end of the Reflecting Pool and ascend to Lincoln Memorial Circle. In summary, the no action alternative would have long-term, moderate adverse impacts on historic resources.

### **CUMULATIVE IMPACTS**

Other present and future projects within or adjacent to the study area for the Reflecting Pool Rehabilitation would have the potential to impact historic districts and structures. These projects include the NMAAHC, the Lincoln Memorial Circle Rehabilitation and Security Project, the VVMC, the MLK Memorial, the USIP, the Levee Improvements, the DCWM Improvements, and the Jefferson Seawall Improvements.

The USIP is constructing its new headquarters at the northwest corner of Constitution Avenue and 23rd Street NW continuing a line of prominent buildings along the north side of Constitution Avenue and replacing a parking lot, it will be an appropriate framing building for the West Potomac Park historic district and buildings of the study area. The Lincoln Memorial Circle Rehabilitation and Security Improvements have placed a series of temporary barriers around the circle on the east side of the memorial, a secure access gate on the west side, and two visitor services areas to the north and south. The long-term adverse impacts associated with this project are largely negligible as the design and materials are compatible with the Lincoln Memorial; however, the barriers at the east plaza are an intrusion on the vista of the east-west axis and a moderate long-term adverse impact. The VVMC, to be located to the east

of 23rd Street NW in West Potomac Park, may be anticipated to have a minor long-term adverse impact on the West Potomac Park Historic District, primarily because it will not be in keeping with the design intent of the Park. Construction of NMAAHC, situated on the northeast panel of the Monument Grounds, may result in a future moderate long-term adverse impact on the monument and its grounds. This adverse impact should be mitigated down to a minor level by the ongoing design development and review process for the NMAAHC. Construction of the MLK Memorial would have a moderate long-term adverse impact on the West Potomac Park Historic District, primarily due to alteration of site features, the removal of cherry trees, modifications to the pedestrian circulation system, and the addition of a visitors' contact center. The levee improvements project was assessed as having a moderate long-term adverse impact, primarily to the Washington Monument and Grounds but has been mitigated to a minor level in later design development. Impacts of the Jefferson Memorial Seawall as well as the DCWM improvements would be moderate, long-term beneficial to these and other historic properties. The moderate long-term adverse impacts to historic districts and buildings that would result from the no action alternative, in combination with the beneficial to minor adverse impacts that would result from construction of the above projects, would result in negligible to minor long-term adverse cumulative impacts.

## **CONCLUSION**

The no action alternative would have direct, long-term, moderate, adverse impacts on contributing features of the East and West Potomac Parks Historic District (primarily the Lincoln Memorial and Reflecting Pool), the Plan of the City of Washington, and the World War II Memorial. Cumulative impacts would range from long-term negligible to minor adverse. The no action alternative would not, however, result in impairment of historic districts and structures.

## **Historic Districts and Structures Impacts of the Action Alternative**

### **ELM WALKS**

Under the action alternative, lighting fixtures, benches, and trash receptacles along the elm walks would be refurbished and/or replaced. Drinking fountains would be installed at the west end, east end, and center of both elm walks. The subsurface water supply lines serving the water fountains would also provide water for irrigation valves installed along the elm walks. All site furniture would be located on the outboard side of the walks away from the Reflecting Pool to maintain unobstructed views of the pool and its green setting and to limit infiltration of artificial light into the Reflecting Pool area. Through the Section 106 process, the NPS is consulting with the DCHPO, NCPC, other consulting parties, and federal review agencies such as the CFA on certain design issues connected with the style, scale, function, spacing, and historic appropriateness of street furnishings to be selected and installed by the proposed action. The street furnishings include new replacement light standards, trash receptacles, and benches. Also under investigation is the replacement of the asphalt walkways, installed in 1971, by the original material, believed to be concrete.

As originally built, the elm walks did not have artificial lighting. The temporary lighting added in recent years detracts from night views of the Reflecting Pool and the Lincoln Memorial. Locating new lighting designed to fit into the landscape away from the Reflecting Pool would reduce night-time glare on the pool. Relocating the elm walk lighting and other site furnishings away from the Reflecting Pool would also help minimize their impact on views of the Lincoln Memorial, the Reflecting Pool, and the World War II Memorial and reinforce the important east-west axis of the Reflecting Pool/elm walks landscape. The new lighting elements and relocation and replacement of the site furnishings would not damage the elm trees or affect the walks themselves. On the south side of the Reflecting Pool, however, this reinforced axis could interfere with an understanding of the spatial relationship between the axial Reflecting Pool and the open, informal character of the remainder of West Potomac Park, including the DCWM. The Park's spatial organization is a character-defining feature of the East and West Potomac Parks Historic District. Since the Potomac Park Levee has already altered the spatial organization on the

north side of the Reflecting Pool, the relocation of the site furnishings has no impact on the relationship between the Reflecting Pool and Constitution Gardens. The exact reconfiguration of the site furnishings and type of new lighting fixtures is not known at this time, but will be reviewed and approved by NCPC and CFA through the design review and approvals process. Therefore, it is assumed that the proposed actions would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Therefore, impacts would be direct, long-term, adverse, and minor on the south side of the Reflecting Pool.

The Potomac Park Levee also prevents the action alternative work from adversely impacting historic resources north of the elm walks, such as the Vietnam Veterans Memorial and Constitution Gardens and their associated features. Resurfacing the walks would not require excavation, so the root systems of the elm trees would not be impacted. In summary, the work planned for the elm walks would have direct, long-term, negligible to minor adverse impacts on contributing features of the Lincoln Memorial, East and West Potomac Parks Historic District, and the Plan of the City of Washington.

### **LINCOLN MEMORIAL EAST PLAZA**

Under the action alternative, work on the east plaza would involve 1) the replacement of the current, noncontributing asphalt walkways between Lincoln Memorial Circle and the Reflecting Pool area with walks that comply with ADA/ABAAS guidelines; 2) rehabilitation of the contributing steps from Lincoln Memorial Circle to the Reflecting Pool level, as well as the noncontributing approachway between the steps and the Reflecting Pool;<sup>1</sup> 3) incorporation of security features into the pedestrian circulation system to replace the current temporary concrete barriers on the plaza; 4) the installation of a subsurface conduit to accommodate the utility needs of the two kiosks at the Lincoln Memorial; and 5) installation of two irrigation valves at the lower approachway to facilitate site watering.

The width of the new accessible walks would be approximately 15 to 16 feet. The replacement material to be selected is still under study from the standpoint of historical appropriateness, visual impact, and practical and environmental utility. The regrading required to establish accessible walks would also result in a realignment of the centerline of that segment of the Potomac Park Levee along the new northern walkway. Installation of the accessible walks would require that five trees be removed and replaced: two trees in the south elm walk and three trees in the north elm walk. One additional tree in the south elm walk would be removed, but not replaced. Another tree on the south side of the east plaza would also be removed, but not replaced, while five new trees would be added on each side of the plaza to fill in the concentric rings of elms along Lincoln Memorial Circle. There are three options for implementing the requirements for accessible walks in combination with security features, which are described and analyzed below.

### **OPTION A1**

This option consists of a permanent vehicular barrier system integrated with the curvilinear, ADA/ABAAS-accessible paths from Lincoln Memorial Circle to the Reflecting Pool. The new walks would reconfigure and formalize the current, noncontributing, noncompliant asphalt walks. The new walks—one on each side of the existing terraced steps—would begin at the western terminus of the elm walks, follow a semicircular path to the Reflecting Pool level, cross the elm walks, and join the lower approachway where it meets the Reflecting Pool coping. The north-south walk on the western edge of the lower approachway would be rebuilt with new steps to meet the elm walks. Option A1 uses 42-inch-high bollards along the inner edge of the western half of the new walkway and 36-inch-high security walls

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<sup>1</sup> “West Potomac Park, The Lincoln Memorial Grounds, Cultural Landscape Report” (Joseph and Wheelock, 1999), call the noncontributing approachway a “plaza.”

around the outer edge of the remainder. The wall along the north walk would tie into the Potomac Park Levee.

The grade of the grass panels on either side of the Reflecting Pool would be lowered from east to west near the new walks to form trenches so the walks and their associated retaining walls would provide a security barrier in the manner of a ha-ha. The ha-ha walls would be 36 inches high from their base, below the current ground level. The floor of the Reflecting Pool would also be lowered at its western end so the Reflecting Pool and its granite coping become part of the secure perimeter. In locations where existing or new walks result in gaps in the secure perimeter, bollards would be used to complete the security system. In Option A1, these bollards would be aligned in a north-south direction across the elm walks and the new walks flanking the Reflecting Pool. The current temporary concrete barriers and 36 of the bollards along Lincoln Memorial Circle (18 on either side of the plaza) would be removed if Option A1 were implemented.

As designed under the guidance of the CFA, the Lincoln Memorial and its landscape employed a few spare, geometrical forms (circles and rectangles) and simple materials (marble, granite, grass, trees). The memorial's columns and the elm trees paralleling the Reflecting Pool were the only vertical elements in the composition. The addition of walks, bollards, post-and-chain fencing, and trash receptacles has already adversely impacted the characteristic simplicity of the western end of the Reflecting Pool. The addition of walks, walls, and bollards and the recontouring of the grass panels in this area as proposed in Option A1 formalizes and improves these features but continues that adverse impact. Rehabilitation of the steps rising to Lincoln Memorial Circle would have a beneficial impact on the Reflecting Pool landscape. Taken together, the changes to the pedestrian circulation network in Option A1 would have direct, long-term, minor adverse impacts on the design, materials, setting, and views of the Lincoln Memorial, the Reflecting Pool, and the elm walks.

Option A1 would result in minor impacts on views from the Lincoln Memorial to the east, including the Reflecting Pool, the elm walks, the World War II Memorial, and the Washington Monument and its grounds. Removal of the temporary concrete barriers and some of the bollards at Lincoln Memorial Circle would restore views from the memorial and its terraced steps to a semblance of their condition before temporary security was installed. The walks and security features at the west end of the Reflecting Pool would be invisible from the memorial and its terraces in Option A1 because their location would be below the level of Lincoln Memorial Circle. As visitors reach the eastern edge of the circle, however, the walls and bollards would become visible, impacting views of the Reflecting Pool and elm walks. The new walks alongside the Reflecting Pool would also adversely impact eastern views throughout the viewshed. These views have already been adversely impacted by the dirt paths.

The adverse impacts of Option A1 on the Vietnam Veterans Memorial and the Korean War Veterans Memorial would be negligible. These resources are at a higher elevation than, and some distance from, the new work, generally preventing impacts on reciprocal views and spatial organization. There would be a direct, long-term, minor adverse impact to views from the southwest portion of Constitution Gardens (a contributing feature of the East and West Potomac Parks Historic District) toward the memorial due to the visibility of the security features and new walks in this area.

The new walks and security features would also have direct, long-term, minor adverse impacts on the Plan of the City of Washington. West Potomac Park (NPS Reservation No. 332) and the Lincoln Memorial-Reflecting Pool composition were prominent features of the 1902 McMillan, or Senate Park, Plan for Washington's public parkland, and their significance rests on their function as grand gestures in the transformation of the Mall from a collection of smaller, unintegrated and underdeveloped Parks into a monumental composition that expressed American civic ideals as well as the urban planning principles of the City Beautiful movement. The small scale and confined location of the bulk of the new work would not impact the integrity of these or other aspects of the McMillan Plan as it was implemented.



**OPTION A2**

This option is similar to Option A1 with two exceptions: 1) the vehicle barrier associated with the new ADA/ABAAS-accessible walks consists entirely of 42-inch-high bollards along the inner side of the walks, and 2) the ha-ha features are located on either side of the noncontributing lower approachway rather than flanking the west end of the Reflecting Pool.

As in Option A1, Option A2 would result in direct, long-term, minor adverse impacts on the design, materials, setting, and views of the Lincoln Memorial, the Reflecting Pool, and elm walks, which are contributing features of the East and West Potomac Parks Historic District, due to its impact on the characteristic simplicity of the western end of the Reflecting Pool. With regard to contributing views, the use of the ha-ha feature in the grass panels flanking the lower approachway, the course of the new ADA/ABAAS-accessible paths along the elm walks, and removal of the temporary concrete barriers would help minimize impacts of the new security on views of the Lincoln Memorial from locations such as the observation level of the Washington Monument, the monument grounds, and the World War II Memorial, as well as along much of the length of the elm walks and the Reflecting Pool. The accessible walks and system of bollards and walls would, however, impact views of the Lincoln Memorial, the Reflecting Pool, and the relationship between the two as visitors near the western end of the Reflecting Pool. As visitors approach the memorial, the ha-ha features would be more visible in Option A2 than in Option A1 because the ground rises between the end of the Reflecting Pool and the level of the steps.

Option A2's impact on other historic resources in the APE would be the same as that of Option A1 and for the same reasons. Option A2 would result in minor impacts on views from the Lincoln Memorial to the east, including the Reflecting Pool, the elm walks, the World War II Memorial, and the Washington Monument and grounds. The walks and security features at the west end of the Reflecting Pool would be invisible from the memorial and its terraces in Option A2 because their location would be below the level of Lincoln Memorial Circle. As visitors reach the eastern edge of the circle, however, the walls and bollards would become visible, impacting views of the Reflecting Pool and elm walks.

Also due to the location of the new walks and security features in Option A2, its impact on surrounding historic resources (Vietnam Veterans Memorial and the Korean War Veterans Memorial) would be negligible. There would be a direct, long-term, minor adverse impact to views from the southwest portion of Constitution Gardens (a contributing feature of the East and West Potomac Parks Historic District) toward the memorial due to the visibility of the security features from this area. As in Option A1, the impact of Option A2's new walks and security features on the Plan of the City of Washington would be minor. The small scale and confined location of the bulk of the new work would not impact the integrity of these or other aspects of the McMillan Plan as it was implemented.

**OPTION A3**

Security features in this option consist primarily of 36-inch-high security walls along the curving walkways, with 42-inch bollards used to transition from the plaza. The exact proportion of wall to bollards will be worked out in consultation with review agencies as the design progresses. On the south walk, the security features would follow the inside edge of the walk. On the north, walls would follow both sides of the walk from the Reflecting Pool level to a point approximately halfway up the walk, where the outer wall would tie into the Potomac Park Levee. For the remainder of the walk, the security features would follow the inner side of the walk only. In Option A3, the ha-ha features flank the lower approachway, as in Option A2. The difference between Option A3 is that the bollards at the western edge of the Reflecting Pool coping would cross the new walks there in an east-west line, rather than the north-south alignment of the previous options.

As in the previous options, Option A3 would result in direct, long-term, minor adverse impacts on the design, materials, setting, and views of the Lincoln Memorial, the Reflecting Pool, and elm walks due to

its impact on the characteristic simplicity of the western end of the Reflecting Pool. With regard to views, the use of the ha-ha features in the grass panels flanking the lower approachway, the course of the new ADA/ABAAS-accessible paths along the elm walks, and removal of the temporary concrete barriers would help minimize impacts of the new security on views of the Lincoln Memorial from locations such as the observation level of the Washington Monument, the monument grounds, and the World War II Memorial, as well as along much of the length of the elm walks and the Reflecting Pool. The accessible walks and system of bollards and walls would, however, impact views of the Lincoln Memorial, the Reflecting Pool, and the relationship between the two as visitors near the western end of the Reflecting Pool. As visitors approach the memorial, the ha-ha features would be more visible in Option A3 than in Option A1 because the ground rises between the end of the Reflecting Pool and the level of the steps. The east-west alignment of bollards on the lower approachway would slightly decrease the impact of the security features on visitors' views as they approach the west end of the Reflecting Pool, although they would be more visible from the elm walks.

Option A3's impact on other historic resources in the APE would be the same as that of Option A1 and for the same reasons. Option A3 would result in minor impacts on views from the Lincoln Memorial to the east, including the Reflecting Pool, the elm walks, the World War II Memorial, and the Washington Monument and grounds. The walks and security features at the west end of the Reflecting Pool would be invisible from the memorial and its terraces in Option A3 because their location would be below the level of Lincoln Memorial Circle. As visitors reach the eastern edge of the circle, however, the walls and bollards would become visible, impacting views of the Reflecting Pool and elm walks.

Also due to the location of the new walks and security features in Option A3, its impact on surrounding historic resources (Vietnam Veterans Memorial and the Korean War Veterans Memorial) would be negligible. There would be a direct, long-term, minor adverse impact to views from the southwest portion of Constitution Gardens (a contributing feature of the East and West Potomac Parks Historic District) toward the memorial due to the visibility of the security features from this area. As in the other options, the impact of Option A3's new walks and security features on the Plan of the City of Washington would be minor. The small scale and confined location of the bulk of the new work would not impact the integrity of these or other aspects of the McMillan Plan as it was implemented.

#### **REFLECTING POOL PEDESTRIAN CIRCULATION SYSTEM**

The current dirt paths flanking the Reflecting Pool already constitute a moderate adverse impact that would likely increase in intensity as the paths deteriorate further. Formalizing these walks with hardscape would improve this situation. The pavement would, however, replace a portion of the intended grass border of the pool, resulting in an adverse impact to that character-defining element of the design as originally implemented. The new walks would also adversely impact views from the Washington Monument as well as from the Reflecting Pool area itself. These views, however, are already adversely impacted by the dirt paths that the paved walks would replace. Although the exact design of the walkways, including their materials,<sup>2</sup> color, and paving pattern, is not known at this time, the new walks would be of a scale commensurate with the compositional features of the Lincoln Memorial landscape. The final design would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. The National Park Service anticipates the resolution of this direct, long-term adverse impact to minor intensity through this consultation.

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<sup>2</sup> It is important to note that the use of concrete—the material of the nonhistoric arrangement around the east end of the Reflecting Pool—could give the false impression that the walks were original to the Reflecting Pool's construction.

**REFLECTING POOL STRUCTURAL SYSTEM**

NPS is contemplating three options to address problems with the structural system of the Reflecting Pool. All three seek to stabilize the Reflecting Pool structure and prevent leaks while maintaining the reflective quality of the Reflecting Pool surface. The existing granite coping, a contributing characteristic of the Reflecting Pool would be reused in each option. The three options are discussed below.

**OPTION B1**

Only cracks and deficiencies in the current Reflecting Pool structural system would be addressed in Option B1. The underlying causes of the deterioration of the Reflecting Pool structure would not be addressed. Work would include repair in place of the foundation slab, perimeter grade beam, joints, and granite coping, and the Reflecting Pool would be drained while the work is completed. Studies indicate that approximately 20 percent of the Reflecting Pool structure requires repair. Since the repair work would be undertaken according to the Secretary of the Interior's Standards, Option 1 would result in a direct, long-term minor to moderate beneficial effect on the Reflecting Pool. The intensity of the effect would depend on the extent of the repair undertaken.

**OPTION B2**

In Option B2, the existing slab, grade beam, and piles would be removed and a new foundation slab and piles constructed. NPS is considering two types of piles to support the slab. In Option B2.1, a grid of new grouted piles would be installed beneath the footprint of the Reflecting Pool to a depth of approximately 40 feet, creating compression and compaction of the soil. Crushed aggregate and a concrete slab would be poured over the grid of piles. Option B2.1 could be expected to result in uniform and minimal settlement over the long-term life (100 years) of the Reflecting Pool. In Option B2.2, the supporting system would be composed of a framed slab and beam resting on piles reaching to bedrock. A concrete slab would be poured over the framing system. Option B2.2 could be expected to result in uniform and negligible settlement over the long-term life of the Reflecting Pool.

The Reflecting Pool is a contributing site in the East and West Potomac Parks Historic District National Register documentation. Removal of historic fabric in both of the B2 options would constitute an adverse impact on this feature. The Reflecting Pool's significance, however, rests not on engineering considerations, but on its importance as a design feature of the McMillan Plan for Washington, its place in the landscape design of West Potomac Park, and its association with architects Charles F. McKim and Henry Bacon and landscape architect Frederick Law Olmsted, Jr. Alterations to the pool under the B2 options would be internal to the structure and not readily visible. The Reflecting Pool would be used as it was historically, and the historic character of the property would be retained. The B2 options would have the beneficial impact of addressing underlying structural problems of the Reflecting Pool and repairing its granite coping. Due to the removal of the existing slab, grade beam, and piles, however, Option B2 is judged to constitute a long-term, minor, adverse impact on the Reflecting Pool structure.

**OPTION B3**

In this option, the existing slab and grade beam would be removed, and a new, monolithic concrete structural system would be installed that ties together the foundation slab, grade beam, coping, and adjacent sidewalk. No new piles would be installed. This system could be expected to result in uniform, negligible settlement over time.

As in the case of the B2 options, alterations to the pool under Options B3 would be internal to the structure and not readily visible. The Reflecting Pool would be used as it was historically, and the historic character of the property would be retained. Also like the B2 options, Option B3 would have the beneficial impact of addressing underlying structural problems of the Reflecting Pool and repairing its granite coping. Due to the removal of historic fabric, however, Option B3 is judged to constitute a long-term, minor adverse impact on the Reflecting Pool structure.

## REFLECTING POOL WATER SYSTEM

The action alternative for the rehabilitation of the Reflecting Pool includes three options designed to improve the efficiency of the water system (supply, quality, discharge). They are described below.

### OPTION C1

In Option C1, the Reflecting Pool's water source would be the Potomac River. The river water would circulate in a continuous flow through the Reflecting Pool and would discharge into the north lobe of the Tidal Basin opposite the Kutz Bridge. The intake point would be located in the river wall along Ohio Drive SW, southeast of the John Ericsson National Memorial. The water would be screened at the point of intake to eliminate suspended solids, sediment, and other large debris. The continuous flow would introduce a constant supply of fresh water, and the turnover rate would be designed to inhibit the accumulation of organic waste and algal growth.

The option would require the new construction of a 15 by 15 foot pump station and a subsurface 8 by 16 foot electrical vault to accommodate the pumping and screening of the river water. The pump station and vault would be located near the intake point. Their specific location and design will be further refined in consultation with review agencies as the design process proceeds. The subsurface vault would include an access hatch and an above-ground vent pipe. The pump house would be above ground and would be visible from points from within West Potomac Park and minimally visible from the top of the Washington Monument, but its presence would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight and would therefore produce long-term minor adverse impacts.

Potential adverse impacts from Option C1 would derive from excavation for the construction of the underground pipes and subsurface vaults and visibility of above-ground elements. The impacts on green spaces from trenching and excavation would generally be temporary, and care would be taken to avoid permanent impacts to elm trees. The proposed locations of the pump station and subsurface vault in Option 1 are, generally speaking, in less significant areas of the West Potomac Park. While the exact design of the small structures and subsurface vaults is not known at this time, it seems likely that the adverse impact of the implementation of Option C1 would be direct, long-term, and minor due to the location of the interventions.

### OPTION C2

Option C2 would use water from the District's municipal water system and discharge into the city's sanitary sewer. While use of city water would not require filtration, Option C2 would achieve further improvement of water quality, including the killing of algae, through the introduction of several ultrasonic transducers (approximately the size of a soda can) into the Reflecting Pool.

Potential adverse impacts from Option C2 would derive from excavation for the construction of the underground pipe and the subsurface vaults and the visibility of above-ground elements. The impacts on green spaces from trenching and excavation would generally be temporary, and care would be taken to avoid permanent impacts to trees on the elm walks and in Constitution Gardens. The exact design of the above-ground elements of the subsurface vaults is not known at this time, and their location in the grass panel on the north side of the Reflecting Pool has the potential to add to the adverse impacts of the proposed walk flanking the pool. The design of these features will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. Therefore, it is assumed that they would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Review of these design issues by the DC HPO, NCPC, and CFA would be assumed to mitigate the adverse impact to the level of minor or below.

**OPTION C3**

In Option C3, water for the Reflecting Pool would be drawn from the north lobe of the Tidal Basin, circulate in a continuous flow through the Reflecting Pool, and discharge into the Potomac River. As in Option C1, the water would be screened at the point of intake to eliminate suspended solids, sediment, and other large debris. The continuous flow would introduce a constant supply of fresh water, and the turnover rate would be designed to inhibit the accumulation of organic waste and algal growth. The discharge point would be located in the river wall along Ohio Drive SW, southeast of the John Ericsson National Memorial.

Option C3 requires a pump house and subsurface electrical vault to accommodate the pumping and screening of the river water. The pump house and vaults would be located near the intake point. Its specific location and design will be further refined in consultation with review agencies as the design process proceeds. The vault would include an above-ground vent pipe and access hatch. The pump station would be a 15 by 15 foot above ground structure and would be visible from points from within West Potomac Park around the Tidal Basin and would be visible from the top of the Washington Monument. However, its presence would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight and would therefore produce long-term minor adverse impacts.

As in Option C1, potential adverse impacts from Option C3 would derive from excavation for the construction of the underground pipes and subsurface vaults and visibility of above-ground elements. The impacts on green spaces from trenching and excavation would generally be temporary, and care would be taken to avoid permanent impacts to elm trees. The proposed locations of the subsurface vaults in Option 1 are, generally speaking, in less significant areas of the West Potomac Park. While the exact design of the small structures and subsurface vaults is not known at this time, it seems likely that the adverse impact of the implementation of Option C3 would be direct, long-term, and minor due to the location of the interventions.

**CUMULATIVE IMPACTS**

The other projects within or near the APE for the action alternative are the same as for the no action alternative. As indicated earlier, their impacts on historic districts and structures range from long-term beneficial to minor adverse. The overall assessment below of the impacts upon historic districts and structures of the action alternative is that all components have been shaped through Section 106 consultation to remain at or below the minor adverse level. Therefore, the cumulative impact would be a range of long-term beneficial to minor adverse.

**CONCLUSION**

The impacts on contributing resources within the APE resulting from any combination of the action alternative options can be described in a preliminary manner as direct, long-term, minor, and adverse. The evaluation is judged as preliminary due to the current status of the design, in which several important features—for instance, the location and above-ground features of subsurface vaults, the material and size of the walks flanking the Reflecting Pool have yet to be selected. The exact design of certain elements of the proposed actions is not known at this time, but will be reviewed and approved by NCPC and CFA through the design review and approvals process. Therefore, it is assumed that the proposed actions would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Review of these design issues by the DC HPO, NCPC, and CFA would be assumed to maintain the adverse impact at the level of minor or below.

The work of reorganizing and rehabilitating or replacing site furniture in the elm walks has its chief potential impact on the relationship between the Reflecting Pool and the parkland on either side. Due to

the presence of the Potomac Park Levee on the north, the potential adverse impacts occur only on the south side of the Reflecting Pool and will depend on the number and location of the site elements.

All of the options described in the action alternative regarding installation of accessible walks combined with security features (Options A1, A2, and A3) would have direct, long-term, minor adverse impacts on the design and setting of the Reflecting Pool and views associated with it and the Lincoln Memorial and other contributing features of the East and West Potomac Parks Historic District. The features of the new work are small in scale and confined to a small area (the west end) of a large composition. The same evaluation of impacts of accessible walks is true for the L'Enfant-McMillan Plan resources and for the same reason. Further, since the location of several aspects of this work is below the grade of and some distance from surrounding historic resources, such as the Vietnam Veterans Memorial and the Korean War Veterans Memorial, the impacts of all three A options on those resources are negligible. The exact design of the new walkways flanking the Reflecting Pool, including their materials, color, and paving pattern, is not known at this time. The final design would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. The National Park Service anticipates the resolution of this direct, long-term adverse impact to minor intensity through this consultation.

Option B1 in the action alternative, executed in accordance with the Secretary of Interior Standards, would constitute a beneficial impact on the Reflecting Pool. The intensity of the impact would depend on the extent of the repairs to the Reflecting Pool and its coping. The B2 options and Option B3 have the beneficial impact of addressing underlying structural problems of the Reflecting Pool and maintaining the Reflecting Pool's size, shape, location, reflectivity, and granite coping. Due to the removal of some existing (although generally invisible) historic fabric, however, these options are each judged to constitute a direct, long-term, minor adverse impact on the Reflecting Pool structure.

Potential adverse impacts from all three water system options derive mostly from excavation for the construction of the underground pipes and subsurface vaults and the visibility of above-ground elements. These impacts mainly concern views of nearby contributing features. In Options C1 and C3, the pipes run from the Reflecting Pool to the Potomac River and the Tidal Basin. The subsurface features would be invisible from the Reflecting Pool area, although they would be visible in their immediate vicinity in West Potomac Park. In Option C2, the subsurface construction feature would be located in the grassy border of the Reflecting Pool itself. Adverse impacts of either Option C1 or Option C3 would be long-term, adverse, and minor. The exact design of the aboveground elements of the subsurface vaults is not known at this time, and their location in Option C2 in the grass panel on the north side of the Reflecting Pool has the potential to add to the adverse impacts of the proposed walk flanking the pool. The design of these features will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. Therefore, it is assumed that they would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Review of these design issues by the DC HPO, NCPC, and CFA would be assumed to mitigate the adverse impact to the level of minor or below.

There would be no impairment to historic districts and structures from the action alternative.

## Cultural Landscapes Impact Analysis

### STUDY AREA

The proposed alternatives have the potential to impact character-defining features of four cultural landscapes: Lincoln Memorial Grounds, Washington Monument and Grounds, Constitution Gardens, and the DCWM. The Thomas Jefferson Memorial cultural landscape would not be impacted by the undertaking due to its distance from the site. Impacts on East and West Potomac Parks are described in the previous section, “Historic Districts and Structures.”

### IMPACT THRESHOLDS

In order for a cultural landscape to be listed in the NRHP, it must possess significance (the meaning or value ascribed to the landscape), and the features that convey its significance must have integrity. Character-defining features of a cultural landscape may include spatial organization and land patterns, topography, vegetation, circulation patterns, water features, structures/buildings, and small-scale objects. (See *The Secretary of the Interior’s Standards for the Treatment of Historic Properties and the Guidelines for the Treatment of Cultural Landscapes*, 1996.) For purposes of analyzing potential impacts on cultural landscapes, the thresholds of change for the intensity of an impact are defined in much the same manner as those for historic districts and structures:

*Negligible:* The impact is at the lowest level of detection with neither adverse nor beneficial consequences. For purposes of Section 106, the determination of effect would be *no adverse effect*.

*Minor:* Adverse impact—Alteration of a pattern(s) or feature(s) of the cultural landscape listed on or eligible for the NRHP would not diminish the integrity of a character-defining feature(s) or the overall integrity of the landscape. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact—Preservation of landscape patterns and features would be in accordance with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*, thereby maintaining the integrity of the cultural landscape. For purposes of Section 106, the determination of effect would be *no adverse effect*.

*Moderate:* Adverse impact—The impact would alter a character-defining feature(s) of the cultural landscape and diminish the integrity of that feature(s) of the landscape. For purposes of Section 106, the determination of effect would be *adverse effect* but one which could be fairly easily avoided, minimized, or mitigated through an Agreement Document

Beneficial impact—The landscape or its features would be rehabilitated in accordance with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*, to make possible a compatible use of the landscape while preserving its character defining features. For purposes of Section 106, the determination of effect would be *no adverse effect*.

*Major:* Adverse impact—The impact would alter a character-defining feature(s) of the cultural landscape and severely diminish the integrity of that feature(s) and the overall integrity of the historic property. For purposes of Section 106, the determination of effect would be *adverse effect* and would present serious difficulty to avoid, minimize, or mitigate through an Agreement Document.

**Beneficial impact**—The cultural landscape would be restored in accordance with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* to accurately depict the features and character of a landscape as it appeared during its period of significance. For purposes of Section 106, the determination of effect would be *no adverse effect*.

**Duration**—In the short-term, most impacts would be related to the activity and disruption associated with the 6-to 21-month construction period.

### **Cultural Landscapes Impacts of the No Action Alternative**

As described previously, the no action alternative would continue the present Reflecting Pool structural system, water source, and pedestrian circulation. Corrective measures intended to be temporary (security on the east side of the Lincoln Memorial and elm walk lighting) would also continue in their present form. Current problems with the structural system, due to inadequate underpinning of the Reflecting Pool slab, and the regular cleaning of the Reflecting Pool would therefore also continue, although adverse impacts would be minimized by regular maintenance. The worn dirt paths along the sides of the Reflecting Pool, which have decreased its grassy border (a contributing feature of the Lincoln Memorial Grounds cultural landscape), would also continue, and these paths could be expected to increase in size and/or deteriorate further without intervention in the form of sodding or seeding. The temporary concrete security barriers impact contributing views of the Lincoln Memorial as visitors walk along the Reflecting Pool and the elm walks from the World War II Memorial and, especially, as they ascend to Lincoln Memorial Circle. The barriers also impact contributing views from the memorial and its plaza to the Reflecting Pool and beyond toward the World War II Memorial, the Washington Monument, and the Capitol. As a result of these impacts, the no action alternative would have direct, long-term, moderate adverse impacts on the Lincoln Memorial Grounds cultural landscape. The dirt paths along the Reflecting Pool also have indirect, long-term, moderate adverse impacts on views from the observation deck of the Washington Monument, which are contributing features of the Washington Monument Grounds cultural landscape. They constitute indirect impacts due to the great distance of the monument from the memorial. Because of low elevation of the Reflecting Pool, the dirt paths that parallel it have direct, long-term, negligible impacts on views from Constitution Gardens to the Reflecting Pool, but the temporary concrete barriers constitute a long-term, minor adverse impact on views of the Lincoln Memorial from the southern segment of the loop walk in the gardens.

### **CUMULATIVE EFFECTS**

Other present and future projects within or adjacent to the study area for the Reflecting Pool Rehabilitation would have the potential to directly impact cultural landscapes over the long term. These projects include the NMAAHC, the Lincoln Memorial Circle Rehabilitation and Security Project, the VVMC, the MLK Memorial, the USIP, the Levee Improvements, the DCWM Improvements, and the Jefferson Seawall Improvements.

The USIP headquarters at the northwest corner of Constitution Avenue and 23rd Street NW will continue a line of prominent buildings along the north side of Constitution Avenue and replace a parking lot, but may contribute light pollution to Constitution Gardens and the Lincoln Memorial Grounds. The Lincoln Memorial Circle Rehabilitation and Security Improvements project has placed a series of temporary barriers around the circle on the east side of the memorial, two secure access gates on the east and west sides, and two visitor services areas to the north and south. The long-term adverse impacts associated with this project are largely negligible as the design and materials are compatible with the Lincoln Memorial; however, the barriers at the east plaza are an intrusion on the vista of the east-west axis and a moderate long-term adverse impact. The VVMC, to be located to the east of 23rd Street NW in the Lincoln



Memorial Grounds and adjacent to Constitution Gardens, may be anticipated to have a moderate long-term adverse impact on the Memorial Grounds cultural landscape, primarily because it will not be in keeping with its design intent. Construction of NMAAHC, situated on the northeast panel of the Washington Monument Grounds, may result in a future moderate long-term adverse impact on the Washington Monument and Grounds cultural landscape. This adverse impact should be reduced to a minor level by the ongoing design development and review process for the NMAAHC. The future MLK Memorial will be visible but is remote from any of the study area's cultural landscapes; its construction will have minor adverse indirect long-term impacts on them. The Levee improvements project was assessed as having a moderate long-term adverse impact, primarily to the Washington Monument and Grounds but has been mitigated to a minor level in later design development. The impact of the DCWM improvements would be minor, long-term beneficial to cultural landscape. The moderate long-term adverse impacts to cultural landscapes that would result from the no action alternative, in combination with the beneficial to minor adverse impacts that would result from construction of the above projects, would result in negligible to minor long-term adverse cumulative impacts.

### **CONCLUSION**

The no action alternative would result in direct long-term, moderate adverse impacts on the green setting of the Reflecting Pool, a primary component of the Lincoln Memorial Grounds, and on reciprocal views between the Lincoln Memorial Grounds and the Washington Monument and Grounds. The cumulative impacts would be long-term negligible to minor adverse. The no action alternative would not result in impairment of cultural landscapes.

## **Cultural Landscapes Impacts of the Action Alternative**

### **ELM WALKS**

In the action alternative, lighting fixtures, benches, and trash receptacles along the elm walks would be refurbished and/or replaced. The iron-frame and wood-slat benches contribute to the significance of the Lincoln Memorial Grounds cultural landscape, while the lighting fixtures and trash receptacles are noncontributing, small-scale features. In the action alternative, all site furniture would be located on the side of the walks away from the Reflecting Pool to maintain unobstructed views of the Reflecting Pool and its green setting and to limit infiltration of artificial light into the Reflecting Pool area. Through the Section 106 process, the NPS is consulting with the DCHPO, NCPC, other consulting parties, and federal review agencies such as the CFA on certain design issues connected with the style, scale, function, spacing, and historic appropriateness of street furnishings to be selected and installed by the proposed action. The street furnishings include new replacement light standards, trash receptacles, and benches. Also under investigation is the replacement of the asphalt walkways, installed in 1971, with the original material, believed to be concrete.

As originally built, the elm walks did not have artificial lighting. The temporary lighting added in recent years detracts from night views of the Reflecting Pool and the Lincoln Memorial. Locating new lighting designed to fit into the landscape away from the Reflecting Pool would reduce night-time glare on the pool. Moving the light standards and other site furniture away from the Reflecting Pool would also help minimize their impact on views of the Lincoln Memorial and the World War II Memorial and limit the impacts of light infiltration on these resources. While the benches are contributing elements to the Lincoln Memorial Grounds cultural landscape, their arrangement and number do not contribute to the landscape's significance. By itself, therefore, moving the benches to the outer row of elm trees does not constitute an adverse impact on the cultural landscape.

Relocating the elm walk lighting and other site furnishings away from the Reflecting Pool would also help reinforce the important east-west axis of the Reflecting Pool/elm walks landscape. On the south side of the Reflecting Pool, however, this reinforced axis could interfere with an understanding of the spatial

relationship between the axial Reflecting Pool and the open, informal character of the remainder of West Potomac Park, including the DCWM cultural landscape. The Park's spatial organization is a character-defining feature of the East and West Potomac Parks Historic District. Since the Potomac Park Levee has already altered the spatial organization on the north side of the Reflecting Pool, the relocation of the site furnishings has no impact on the relationship between the Reflecting Pool and Constitution Gardens. The exact reconfiguration of the site furnishings and type of new lighting fixtures is not known at this time, but will be reviewed and approved by NCPC and CFA through the design review and approvals process. Therefore, it is assumed that the proposed actions would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Therefore, impacts would be direct, long-term, adverse, and minor on the south side of the Reflecting Pool.

In summary, the work planned for the elm walks would have direct, long-term, negligible or minor, adverse impacts on the setting, design, and spatial organization, of the Lincoln Memorial Grounds cultural landscape, while the impact on the DCWM cultural landscape would be negligible. The intensity of the impacts on the Lincoln Memorial Grounds would depend on the number, location, and design of the new site furniture. The work at the elm walks would not impact the cultural landscapes of Constitution Gardens or the Washington Monument and Grounds.

### **LINCOLN MEMORIAL EAST PLAZA**

Action alternative work on the east plaza would involve 1) the replacement of the current, noncontributing asphalt walkways between Lincoln Memorial Circle and the Reflecting Pool area with walks that comply with ADA/ABAAS guidelines; 2) rehabilitation of the contributing steps from Lincoln Memorial Circle to the Reflecting Pool level, as well as the noncontributing "approachway between the steps and the Reflecting Pool; 3) incorporation of security features into the pedestrian circulation system to replace the current temporary concrete barriers on the plaza; 4) the installation of a subsurface conduit to accommodate the utility needs of the two kiosks at the Lincoln Memorial; and 5) installation of two irrigation valves at the lower approachway to facilitate site watering.

The grading required to establish accessible walks would result in a realignment of the centerline of that segment of the Potomac Park Levee along the new northern walkway. Installation of the accessible walks would require that five trees be removed and replaced: two trees in the south elm walk and three trees in the north elm walk. One additional tree in the south elm walk would be removed, but not replaced. Another tree on the south side of the east plaza would also be removed, but not replaced, while five new trees would be added on each side of the plaza to fill in the concentric rings of elms along Lincoln Memorial Circle. There are three options for implementing the requirements for accessible walks in combination with security features, which are described and analyzed below.

#### **OPTION A1**

This option consists of a permanent vehicular barrier system integrated with the curvilinear, ADA/ABAAS-accessible paths from Lincoln Memorial Circle to the Reflecting Pool. The new walks would reconfigure and formalize the current, noncontributing, noncompliant asphalt walks. The new walks—one on each side of the existing terraced steps—would begin at the western terminus of the elm walks, follow a semicircular path to the Reflecting Pool level, cross the elm walks, and join the lower approachway where it meets the Reflecting Pool coping. The north-south walk on the western edge of the lower approachway would be rebuilt with new steps to meet the elm walks. Option A1 uses 42-inch-high bollards along the inner edge of the western half of the new walkway and 36-inch-high security walls around the outer edge of the remainder. The wall along the north walk would tie into the Potomac Park Levee.

The grade of the grass panels on either side of the Reflecting Pool would be lowered from east to west near the new walks to form trenches so the walks and their associated retaining walls would provide a security barrier in the manner of a ha-ha. The ha-ha walls would be 36 inches high from their base, below the current ground level. The floor of the Reflecting Pool would also be lowered at its western end so the Reflecting Pool and its granite coping become part of the secure perimeter. In locations where existing or new walks result in gaps in the secure perimeter, bollards would be used to complete the security system. In Option A1, these bollards would be aligned in a north-south direction across the elm walks and the new walks flanking the Reflecting Pool. As a beneficial impact, the current temporary concrete barriers and 36 of the bollards along Lincoln Memorial Circle (18 on either side of the plaza) would be removed if Option A1 were implemented.

As constructed under the guidance of the CFA, the Lincoln Memorial and its landscape employed a few spare, geometrical forms (circles and rectangles) and simple materials (marble, granite, grass, trees). The memorial's columns and the elm trees paralleling the Reflecting Pool were the only vertical elements in the composition. The addition of walks, bollards, post-and-chain fencing, and trash receptacles has already adversely impacted the characteristic simplicity of the western end of the Reflecting Pool. The addition of walks, walls, and bollards and the recontouring of the grass panels in this area as proposed in Option A1 formalizes and improves this features but continues that adverse impact. Rehabilitation of the steps rising to Lincoln Memorial Circle would have a beneficial impact on the Reflecting Pool landscape. Taken together, the changes to the pedestrian circulation network in Option A1 would have direct, long-term, minor adverse impacts on the design, materials, setting, and views of the Lincoln Memorial, the Reflecting Pool, and the elm walks. The impacts of the new work are confined in location and small in scale.

Among the contributing features of both the Lincoln Memorial Grounds and the Washington Monument and Grounds are reciprocal views between the memorials. In Option A1, the use of the ha-ha feature in the grass panels flanking the west end of the Reflecting Pool, the course of the new ADA/ABAAS-accessible paths along the elm walks, and removal of the temporary concrete barriers would help minimize impacts on these views. The accessible walks, security features, and system of bollards would, however, impact views of the Lincoln Memorial, the Reflecting Pool, and the relationship between the two as visitors near the western end of the Reflecting Pool. Option A1 would therefore have direct, long-term, minor adverse impacts on contributing views and vistas associated with the Lincoln Memorial Grounds and reciprocal views between the Lincoln Memorial and the Washington Monument.

Option A1 would result in direct, long-term, minor adverse impacts on the Constitution Gardens cultural landscape, mainly due to the realignment of a segment of the centerline of the Potomac Park Levee, a contributing feature of the gardens that functions as its southern boundary. As visitors approach the Lincoln Memorial and Reflecting Pool on the south side of the gardens, the realignment, along with the new accessible walk on the north side of the Reflecting Pool steps and its accompanying security features, would also have a minor adverse impact on views from the loop walk around Constitution Gardens, which contribute to the site's significance. This adverse impact would be minimized by the removal of 18 permanent bollards on the north side of Lincoln Memorial Circle and the temporary concrete barriers on the east side of the circle, which adversely impact current views of the memorial landscape.

Option A1 would have no impact on the DCWM cultural landscape due to the memorial's distance from the Reflecting Pool and the elevation of the new work, which is below the ground level of Lincoln Memorial Circle.

#### **OPTION A2**

This option is similar to Option A1 with two exceptions: 1) the vehicle barrier associated with the new ADA/ABAAS-accessible walks consists entirely of 42-inch-high bollards along the inner side of the

walks and 2) the ha-ha features are located on either side of the noncontributing lower approachway rather than flanking the west end of the Reflecting Pool.

As in Option A1, the addition of walks, walls, bollards, and trenches and lowering the Reflecting Pool slab in Option A2 impact several character-defining features of the Lincoln Memorial Grounds: 1) the geometric simplicity of the original design (spatial organization and topography); 2) the elm walks and Reflecting Pool steps (pedestrian circulation); and 3) the Reflecting Pool itself and the Reflecting Pool steps (structures). The impacts of the new work are confined in location and small in scale.

Among the contributing features of both the Lincoln Memorial Grounds and the Washington Monument and Grounds are reciprocal views between the memorials. In Option A2, the use of the ha-ha feature in the grass panels flanking the west end of the Reflecting Pool, the course of the new ADA/ABAAS-accessible paths along the elm walks, and removal of the temporary concrete barriers would help minimize impacts on these views. As visitors near the western end of the Reflecting Pool, the accessible walks, security features, and system of bollards would, however, impact views of the Lincoln Memorial, the Reflecting Pool, and the relationship between the two. Option A2 would therefore have direct, long-term, minor adverse impacts on contributing views and vistas associated with the Lincoln Memorial Grounds and reciprocal views between the Lincoln Memorial and the Washington Monument.

Option A2 would result in direct, long-term, minor adverse impacts on the Constitution Gardens cultural landscape, mainly due to the realignment of a segment of the centerline of the Potomac Park Levee, a contributing feature of the gardens that functions as its southern boundary. As visitors approach the Lincoln Memorial and Reflecting Pool on the south side of the gardens, the realignment, along with the new accessible walk on the north side of the Reflecting Pool steps and its accompanying security features, would also have a direct, long-term, minor adverse impact on views from the loop walk around Constitution Gardens, which contribute to the site's significance. This adverse impact would be minimized by the removal of 18 permanent bollards on the north side of Lincoln Memorial Circle and the temporary concrete barriers on the east side of the circle, which adversely impact current views of the memorial landscape.

Option A2 would have no impact on the DCWM cultural landscape due to the memorial's distance from the Reflecting Pool and the elevation of the work, which is below the ground level of the memorial.

### **OPTION A3**

As in the other two options, the addition of walks, walls, bollards, and trenches and lowering the Reflecting Pool slab in Option A3 impact several character-defining features of the Lincoln Memorial Grounds: 1) the geometric simplicity of the original design (spatial organization and topography); 2) the elm walks and Reflecting Pool steps (pedestrian circulation); and 3) the Reflecting Pool itself and the Reflecting Pool steps (structures). The impacts of the new work are confined in location and small in scale.

Among the contributing features of both the Lincoln Memorial Grounds and the Washington Monument and Grounds are reciprocal views between the memorials. In Option A3, the use of the ha-ha feature in the grass panels flanking the west end of the Reflecting Pool, the course of the new ADA/ABAAS-accessible paths along the elm walks, and removal of the temporary concrete barriers would help minimize impacts on these views. As visitors near the western end of the Reflecting Pool, the accessible walks, security features, and system of bollards would, however, impact views of the Lincoln Memorial, the Reflecting Pool, and the relationship between the two. Locating the bollards on the lower approachway in an east-west orientation would slightly decrease the overall adverse impact. Option A3 would therefore have direct, long-term, minor adverse impacts on contributing views and vistas associated with the Lincoln Memorial Grounds and reciprocal views between the Lincoln Memorial and the Washington Monument.

Option A3 would result in direct, long-term, minor adverse impacts on the Constitution Gardens cultural landscape, mainly due to the realignment of a segment of the centerline of the Potomac Park Levee, a contributing feature of the gardens that functions as its southern boundary. As visitors approach the Lincoln Memorial and Reflecting Pool on the south side of the gardens, the realignment, along with the new accessible walk on the north side of the Reflecting Pool steps and its accompanying security features, would also have a minor adverse impact on views from the loop walk around Constitution Gardens, which contribute to the site's significance. This adverse impact would be partly mitigated by the removal of 18 permanent bollards on the north side of Lincoln Memorial Circle and the temporary concrete barriers on the east side of the circle, which adversely impact current views of the memorial landscape.

Option A3 would have no impact on the DCWM cultural landscape due to the memorial's distance from the Reflecting Pool and the elevation of the work, which is below the ground level of the memorial.

#### **REFLECTING POOL PEDESTRIAN CIRCULATION SYSTEM**

The current dirt paths flanking the Reflecting Pool already constitute a moderate adverse impact that would likely increase in intensity as the paths deteriorate further. Formalizing these walks with hardscape would improve this situation. The pavement would, however, replace a portion of the intended grass border of the pool, resulting in an adverse impact to that character-defining element of the design as originally implemented. The new walks would also adversely impact views from the Washington Monument as well as from the Reflecting Pool area itself. These views, however, are already adversely impacted by the dirt paths that the paved walks would replace. Although the exact design of the walkways, including their materials,<sup>3</sup> color, and paving pattern, is not known at this time, the new walks would be of a scale commensurate with the compositional features of the Lincoln Memorial landscape. The final design would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. The National Park Service anticipates the resolution of this direct, long-term adverse impact to minor intensity through this consultation.

#### **REFLECTING POOL STRUCTURAL SYSTEM**

As indicated earlier, NPS is contemplating three options to address problems with the structural system of the Reflecting Pool. All three seek to stabilize the Reflecting Pool structure and prevent leaks while maintaining the reflective quality that is a significant aspect of the Reflecting Pool surface. The existing granite coping, a contributing characteristic of the Reflecting Pool, would be reused in each option. The three options are discussed below.

##### **OPTION B1**

Only cracks and deficiencies in the current Reflecting Pool structural system would be addressed in Option B1. The underlying causes of the deterioration of the Reflecting Pool structure would not be addressed. Work would include repair in place of the foundation slab, perimeter grade beam, joints, and granite coping, and the Reflecting Pool would be drained while the work is completed. Studies indicate that approximately 20 percent of the Reflecting Pool structure requires repair. Undertaken according to the Secretary of the Interior's Standards, Option B1 would result in a direct, long-term minor to moderate beneficial effect on the Reflecting Pool, a contributing structure in the Lincoln Memorial Grounds cultural landscape. The intensity of the effect would depend on the extent of the repair undertaken.

##### **OPTION B2**

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<sup>3</sup> It is important to note that the use of concrete—the material of the nonhistoric arrangement around the east end of the Reflecting Pool—could give the false impression that the walks were original to the Reflecting Pool's construction.

In Option B2, the existing slab, grade beam, and piles would be removed and a new foundation slab and piles constructed. NPS is considering two types of piles to support the slab. In Option B2.1, a grid of new grouted piles would be installed beneath the footprint of the Reflecting Pool to a depth of approximately 40 feet, creating compression and compaction of the soil. Crushed aggregate and a concrete slab would be poured over the grid of piles. Option B2.1 could be expected to result in uniform and minimal settlement over the long-term life (100 years) of the Reflecting Pool. In Option B2.2, the supporting system would be composed of a framed slab and beam resting on piles reaching to bedrock. A concrete slab would be poured over the framing system. Option B2.2 could be expected to result in uniform and negligible settlement over the long-term life of the Reflecting Pool.

The Reflecting Pool is a contributing structure in the Lincoln Memorial Grounds cultural landscape. Removal of historic fabric in both of the B2 options constitutes an adverse impact on this feature. The Reflecting Pool's significance, however, rests on its importance as a design feature of the McMillan Plan for Washington, its place in the landscape design of the Lincoln Memorial grounds, its association with Abraham Lincoln and Martin Luther King, Jr., and contributions to its design by several noted landscape architects, especially Frederick Law Olmsted, Jr. Alterations to the pool under the B2 options would be internal to the structure and not readily visible. The Reflecting Pool would be used as it was historically, and the historic character of the property would be retained. The B2 options would have the beneficial impact of addressing underlying structural problems of the Reflecting Pool and repairing its granite coping. Due to the removal of the existing slab, grade beam, and piles, however, Option B2 is judged to constitute a long-term, minor, adverse impact on the Reflecting Pool structure. During the period of construction, the rehabilitation of the Reflecting Pool in the B2 options would also have direct, temporary, minor adverse impacts on the grassy border of the Reflecting Pool, as well as associated views, both of which are contributing features of the cultural landscape. The temporary adverse impacts would also extend to views to and from the Washington Monument Grounds and Constitution Gardens.

### **OPTION B3**

In this option, a new, monolithic concrete structural system would be installed that ties together the foundation slab, grade beam, coping, and adjacent sidewalk. No new piles would be installed. This system could be expected to result in uniform, negligible settlement over time.

As is the case in the B2 options, removal of historic fabric in Option B3 constitutes an adverse impact on the Reflecting Pool. Option B3 has the beneficial effect of addressing underlying structural problems of the Reflecting Pool and repairing its granite coping. Due to the removal of the existing slab, grade beam, and piles, however, Option B3 is judged to constitute a long-term minor, adverse effect. During the period of construction, the rehabilitation of the Reflecting Pool in Option B3 would also have direct, temporary, minor adverse effects on the grassy border of the Reflecting Pool, as well as associated views, both of which are contributing features of the cultural landscape.

### **REFLECTING POOL WATER SYSTEM**

The action alternative for the rehabilitation of the Reflecting Pool includes three options designed to improve the efficiency of the water system (supply, quality, discharge). The reader is directed to the description of each in a previous section of this chapter, "Historic Districts and Structures."

### **OPTION C1**

Potential adverse impacts from Option C1 would derive from excavation for the construction of the underground pipes and subsurface vaults and visibility of above-ground elements. The impacts on green spaces from trenching and excavation would generally be temporary, and care would be taken to avoid permanent impacts to elm trees. The proposed locations of the subsurface vaults in Option 1 are, generally speaking, in less significant areas of the West Potomac Park. While the exact design of the small structures and subsurface vaults is not known at this time, it seems likely that the adverse impact of

the implementation of Option C1 would be direct, long-term, and minor due to the location of the interventions.

### **OPTION C2**

Potential adverse impacts from Option C2 would derive from excavation for the construction of the underground pipe and the subsurface vaults and the visibility of above-ground elements. The impacts on green spaces from trenching and excavation would generally be temporary, and care would be taken to avoid permanent impacts to trees on the elm walks and in Constitution Gardens. The exact design of the above-ground elements of the subsurface vaults is not known at this time, and their location in the grass panel on the north side of the Reflecting Pool has the potential to add to the adverse impacts of the proposed walk flanking the pool. The design of these features will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. Therefore, it is assumed that they would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Review of these design issues by the DC HPO, NCPC, and CFA would be assumed to mitigate the adverse impact to the level of minor or below.

### **OPTION C3**

As in Option C1, potential adverse impacts to cultural landscapes in Option C3 would derive from excavation for the construction of the underground pipes from the Potomac River and the Tidal Basin to the Reflecting Pool and from the installation of subsurface vaults and their of above-ground features. Option C3's direct, long-term adverse impacts would be limited to the Lincoln Memorial Grounds cultural landscape and would potentially include contributing features such as the American elms flanking Daniel French Drive, the south elm walk, the grassy border around the Reflecting Pool, and the Reflecting Pool itself. Contributing resources that would receive direct, temporary adverse impacts lasting through the construction period include Daniel French Drive, the grass panel between 23rd Street and Daniel French Drive, and the sidewalks on the northeast side of Daniel French Drive.

### **CUMULATIVE IMPACTS**

The other projects within or near the APE for the action alternative for the Reflecting Pool Rehabilitation are the same as for the no action alternative. As indicated earlier, their impacts on historic districts and structures range from long-term beneficial to minor adverse. The overall assessment below of the impacts upon cultural landscapes of the action alternative is that all components have been shaped through Section 106 consultation to remain at or below the minor adverse level. Therefore, the cumulative impact would be a range of long-term beneficial to minor adverse

### **CONCLUSION**

The impacts on contributing cultural landscapes within the APE resulting from any combination of the action alternative options can be described in a preliminary manner as direct, long-term, minor, and adverse. The exact design of certain elements, materials, structures, and equipment is not known at this time, but all design features will be reviewed and approved by NCPC and CFA through the design review and approvals process. Therefore, it is assumed that the proposed actions would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Review of these design issues by the DC HPO, NCPC, and CFA would be assumed to mitigate the adverse impact to the level of minor or below.

The work of reorganizing and rehabilitating or replacing site furniture in the elm walks would have its chief potential impact on the relationship between the Lincoln Memorial Grounds cultural landscape and the parkland on either side, which includes the Constitution Gardens cultural landscape on the north. Due

to the presence of the Potomac Park Levee on the north, the potential adverse impacts occur only on the south side of the Reflecting Pool. No impact is expected related to the DCWM due to its distance from the new work.

All of the options described in the action alternative regarding installation of accessible walks combined with security features would have direct, long-term, minor adverse impacts on the Lincoln Memorial cultural landscape, especially the design and setting of the Reflecting Pool and views associated with it and the southwest sector of the Constitution Gardens cultural landscape. The accessible walks and security features are small in scale and confined to a small area (the west end) of a large composition. The exact design of the new walkways flanking the Reflecting Pool, including their materials, color, and paving pattern, is not known at this time. The final design would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. The National Park Service anticipates the resolution of this direct, long-term adverse impact to minor intensity through this consultation.

Option B1 in the action alternative would constitute a minor to moderate beneficial impact on the Lincoln Memorial Grounds cultural landscape if the rehabilitation follows Secretary of the Interior Standards. The intensity of the impact would depend on the extent of the repairs to the Reflecting Pool and its coping. Both Option B2 and Option B3 would result in direct, long-term, minor adverse impacts due to the demolition of some of the Reflecting Pool's historic fabric in order to stabilize the Reflecting Pool structure. The adverse impacts in both options would be confined to nonvisible parts of the Reflecting Pool and would not impact character-defining features, including size, shape, location, and reflectivity. The rehabilitation of the Reflecting Pool in the B2 and B3 options would have direct, temporary, minor adverse impacts during construction on the grassy border of the Reflecting Pool, as well as associated views, both of which are contributing features of the cultural landscape. The temporary adverse impacts would also extend to views to and from the Washington Monument Grounds and Constitution Gardens.

Potential adverse impacts from all three water system options derive mostly from excavation for the construction of the underground pipes and subsurface vaults and the visibility of above-ground elements. These impacts mainly concern views of nearby contributing features. In Options C1 and C3, the pipes run from the Reflecting Pool to the Potomac River and the Tidal Basin. The subsurface features would be invisible from the Reflecting Pool area, although they would be visible in their immediate vicinity in West Potomac Park. The exact design of the above-ground elements of the subsurface vaults is not known at this time. Adverse impacts of either Option C1 or Option C3 would be long-term, adverse, and minor due to their relatively inconspicuous location. In Option C2, the subsurface vaults south of the south elm walk, in combination with the relocation of site furnishings would have direct, long-term, minor adverse impacts on the spatial relationship between the Lincoln Memorial Grounds and the DC War Memorial cultural landscapes. The design of these features will be reviewed and approved by NCPC, CFA, and the DC HPO through the design review and Section 106 processes. Therefore, it is assumed that they would be consistent with the visual character of the project area and adjacent historic resources and would conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Review of these design issues by the DC HPO, NCPC, and CFA would be assumed to minimize the adverse impact to the level of minor or below. There would be no impairment to cultural landscapes from the action alternative.



## Aesthetics and Visual Resources

### METHODOLOGY AND ASSUMPTIONS

This visual impact assessment addresses potential changes to the project area's visual character, views, and vistas that would result from implementation of the proposed actions. A site survey, existing photographs, and three-dimensional (3d) visualizations prepared by the consultant design team were used for this analysis.

### PROJECT AREA

The study area for visual resources includes the National Mall in the vicinity of the Reflecting Pool and vistas that extend along the grand axis created by the Lincoln Memorial, Reflecting Pool, Washington Monument, and U.S. Capitol Building.

### IMPACT THRESHOLDS

The following thresholds were used to determine the degree of impacts on visual resources in the project area:

*Negligible:* The proposed action would not impact the aesthetics or visual viewshed of the proposed project area during construction or operations.

*Minor:* The proposed action would not substantially change the scenic vista, would not substantially change scenic resources, and would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight, and would minimally diminish overall integrity, or affect the character defining feature(s) of the visual resources and aesthetic environment.

*Moderate:* The proposed action would result in a noticeable effect on a scenic vista; alter scenic resources, including but not limited to, trees and historic buildings; or alter the existing visual character or quality of the site and its surroundings. The effect would diminish overall integrity, or would alter a character defining feature(s) of the visual resources and aesthetic environment.

*Major:* The proposed action would result in a substantial effect on a scenic vista; substantially alter scenic resources, including but not limited to, trees and historic buildings; or substantially alter the existing visual character or quality of the site and its surroundings. The effect would significantly diminish overall integrity, or would significantly alter a character defining feature(s) of the visual resources and aesthetic environment.

*Duration:* In the short term, the most negative visual impacts would be related to the activity and disruption associated with construction. The long-term impacts would be related to compromised, obscured, or disrupted views from the areas where the proposed actions would occur.

### Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and Lincoln Memorial east plaza.

### ELM WALKS

Along the length of both elm walks, the benches, trash receptacles, and lighting fixtures would continue providing visitor comfort and would not change in quality or volume.

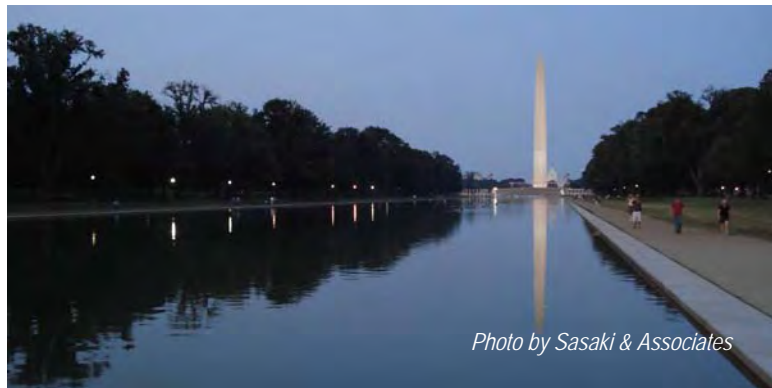
*Visual Character:* The principal visual features along the walkways are the mature elms that line the walkways, which would remain unchanged. However, the deteriorating asphalt, non-compliant walkways at the west termini, worn benches, and temporary light fixtures would continue to detract from the visual character of the historic elm walks, creating a long-term minor adverse effect because the visual impact is detectable, but slight in the context of the overall setting.

*Views and Vistas:* The perspective long views down the elm walks are primarily defined by the repetition of mature elm trees. The existing configuration of site furnishings does not substantially detract from these views, resulting in a negligible effect.

The views along the elm walks toward the Reflecting Pool are minimally affected by the location of the lighting fixtures on the inbound side of the walkways. However, these do not substantially obscure or detract from the views so the effect is negligible. In sum, the no action alternative would be a negligible adverse effect on views and vistas along the elm walks.

*Illumination:* The existing fixtures do not currently cast omni-directional light; instead, they have been modified to direct the intensity of the light onto the elm walks and away from the Reflecting Pool to minimize glare or reflection onto the surface of the water. Nevertheless, their location on the inbound side of the elm walks and their proximity to the Reflecting Pool results in a minor adverse effect at night because their reflection onto the surface of the Reflecting Pool (see Figure 4.2) creates a detectable but slight impact in the overall context of the area.

Figure 4.2 – Nighttime Reflection of the Existing Lighting Fixtures



## LINCOLN MEMORIAL EAST PLAZA

*Visual Character:* The visual character of this area is defined by the lower approachway stairs and landings, the concentric ring of mature trees that flank the Lincoln Memorial Circle, and the perimeter security elements (metal bollards and temporary concrete barriers). These elements all provide a backdrop for the Lincoln Memorial to the west.

The existing visual quality of the lower approachway is compromised by numerous deficiencies in the stairs and landings. Although these deficiencies are adverse, they are minor in intensity because they do not substantially change the integrity of the existing visual quality of the site; the resultant effect is detectable but slight in the overall context of the area.

The metal bollards were approved by CFA and NCPC in 2007. The color and material complement the adjacent lower approachway, while the form and scale defer to the views and monumentality of the Lincoln Memorial, responding to the formal monumentality of the site (NPS 2002). The design for the temporary concrete barriers was approved in 2008 and they were placed on site the end of the construction period in 2008. The presence of the metal constitutes a long-term minor adverse effect since they do not substantially change the integrity of the existing visual quality of the site; the resultant effect is detectable but slight in the overall context of the area.

The material of the temporary concrete barriers is intended to visually suggest the temporary, rather than permanent nature of the features (NPS 2002). Due to the careful, sensitive, and rigorous design of these temporary concrete barriers, their presence results in a long-term minor adverse effect, as they do not substantially alter the scenic resources of the project area.

*Views and Vistas:* The views and vistas toward the Lincoln Memorial are not affected by the existing condition of the lower approachway and are affected to a minor extent by the presence of the perimeter security devices. These bollards and temporary concrete barriers generate a long-term minor adverse effect since they do not substantially change the scenic vistas but create a detectable but slight effect in the overall context of the area.

#### **REFLECTING POOL**

*Visual Character of Site:* The worn dirt paths that flank the Reflecting Pool and the deteriorating joints and coping detract from the visual character of the Reflecting Pool and the ability of visitors to appreciate the resource as an element in an open lawn, a central component to the landscape design intent. As a result, there is currently a long-term moderate adverse effect since there is a noticeable impact on the visual quality of the area immediately around the Reflecting Pool which diminishes its overall integrity.

In addition, short-term impacts result from the current method of cleaning the Reflecting Pool. Once to twice annually, it is drained for a duration of 10 to 14 days, a process which creates a noticeable effect on a critical component of the scenic vista, resulting in a short-term moderate adverse effect.

*Views and Vistas:* The Reflecting Pool is the central axis feature of the designed landscape comprising the vista connecting the Washington Monument and the Lincoln Memorial. The worn dirt paths compromise the integrity of this grand vista of the Mall, creating a long-term moderate adverse effect since there is a noticeable effect on the scenic vista, both from aerial (views from the Washington Monument) and ground views.

#### **CUMULATIVE IMPACTS**

Construction of the VVMC, the USIP, NMAAHC and the MLK Memorial, and Lincoln Memorial security improvements and Potomac Park Levee improvements would impact the visual resources within the project area.

The USIP is establishing its new headquarters in a new building located off the Mall on the northwest corner of 23rd Street and Constitution Avenue. This project would result in a long-term moderate adverse impact on the existing visual character since it would introduce levels of illumination at night that could potentially rival the Lincoln Memorial and World War II Memorial.

The Lincoln Memorial Circle Rehabilitation and Security Improvements introduced transportation and security improvements to the west of the project area. In 2008, a series of bollards was placed around the circle on the east side of the Memorial. There were negligible adverse visual impacts associated with this project because the design and materials are intended to preserve the aesthetic qualities of the area and are compatible with the cultural landscape and historic setting of the Lincoln Memorial and surrounding Park resources (NPS 2002a).

Security improvements at the Jefferson Monument are also planned and would have similar negligible effects on visual resources since the design preserved the aesthetic qualities of the area and ensured continued access to the Jefferson Monument.

Construction of the VVMC would result in a negligible effect on the existing visual character around the project area because the facility will be underground and no existing vegetation or protected vistas of the Park would be affected (NPS 2006d).

The Potomac Park Levee improvements will introduce landscape regrading along the existing levee berm (the northern boundary of the project area) and the removal and replacement of a substantial number of trees along 17th Street adjacent to Constitution Gardens. These actions would create a long-term minor adverse effect in the surrounding area.

The NMAAHC will be constructed by 2016 on the National Mall at the southwest corner of 14th Street NW and Constitution Avenue NW, on the Washington Monument Grounds. The presence of a new building in this location would affect the vista between the U.S. Capitol Building, Washington Monument, World War II Memorial, and the Lincoln Memorial, creating a long-term adverse impact on visual resources that will range from minor to moderate, depending on the design (which is currently in progress with the Smithsonian Institution).

These projects on and around the National Mall generate visual cumulative impacts that are long-term, adverse, and range between minor to moderate. When combined with the long-term moderate adverse impacts associated with the no action alternative, there is a net long-term minor to moderate adverse cumulative impact.

## **CONCLUSION**

The condition of the existing deficiencies, such as the uneven and irregular walking surfaces, worn site furnishings, deteriorating stairs and landings, constitute a long-term minor adverse effect on the visual character in the project area. The vistas within the project area are character-defining features of the Lincoln Memorial cultural landscape. Currently, the worn dirt paths that flank the Reflecting Pool compromise this grand vista, resulting in a long-term moderate adverse impact.

The cumulative impacts on the visual resources of the National Mall and the project area, when combined with the long-term moderate adverse impacts associated with the no action alternative, would result in net long-term minor to moderate adverse cumulative impacts.

The no action alternative would not result in impairment to visual resources in the project area.

## **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

### **ELM WALKS**

Along the length of both elm walks, the walking surface would be resurfaced and the benches, trash receptacles, and lighting fixtures would be rehabilitated and/or replaced and reconfigured to improve visitor comfort. Drinking fountains would be installed at planned intervals and new permanent lighting fixtures would replace the existing temporary light fixtures. The site furnishings would be relocated to the outboard side of the walkways, furthest away from the Reflecting Pool.

*Visual Character:* The improved quality of the existing walking surfaces, benches, and trash receptacles and the addition of new permanent lighting fixtures would enhance the visual character of the elm walks. The consolidation of site furnishings on the outboard side of the walkways would have a negligible effect on the visual character of the project area since the principal visual elements are the mature elm trees, which would remain unchanged. The new fixtures would be consistent with the historic character of the elm walks and would represent an improvement over the existing temporary fixtures that are mounted on concrete cylinders. There would be no effect

resulting from the installation of water fountains or irrigation valves at numerous points along the walkways because they would not substantially contribute to the overall scenic quality of the area or are too small to be visually detected.

*Views and Vistas:* Since the perspective long views down the elm walks are primarily defined by the repetition of mature elm trees, the proposed reconfiguration of site furnishings would not substantially detract from these views, despite the addition of drinking fountains, and would have a negligible effect. The views toward the Reflecting Pool would be beneficially impacted by consolidating the site furnishings to the outboard side of the elm walks since they would leave the views toward the Reflecting Pool to be framed solely by the elm trees.

*Illumination:* There would be a long-term beneficial effect resulting from the installation of new levels of nighttime illumination along both elm walks since the lights would provide more light but would not generate any ambient reflection or glare onto the surface of the adjacent Reflecting Pool.

*Short-term Impacts:* There would be short-term minor adverse effects resulting from construction since the presence of construction equipment and the disruption of the project area would be detectable, but slight, and would minimally diminish overall integrity. Overall, the proposed actions would result in long-term beneficial impacts to the visual resources along the elm walks and short-term minor adverse impacts resulting from construction activity.

#### **LINCOLN MEMORIAL EAST PLAZA**

*Visual Character and Views and Vistas:* The installation of irrigation valves and subsurface conduit to the kiosks would have no long-term visual effect on the project area since they would be located underground. The proposed site circulation options that integrate new accessible paths with perimeter security would substantially affect the project area. The range of options would replace the temporary concrete barriers and result in the removal of 36 metal bollards around the Lincoln Memorial Circle, representing a long-term beneficial impact. While these options would avoid the historic fabric of the lower approachway, they would introduce new visual features to the project area. In all options, curvilinear paths would create an accessible connection between the Lincoln Memorial east plaza, the elm walks, and the lower approachway terrace in a manner that complements adjacent curvilinear walkways that lead to the Vietnam Veterans and Korean War Veterans Memorials. The opportunity to harmoniously blend two previously disparate landscapes would create a long-term beneficial impact. Installation of these new walkways would require the removal and replacement of several trees around the Reflecting Pool and east plaza. Two trees would be removed, but not replaced. The loss of these trees would be offset by the addition of five new trees adjacent to the east plaza to fill in the concentric rings of elms along Lincoln Memorial Circle, resulting in a net long-term beneficial impact. Other impacts between Options A1, A2, and A3 need to be considered and are described below.

*Option A1*—In this option, a combination of bollards and security walls would flank the new curved walkways. Security walls would be aligned to the outside of the curved walkways and with the west coping of the Reflecting Pool and would have handrails. On either side of the Reflecting Pool, in the area between the new flanking walkways and the elm walks, ha-has, or trenches, would be used to foreshorten the visible portion of security wall. The effect that the trenches would have on the topography in the area is not consistent with the historic grading and would result in a substantial visual impact to the visual character adjacent to the Reflecting Pool. To complete the vehicular barrier, a short row of bollards would run across both elm walks and the new walkways that flank the Reflecting Pool. These would affect the views down both walkways on the approach from the east.

As a result of the non-historic grading and the more pronounced visual effect of the walls and bollards that would traverse the elm walks and new walkways by the Reflecting Pool, there would be a long-term moderate adverse effect on visual resources. When combined with the long-term beneficial impacts of the elements common to Options A1, A2, and A3, however, the net visual effect of Option A1 would be a long-term minor adverse effect.

*Option A2*—In this option, bollards would be used primarily along the inner side of the walkways to provide perimeter security. Security walls are used in the area adjacent to the lower approachway terrace but are set back from the walkways that flank the Reflecting Pool. At these locations, trenches would be used to foreshorten the visible portion of wall. The effect that the trenches would have on the topography in the area is consistent with the historic grading and would result in less of a visual impact to the visual character of the areas compared to Option A1. .

To complete the vehicular barrier, a short row of bollards would run across both elm walks and the new walkways that flank the Reflecting Pool. These would affect the views down both walkways on the approach from the east.

This option would leave the visual character of the area more open, but it would introduce a substantial amount of bollards to the area, which are non-historic landscape elements and inconsistent with the visual character of the area.

As a result of the introduction of new bollards, particularly those that traverse the elm walks and new walkways by the Reflecting Pool, there would be a long-term moderate adverse effect on visual resources. When combined with the long-term beneficial impacts of the elements common to Options A1, A2, and A3, however, the net visual effect of Option A2 would be a long-term minor adverse effect.

*Option A3*—In this option, security walls would be primarily used along the inner side of the walkways to provide perimeter security. The slope of the walkways in Option A3 would be shallower than in Option A1, therefore no handrails would be required along the security walls. In the area adjacent to the lower approachway terrace, security walls and trenches would be set back from the walkways that flank the Reflecting Pool. The ha-ha would reduce the visible portion of wall. The effect that the trenches would have on the topography in the area would be consistent with the historic grading and would result in less visual impact to the visual character of the areas compared to Option A1.

To complete the vehicular barrier, a short row of bollards would run across both elm walks but not across the new walkways that flank the Reflecting Pool. At this location, they would be orientated east-west and would not be visible on the approach from the east.

This option creates a unified visual character and generates a net loss of bollards in the entire project area. The walls would be designed to recede into the landscape and to be consistent with low walls in other parts of the National Mall, such as on the Washington Monument Grounds.

Although this option would introduce new security walls, it would result in a net loss of bollards and fewer visual obstructions of views looking west from the east of the project area. The curved walkways would be gently sloped and would not require handrails. As a result, there would be a long-term minor adverse effect, but when combined with the long-term beneficial impacts of the elements common to Options A1, A2, and A3, the net visual effect of Option A2 would be a long-term negligible to minor adverse effect.

*Short-term Impacts*—There would be short-term moderate adverse effects to the project area resulting from construction activities since the lower approachway and portions of the elm walks would be closed and views to the Lincoln Memorial would be obstructed during this time.

**REFLECTING POOL PEDESTRIAN CIRCULATION SYSTEM**

The worn dirt paths that flank the Reflecting Pool would be paved with a material, color, and pattern that would be consistent with the historic resources in the project area and would harmoniously blend with the World War II Memorial walkway around the east end of the Reflecting Pool. In addition, the formalization of these paths would restore the historic vista to the project area, further contributing to long-term beneficial impacts.

**REFLECTING POOL STRUCTURAL SYSTEM**

The long-term visual effects in Options B1, B2, and B3 would be the same because in all options, improvements to the foundation slab and grade beam would not be visible and the existing deficiencies, particularly the granite coping and joints, would be rehabilitated to the same visual effect.

There would however, be varying degrees of short-term impacts due to construction, depending on which option is implemented.

*Option B1*—A partial reconstruction of the foundation slab, grade beam, joint system, and granite coping would require approximately nine months to complete, during which time the Reflecting Pool would be empty and access would be limited to visitors within the project area. The construction activity and absence of water in the Reflecting Pool would result in a noticeable effect on a scenic vista because it would alter the existing visual character and quality of the site and adversely impact the historic, character-defining feature of the cultural landscape. As a result, construction activity of this option would result in a short-term moderate adverse effect.

*Options B2 and B3*—A full reconstruction of the foundation slab, grade beam, joint system, and granite coping would require approximately 21 months to complete, during which time the Reflecting Pool would be empty and access would be limited to visitors. The construction activity and absence of water in the Reflecting Pool would result in a noticeable effect on a scenic vista because it would alter the existing visual character and quality of the site and adversely impact the historic, character-defining feature of the cultural landscape. As a result, construction activity of this option would result in a moderate adverse effect for the duration of construction, which would be long-term but not indefinite.

**REFLECTING POOL WATER SYSTEM**

There are three options for improving the water system at the Reflecting Pool. Options C1, C2, and C3, once implemented, would have the same negligible effects on the Reflecting Pool itself since none of them would affect the aesthetics of the water or the circulation around the Reflecting Pool. However, each option varies in the type and size of infrastructure required in the surrounding project area to support the water system. As a result, there are varying degrees of effects across Options C1, C2, and C3.

*Option C1*—To support a new point of intake at the Potomac River in West Potomac Park, a new pump station and subsurface electrical vault would be constructed. The existing method of discharge to the Tidal Basin would be maintained. The new pump station would be a 15 foot by 15 foot structure designed to be consistent in style and material with other structures in the surrounding cultural landscape. The new structure would be visible from points from within West Potomac Park and minimally visible from the top of the Washington Monument. Its presence would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight and would therefore produce long-term minor adverse impacts.

*Option C2*—The existing method of water supply from the municipal source would be maintained. To support a new point of discharge, a new subsurface pipe would be installed from the Reflecting Pool, north to the existing sanitary line along Constitution Avenue. This new pipe would be installed beneath Constitution Gardens and would require a subsurface electrical vault to house the pump to the

sanitary sewer. This vault would be located to the north of the Reflecting Pool and would have a long-term minor adverse effect since it would not substantially change the scenic vista, nor substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight.

At the Reflecting Pool, the ultrasonic transducers used to treat the water and enhance the water quality would be installed below the surface of the water and would not be visible. They would be fed by several electrical power sources housed in four subsurface concrete vaults, installed to the south of the southern elm walk. The resulting visual impacts would be adverse and long-term but minor because the subsurface vaults would not be within a historically significant viewshed and would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight.

*Option C3*—To support a new point of intake at the Tidal Basin in West Potomac Park, a new pump station and subsurface electrical vault would be constructed. A new subsurface pipe to support the point of discharge in West Potomac Park, south of Ohio Drive, would be installed. The new pump station would be a 15 foot by 15 foot structure, designed be consistent in style and material with other structures in the surrounding cultural landscape. The new structure would be visible from points from within West Potomac Park around the Tidal Basin and would be visible from the top of the Washington Monument. However, its presence would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight and would therefore produce long-term minor adverse impacts.

*Short-term Impacts*—Each option would have short-term moderate adverse effects due to the presence of construction equipment and the absence of water in the Reflecting Pool for the duration of construction.

#### **CUMULATIVE IMPACTS**

The projects on and around the National Mall generate visual cumulative impacts that are long-term, adverse, and range between minor to moderate. When combined with the long-term minor adverse impacts associated with the action alternative, there would be a net long-term minor to moderate adverse cumulative impact.

#### **CONCLUSION**

The proposed actions along the elm walks would result in long-term beneficial impacts to the visual resources and short-term minor adverse impacts resulting from construction activity. Options A1 and A2 would result in long-term minor adverse impacts, while Option A3 would have only negligible to minor adverse effects on the visual resources, views, and vistas around the Reflecting Pool.

The structural enhancements would have similar long-term beneficial impacts resulting from the rehabilitated deficiencies including the granite coping and joints. Option B1 would have short-term moderate adverse impacts due to the duration of construction when the Reflecting Pool would be empty. Options B2 and B3 would have moderate adverse effects for the duration of construction, which could be long-term (approximately 21 months in duration), but not permanent.

The water system options vary in their level of effect because each option introduces equipment and/or structures that would affect the visual character of the project area. All three options would introduce a new subsurface concrete pump stations to the project area in separate locations, which would introduce long-term adverse effects, but the stations would be designed in a manner that would not yield effects above a threshold of minor. When combined with the long-term minor adverse impacts associated with the action alternative, there would be a net long-term minor cumulative adverse impact. There would be no impairment to visual resources as a result of implementing any option of the action alternative.



## Water Resources

### METHODOLOGY AND ASSUMPTIONS

For the purposes of this document, the term “water resources” is inclusive of the water supply (or source), water quality, and water discharge in the Reflecting Pool and adjacent water bodies.

The NPS *Management Policies 2006* states that the NPS will “take all necessary actions to maintain or restore the quality of surface waters and ground waters within the Parks, consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations” (NPS 2001a sec 4.6.3).

A water quality standard defines the water quality goals of a water body by designating uses to be made of the water, setting minimum criteria to protect the uses, and preventing degradation of water quality through anti-degradation provisions. The anti-degradation policy is only one portion of a water quality standard. Part of this policy (40 CFR 131.12(a)[2]) strives to maintain water quality at existing levels if it is already better than the minimum criteria. Anti-degradation should not be interpreted to mean that “no degradation” can or will occur, as even in the most pristine waters, degradation may be allowed for certain pollutants as long as it is temporary and short-term.

### STUDY AREA

The geographic study area for water resources and water quality includes the Reflecting Pool, the Tidal Basin, and the Potomac River in the vicinity of the project. The ponds in Constitution Gardens are not affected by any of the proposed actions in this analysis and are therefore not included in the study area.

### IMPACT THRESHOLDS

The following thresholds were used to determine the magnitude of impacts on waters resources and water quality:

*Negligible*—Impacts (chemical, physical, or biological) would not be detectable, would be within water quality standards or criteria, and would be within historical or desired water quality conditions. All permit requirements would be met. Impacts on water or wastewater treatment facilities would not be detectable.

*Minor*—Impacts (chemical, physical, or biological) would be detectable but would be within water quality standards or criteria and within historical or desired water quality conditions. All permit requirements would be met. Impacts on water or wastewater treatment facilities would be detectable, but would not affect or disrupt plant operations or water demands. Mitigation, if needed, would be simple and successful.

*Moderate*—Impacts (chemical, physical, or biological) would be detectable but would be at or within water quality standards or criteria; however, historical baseline or desired water quality conditions would be temporarily altered. Necessary permits could be obtained and requirements would be met most of the time. Impacts on water or wastewater treatment facilities would be detectable, and could affect or disrupt plant operations or water demands from other customers. Mitigation measures to offset potential adverse impacts could be extensive, but would be successful.

*Major*—Impacts (chemical, physical, or biological) would be detectable and would be frequently altered from the historical baseline or desired water quality conditions and/or chemical, physical, or biological water quality standards or criteria would temporarily be slightly and singularly exceeded. There would be substantial difficulty obtaining permits or meeting permit requirements. Necessary permits could be obtained and requirements would be met most of the time. Impacts on water or

wastewater treatment facilities would be detectable, and would frequently affect or disrupt plant operations or water demands from other customers. Mitigation measures to offset potential adverse impacts would be extensive and their success could not be guaranteed.

*Duration*—Short-term impacts would take less than one year to recover after the disturbance or change occurs; long-term impacts would take longer than one year to recover after the disturbance or change occurs.

## Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and Lincoln Memorial east plaza.

### ELM WALKS AND EAST PLAZA

The continuation of the current management and maintenance of assets and resources along the elm walks and at the east plaza would have no effect on water resources.

### REFLECTING POOL

The Reflecting Pool is currently filled using potable water from the District's municipal water supply. This water has been treated with chloramine, a disinfection chemical commonly used to treat drinking water that is slow to degrade. The NPS further treats the water in the Reflecting Pool with an organically certified algaecide.

The current method of discharge to the Tidal Basin is not in compliance with current Clean Water Act requirements. Under the no action alternative, the discharge water quality of the Lincoln Reflecting Pool would be monitored to ensure water discharge is better than or equal to the quality of the Tidal Basin water. The NPS would need to rehabilitate the water system, establish discharge water quality parameters, and monitor the quality of the Reflecting Pool water to comply with District of Columbia and EPA water quality regulations and NPS standards for sustainability.

This is important, as the Tidal Basin and the downstream Washington Ship Channel or Washington Channel, as well as the Potomac River, are currently listed as impaired for fecal coliform (a bacterium used as an indicator of the presence of other pathogens often associated with organic waste in the water) under section 303(d) of the CWA.<sup>4</sup> The District and the EPA have developed a TMDL for this impairment (DC 2004b), as required by the CWA. The TMDL stipulates how much loading of a pollutant that a water body can tolerate and maintain Water Quality Standards and considers all current and foreseeable sources of pollutant loading, which in this case includes the Reflecting Pool. Although the Tidal Basin has a designated use of primary contact recreation (i.e., swimming), and the Tidal Basin is currently used for paddleboat rentals, it cannot currently attain that use, due to its relatively shallow depth (6.5 feet, on average) that causes warmer waters, sluggish flow, and bacterial loading from direct discharges, direct deposits, and separate stormwater discharges. The combination of these factors has caused fecal coliform counts that exceed the water quality standard of a monthly geometric mean of 100 MPU<sup>5</sup>/100mL.

The Reflecting Pool is currently drained and cleaned once or twice annually during the cooler months, discharging approximately 6.5 million gallons of water into the Tidal Basin over several days (ABE 1987).

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<sup>4</sup> Impairment described in this paragraph refers to water quality impairment defined in the Clean Water Act, and not impairment defined by the National Park Service's *2006 Management Policies* (NPS 2006), which requires an analysis of potential effects to determine whether actions would impact or impair Park resources.

<sup>5</sup> MPU stands for Most Probable Unit number of bacterial colonies.

The Reflecting Pool accumulates organic matter, including leaf litter, and waste from waterfowl that could exacerbate an existing water quality problem in the Tidal Basin if it is drained during the summer months when the water in the Reflecting Pool is easily warmed and bacteria can thrive. Because the Reflecting Pool is drained for scheduled maintenance during months when the water temperature in the Reflecting Pool and Tidal Basin is cooler, however, the bacterial counts will be lower or negligible in the colder water. Drainage for emergency repairs or other unexpected events could occasionally occur in warmer months.

The no action alternative would have long-term adverse impacts to the water quality in the Tidal Basin that can be mitigated to minor adverse impacts by continuing to schedule the Reflecting Pool drainage and maintenance during winter.

### **CUMULATIVE IMPACTS**

All other projects considered in this study have little impact on water resources, when considered cumulatively. The water in the ceremonial pool of the World War II Memorial at the east end of the Reflecting Pool is treated more intensely than the Reflecting Pool water and discharges into the Tidal Basin under an NPDES permit. That World War II Memorial ceremonial pool is not sizeable, and like the Reflecting Pool, is drained and cleaned on a regular schedule, in addition to interim cleaning. With an NPDES permit in place, the World War II Memorial does not affect water quality of either the Tidal Basin or the Potomac River, and will not adversely affect implementation of the TMDLs for the Tidal Basin, other than to help ensure that the TMDL can be implemented (DC 2004b).

TMDLs have been developed for the Tidal Basin to bring the water quality into compliance with the standards for both fecal coliform and organic chemical compounds, such as Polychlorinated Biphenyl Compounds (PCBs), which are legacy chemicals and are typically bound into the soils in the river bed at various hotspots along the River. Organic compounds are not under consideration in this study, as there will be no discharge of organic compounds into the Tidal Basin from any NPS outfalls. The TMDL for bacterial impairment needs to be considered, however. However, the draining and maintenance schedules for both the Reflecting Pool and the World War II Memorial need to be considered in TMDL implementation planning, and vice versa. Continuing the drainage and maintenance schedule in the cooler months minimizes pollutant and thermal loadings in the Tidal Basin from NPS sources. No other projects that include discharge into either water body are currently planned by the NPS in the study area, so there would be no additional cumulative impacts on water resources from the NPS.

Other efforts will result in long-term beneficial effects to both the Potomac River and the Tidal Basin. Such efforts include implementing the LTCP to eliminate CSO discharges by constructing large underground storage facilities and implementing other related measures in the District, such as encouraging the use of green roofs and rain barrels in residences to minimize stormwater runoff within the CSO area as well as in areas served by separate storm sewers and subject to the Municipal Separate Storm Sewer (MS4) NPDES permit. These other programs could result in some degree of long-term benefits to the Tidal Basin and Potomac River, although there would be no impacts from these programs on the water quality in the Reflecting Pool itself, or in the World War II Memorial ceremonial pool.

There would be minor adverse cumulative effects on water resources as a result of implementing the no action alternative.

### **CONCLUSION**

Continuation of the current management and maintenance approaches to the elm walk and east plaza will constitute no impact to either water resources or water quality. Continuing current management practices in the Reflecting Pool constitutes a long-term minor adverse impact to water quality in the Tidal Basin. Continuation of the current management approach would also result in poorer than desired water quality in the Reflecting Pool in the summer months, since the water would be still, warm, and prone to algal blooms and higher bacteria counts, causing long-term minor adverse cumulative effects. The results of

other efforts in the area could result in some degree of long-term benefits to the Tidal Basin and Potomac River. There would be no impacts on the wastewater treatment plant, but long-term minor impacts on the drinking water utility would continue, which could be exacerbated in times of drought or when water conservation measures are necessary. Based on this impact analysis, the no action alternative would not result in impacts that would constitute an impairment to water resources, as defined by the NPS Management Policies (NPS 2006).

## Impacts of the Action Alternative

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

### ELM WALKS AND EAST PLAZA

The proposed actions at these locations would have no effect on water resources or on water quality. Water supply for drinking fountains and irrigation along the elm walks would be furnished from the municipal water supply and the drinking fountains would drain onsite; the drained water would be of relatively high quality and of negligible volume. No activities proposed in the Lincoln Memorial east plaza would involve water resources and therefore would have no effect on water resources or water quality. Appropriate sediment and erosion control measures would be used where there is any disturbed soil greater than 50 square feet during the construction process to protect adjacent waterways and storm sewers from sediment-laden runoff, as required under the CWA and the District's Sediment and Erosion Control Standards and Specifications (DC n.d.).

### REFLECTING POOL

All of the Reflecting Pool structural upgrade options (Options B1, B2, and B3) would result in a beneficial impact on water resources because the repairs of structural deficiencies would halt the current leakage of water from the Reflecting Pool. There would be no effect on water quality.

Options C1, C2, and C3 would have varying effects as described below:

*Option C1*—This option would use the Potomac River as a water source, and discharge continuously to the Tidal Basin, so there would be constant flow of water through the Reflecting Pool. The water would be filtered at the intake point to remove larger solids, suspended solids, and sediment. The Reflecting Pool would be emptied once every two years for in-depth cleaning and inspection.

The intake from the Potomac River would be west of Ohio Drive, and south of Memorial Bridge and the John Ericsson National Memorial, approximately four-tenths of a mile downstream of the nearest CSO outfall. To minimize risk from elevated bacterial levels in the Reflecting Pool, it is good practice to close the intakes during and after heavy storm events, as bacterial counts are highest then.

No additional water quality treatment is anticipated, and it is expected that maintaining a continuous flow of water through the Reflecting Pool will improve the overall quality of the Reflecting Pool water over the current configuration, since it will flush organic waste, and keep enough dissolved oxygen in the Reflecting Pool to increase inhibition of algal growth. The Reflecting Pool would also be cleaned in place with skimmers, as needed.

The constant flow through the Reflecting Pool would result in a complete daily turnover of the water in the Reflecting Pool, cycling approximately 6.5 million gallons a day from the Potomac River to the Tidal Basin. Although this is a relatively minor number when compared to the volume and flow in the Potomac River, the increased flow into the Tidal Basin could marginally increase dissolved oxygen in the basin. One potential adverse impact is the discharge of warmer water and organic waste from the Reflecting Pool into the basin during the hottest summer months, which could exacerbate existing water quality

conditions in the basin. The constant flow would minimize the loadings of organic waste by spreading them out over time, and would also help minimize warming in the Reflecting Pool; however, the Reflecting Pool has a large surface area in relationship to its relatively shallow depth, and warming in the Reflecting Pool in the hottest of months is likely. The NPS will be required to obtain an NPDES discharge permit for this alternative and would have to ensure that the quality of the discharged water is within several permitted parameters. To avoid thermal impacts, likely requirements of such parameters might include ensuring the temperature of the water discharged from the Reflecting Pool is not significantly warmer than the temperature in the receiving water. It is also possible that the District and the EPA would decide to regulate the Reflecting Pool as a Water of the District, subject to compliance with water quality standards.

In addition to the NPDES discharge permit, the NPS would also be required to obtain a Section 10 intake permit from the USACE to draw water from the Potomac River. Intake from the Potomac would not cause any long-term impact on the Potomac River. Construction of the intake infrastructure could result in exposed soils during the construction period, but use of directional drilling to place the pipe, and accepted sediment and erosion control measures around disturbed areas would result in short-term, negligible, adverse impacts on water resources, if any.

Implementation of this option would result in slight long-term beneficial impacts to water quality in the Reflecting Pool, as well as to the Tidal Basin by helping increase flow and flushing, assuming temperature can be designed to remain within designated parameters. There would be no impacts to the Potomac River at the intake point. All required permits would be obtained. There would also be no impacts on either the water or wastewater utilities, since neither will be used.

*Option C2*—In this option, the water continues to come from the municipal potable water, as it currently is, but the Reflecting Pool would now be discharged to the sanitary sewer to be treated at the Blue Plains Wastewater Treatment Plant. Because the water entering the Reflecting Pool is already finished drinking water, no filtration would be necessary. Ozone would be used to provide algae inhibition and disinfection. The Reflecting Pool would be divided into four treatment zones. The Reflecting Pool would be drained annually for cleaning and maintenance.

As this option uses the local water and wastewater utilities to supply water for and to drain the Reflecting Pool, there would be no water quality impacts to either the Tidal Basin or the Potomac River from intake or discharge activities. Construction of the new connection to the sanitary sewer system would disturb some soil, posing a minor risk of pollution from runoff during storm events while the pipes are being installed. The use of directional drilling techniques to place the new pipe, and use of appropriate sediment and erosion control measures in accordance with District regulations near any soil disturbances, would mitigate this risk and result in short-term negligible adverse effects.

Although this option would require neither an intake permit from the USACE nor an NPDES permit from the EPA, coordination would be required with DC WASA, to confirm that neither official permits, such as industrial pretreatment permits, nor permits for discharge to the sewer system and intake from the potable water system would be needed. The once-annual drainage of the Reflecting Pool, although a large number of gallons, represents a relatively small portion of the volume treated at the plant, especially if the Reflecting Pool is drawn down over several days. However, the water discharged to the sanitary sewers would still require treatment, and the use of potable water for the Reflecting Pool would continue to divert finished water to a project that does not need to use finished water, and therefore wastes resources at either end of the process, creating a negligible but long-term adverse effect on the drinking water and wastewater treatment utility for the area.

Water quality in the Reflecting Pool would not be appreciably improved over the current configuration. The transducers would reduce algal growth somewhat more effectively than the current practice of using a certified organic algacide, but water movement within the Reflecting Pool would be limited, and the

Reflecting Pool would continue to accumulate organic matter that would not be flushed out as with the other options. This accumulation of organic matter would likely cause an increase in water temperature, even higher in the summer months than with the options that include continuous flow. Subsequently, algae would be harder to manage. Residual bacteria levels during these months could also be higher than the other action options that contain a flow-through configuration, and which more effectively flush organic matter from the system. The impact to water quality in the Reflecting Pool with the Option C2 configuration would be similar to the water quality in the current configuration, with the transducers providing some improvement over the no action alternative. The effects on water quality in this option therefore provide a slight long-term benefit when compared to the no action alternative.

*Option C3*—In Option C3, the Tidal Basin would serve as the water source, with continuous flow through the Reflecting Pool, and discharge to the Potomac. As with Option C1, water would be filtered to remove larger solids, suspended solids, and sediment. Transducers could be used to inhibit algal growth if needed. A Section 10 intake permit from the USACE would not be required under this option, as the Tidal Basin is under the jurisdiction of the Department of the Interior, but an NPDES discharge permit from the EPA Region 3 in coordination with the District would be required. It is likely that the District and EPA would consider the Reflecting Pool to be a “Water of the District of Columbia,” and subject to water quality standards. The Reflecting Pool would be drained once every two years for cleaning and maintenance, the same as with Option C1.

There are similar considerations with this option as there are with Option C1, although the impacts differ. In this case, the water would be taken from the Tidal Basin, and discharged into the Potomac River upstream of the Tidal Basin. The Tidal Basin’s impairment for fecal coliform means it is more likely that the water introduced to the Reflecting Pool could exceed water quality standards for fecal coliform at certain times of year, an issue that could be exacerbated by the tendency for the shallow water in the Reflecting Pool to warm. Because the impairment is a more general condition, and not caused by specific events such as a CSO, it is harder to mitigate for. However, it is still good practice to close the intakes during and after heavy storm events, as bacterial counts are highest then. As with Option C1, the flushing provided by the continuous flow would help prevent and flush algae, and would keep moving organic waste through the system, although the baseline water quality on any given day could be poorer than if Potomac River water was used. Baseline water quality could be similar to water from the municipal source that is not flushed through the Reflecting Pool on a regular basis, as is the case with the current Reflecting Pool configuration and with Option C2.

Temperature is also a consideration. As with Option C1, the constant flow through the Reflecting Pool will prevent the temperatures from building as much as with Option C2 during the summer months. As with discharge into the Tidal Basin, water discharged into the Potomac River from the Reflecting Pool may not vary significantly in temperature from the receiving waters in order to prevent thermal pollution. It is more likely that discharging water into the Tidal Basin from the Reflecting Pool would be within those limits as opposed to discharging water into the Potomac River, although the assimilative capacity of the river is far greater. In addition, the water in the Tidal Basin tends to be warmer than that of the Potomac River during summer, and the water entering the Reflecting Pool would therefore start at a warmer temperature than water coming from the river.

Effects on water quality in the Reflecting Pool range from long-term minor adverse to long-term negligible beneficial, depending on the season and pollutant loads in the Tidal Basin. Impacts to the receiving water would be long-term negligible adverse to long-term negligible beneficial, as NPDES permits would require that water discharged into the Potomac be within acceptable parameters, although it would be somewhat harder to meet those parameters under this option than with Option C1. There would also be no impacts on either the water or wastewater utilities, since neither will be used.

## Water Resources Permitting Requirements and Processes

Intake and discharge permits serve as part of the mitigation measures for all the options to ensure that any adverse impacts of the project are minimized, and are negligible to minor for the long-term. Both Options C1 and C3 have similar permitting requirements. As mandated by the CWA, both options would require NPDES discharge permits from EPA Region III, which acts for the District of Columbia; the District of Columbia would likely determine that the Reflecting Pool is a “Water of the District of Columbia” (both options use Waters of the District to fill the Reflecting Pool, then return it to an adjacent water body). As such, the Reflecting Pool would be subject to compliance with water quality standards. The no action alternative would also likely require an NPDES permit in the future, even though discharge has been grandfathered thus far, placing the existing outfall into noncompliance with regulations. It is less likely that the Reflecting Pool would be designated a Water of the District for the no action alternative, but the NPS would still have to ensure compliance with the NPDES permit. NPDES permits place limits on a range of water quality parameters, such as nutrients, bacteria, temperature, and toxics, and require dischargers to ensure that the quality of discharged water remains within these parameters, and that the receiving water can continue to meet water quality standards. Monitoring would be required.

Option C1 would require an intake permit from the USACE under Section 10 of the *Rivers and Harbors Act of 1899*. Because the Tidal Basin floor is under the jurisdiction of the Department of the Interior, Option C3 would not require a Section 10 permit. The Section 10 permit can be obtained from the USACE through a coordinated permit process that involves the District of Columbia.

Option C2 would require coordination with, and permission from, DC WASA to discharge to the sanitary sewer system. A formal permit would not be required. The permitting chain for both sets of options is illustrated in Figure 4.3.

### CUMULATIVE IMPACTS

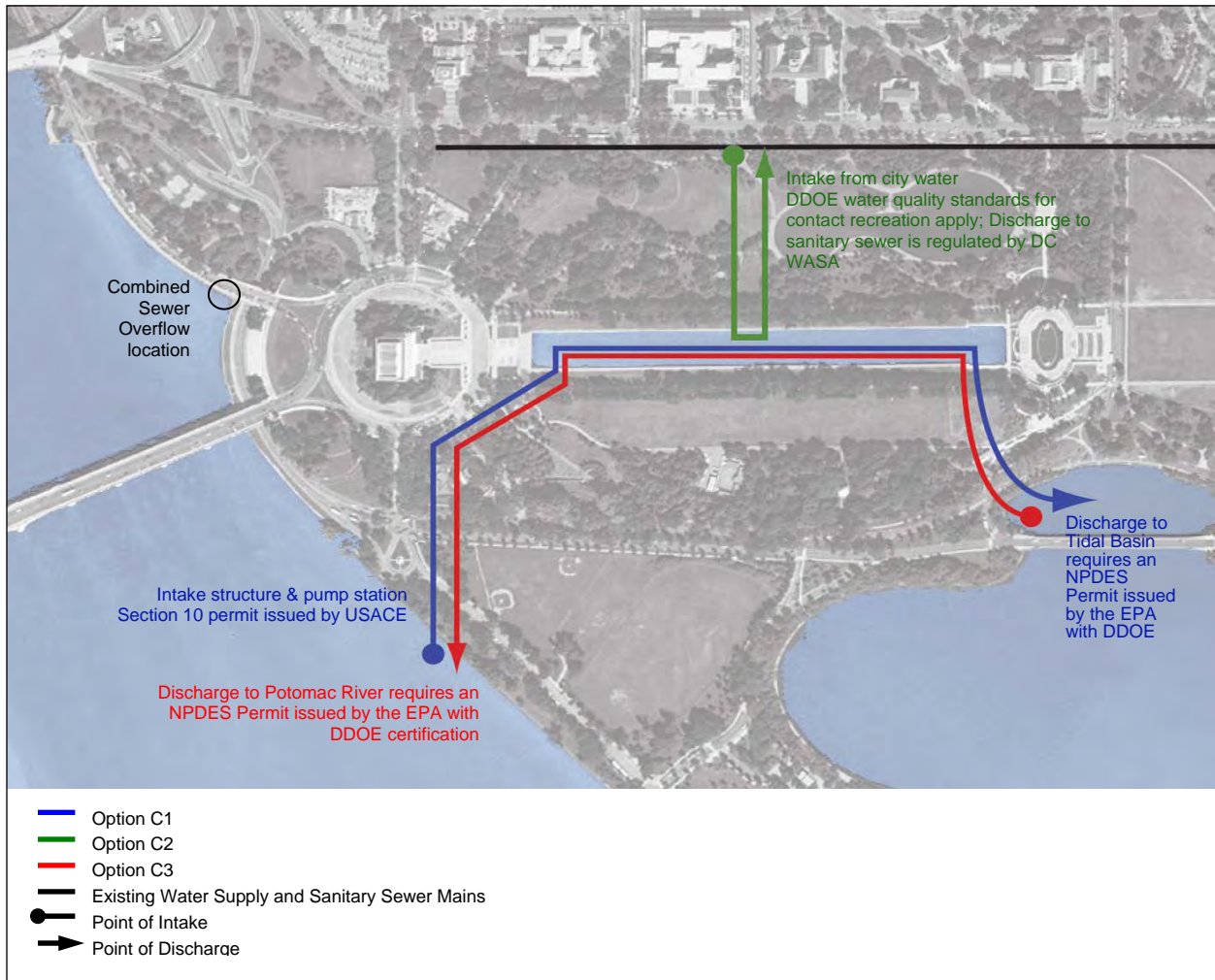
Impacts from other projects and activities in the area that could affect water quality in the study area would be the same as described for the no action alternative. Specifically, the implementation of the DC WASA’s LTCP to control CSOs in the District, as well as implementation of various stormwater management programs, would have long-term beneficial impacts on water quality in the Potomac River, and ultimately the Tidal Basin. Under the action alternative, the long-term net impact of all options on water quality is a long-term benefit, when considered with other water quality improvement activities. Other ongoing projects in the study area, such as the USIP and the NMAAH, will access water and sewer services, but the adverse impact on the utilities would be negligible, in context with other development in the region.

### CONCLUSION

None of the proposed actions along the elm walks or at the Lincoln Memorial east plaza would affect water quality. All the Reflecting Pool structural upgrade options would result in a beneficial impact on water resources because the repairs would halt the current leakage of water from the Reflecting Pool. The reconfigurations to the water supply sources and receiving waters, as well as different strategies to address water quality within the Reflecting Pool, would have varying affects on water resources and water quality within the Reflecting Pool and in the proposed receiving waters. Option C1 would result in long-term minor improvements in water quality in the Reflecting Pool, and Option C3 would result in long-term negligible effects, ranging from adverse to beneficial effects on water quality in the Reflecting Pool. The difference between the two options is due to the different water sources proposed. Option C2 would result in long-term negligible improvements to water quality in the Reflecting Pool, as a new algal treatment is proposed that also includes some disinfection properties, but the treatment and flow in the Reflecting Pool would otherwise remain the same. Although there is a risk of problems with bacteria and thermal loads from the Tidal Basin in Option C3, it is likely that the water quality in the Reflecting Pool would be marginally better than water quality in Option C2, given the flow-through scenario. Options C1

and C3 would have long-term negligible beneficial impacts to the water quality of the Tidal Basin and Potomac River, respectively, assuming that NPDES permit requirements, discussed earlier in this chapter, can be met. All three options would cause short-term negligible adverse effects during construction, mitigated with the use of sediment and erosion control measures to prevent sediment runoff into adjacent water bodies or nearby storm sewers. There would be no impact on the water or wastewater utility. Option C2 would have no effect on water quality in receiving waters, as the Reflecting Pool will be directed through the wastewater treatment plant. It will, however, place a long-term, negligible adverse impact on the treatment plant. Based on this impact analysis, none of the options in the action alternative would constitute an impairment to water resources.

Figure 4.3 –Water Resources Permitting Diagram





## Soils

### METHODOLOGY AND ASSUMPTIONS

For soil resources, potential impacts were assessed based on limitations associated with the soils and the extent of possible disturbance. Impact analysis and the conclusions for possible impacts to the resources were based on a geotechnical analysis of the project area, review of existing literature and soil and topography maps, and information provided by the NPS and other agencies. This section assesses the potential effects of the improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

### STUDY AREA

The geographic study area for impacts to soil resources is the area within the boundary of each proposed site and any area required for construction staging. It is expected that construction activities would not occur outside this area. The National Mall is the study area for the cumulative impacts analysis for soils.

### IMPACT THRESHOLDS

The following thresholds were used to determine the magnitude of impacts soil resources:

*Negligible*—The action would result in a change to a soil resource, but the change would be so small it would not be of any measurable or perceptible consequence.

*Minor*—The action would result in impacts to a soil resource, but the change would be small and localized and of little consequence. Mitigation would be needed to offset adverse impacts and would be relatively simple to implement and would likely be successful.

*Moderate*—The action could result in a change to soil resources; the change would be measurable and of consequence. Mitigation measures would be necessary to offset adverse impacts and would likely be successful.

*Major*—The action would result in a noticeable change to soil resources; the change would be measurable and result in a severely adverse impact. Mitigation measures necessary to offset adverse impacts would be needed, extensive, and their success would not be guaranteed.

*Duration*—Short-term impact to soils would occur during the construction activities. Long-term impacts to soils would extend after completion of the project.

## Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and the Lincoln Memorial east plaza.

### ELM WALKS, EAST PLAZA, AND REFLECTING POOL

The existing social trails along the elm walks and Reflecting Pool would continue to be enjoyed by visitors; their continued use would further compact the soils and stunt vegetative ground cover, further exposing portions of the project area to the effects of wind and stormwater erosion. As a result, the continued erosion and compaction of the social trails would impact soils in the project area, but in a small scale and localized way, resulting in long-term minor adverse impacts. The continuation of the current operation and maintenance of the east plaza, lower approachway, and Reflecting Pool would have no measurable effect on soils.

## **CUMULATIVE IMPACTS**

Projects that could affect soils include ongoing special events on the National Mall as well as previous development that involved construction and fill within or around the project area. Special events, such as the 2009 Presidential Inauguration, bring a higher number of visitors to the area who use all portions of the project area, including turf areas that are not hardscaped or paved. This higher visitor presence further compacts soils in the project area, creating both short- and long-term minor adverse impacts.

Past or ongoing projects include the Potomac Park levee construction, the construction of the Franklin Delano Roosevelt Memorial, and the World War II Memorial, which removed soil from the study area. However, all these projects had a negligible effect on the resources immediately around the Reflecting Pool. Therefore, these projects would not contribute cumulatively to the impacts of the no action alternative. The resultant cumulative impacts resulting from the no action alternative are long-term adverse and minor.

## **CONCLUSION**

Implementation of the no action alternative would result in long-term minor adverse impacts to soil resources due to continued compaction of soils from visitor use and erosion of exposed soils during weather events. Cumulative impacts to soil resources resulting from special events and adjacent construction activity would be both short- and long-term, adverse and minor in degree.

## **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

### **ELM WALKS**

There would be short-term, minor adverse effects to soils during construction due to the presence of equipment and the trenching of the soil to install new water supply lines and irrigation valves. As a result of these construction activities, soils would be compacted, soil structure would be modified, and soils would be exposed, increasing the potential for erosion. During construction, exposed soils would be covered with plastic sheeting, jute matting, erosion netting, straw, or other suitable cover material so as to prevent soil erosions and movement during rain or wind events. Silt fencing will also be used to prevent soil from leaving the project area. However, after construction is complete, long-term beneficial impacts would result from the resurfaced elm walks and reconfigured site furnishings, which would discourage the formation of new social trails.

### **EAST PLAZA**

Creation of accessible pathways between the east plaza and the lower approachway terrace and the installation of a conduit to the Vietnams Veterans and Korean War Veterans kiosks would result in short-term minor adverse impacts to soils as a result of ground disturbance during construction. Re-alignment of the Potomac Park Levee would have similar effects on soils as there would be short-term impacts associated with moving the berm. Implementation of Option A1, A2, or A3 would result in short-term minor adverse impacts to soils due to construction disturbance and the use of heavy equipment. Following construction, there would be long-term negligible adverse impacts to soils, resulting from the permanent loss of soil productivity in those areas that would be paved, such as the soils under the proposed pathways and security walls. However, the new curved walkways would provide a formal pathway for visitors to transition between the elm walks, lower approachway, and east plaza so the opportunity for the formation of new social paths would be greatly reduced, resulting in a long-term beneficial impact to soils.

**REFLECTING POOL**

The surfacing of the existing worn dirt paths that flank the Reflecting Pool would have no effect because the soils that would be paved are already in a compacted state. Therefore, there would be no measurable change in soil productivity in the area of the worn pathways. There would be short-term, minor adverse impacts to soils from ground disturbance during construction of the walkways. However, there would be long-term beneficial impacts to soils in and around the dirt paths as erosion would be minimized once the dirt paths are covered.

Various actions are proposed to improve the functionality of certain aspects of the Reflecting Pool, such as the structural system, water supply, volume, and drainage. These actions would all result in short-term minor adverse impacts to soils during construction due to the presence of heavy equipment and ground disturbance.

All options for improving the water system would require the installation of a new lateral pipe to connect the water source to the Reflecting Pool and/or to connect the Reflecting Pool to the discharge outflow. The installation of this water line would result in short-term, minor, adverse impacts to soils from disturbance during construction activities. Standard erosion and sediment control methods would prevent any long-term impacts from occurring. Exposed soils will be stabilized and replanted with vegetation as soon as possible following completion of construction activities.

Options C1 and C3 would require the construction of a 15 foot by 15 foot pump station and subsurface electrical vault. Option C2 would require the construction of several 10 foot by 12 foot subsurface concrete vaults. The installation of these structures would result in the loss of soil productivity in the area of the structural footprint which would create a small and localized effect on soils, resulting in short-term minor adverse impacts to soils during construction and long-term minor adverse impacts following construction. There would be greater impacts to soils resulting from the installation of structures in Option C2 than the impacts from the other options because of the number, size, and subsurface nature of the structures in Option C2.

In summary, there would be measurable short-term adverse impacts to soils from construction activities and long-term adverse impacts to soils due to loss of productivity from building. However, soils in the project area are mostly comprised of fill material, which is low in organic matter and not generally biologically productive. Beneficial impacts to soils would result from paving the existing compacted and eroded dirt paths, which would reduce erosion over the long term and reduce the long-term adverse soils impacts from negligible to minor in degree. There would be no impairment to soils as a result of implementing any option of the action alternative.

**CUMULATIVE IMPACTS**

Projects and special events that could affect soils under the action alternative are the same as described in the no action alternative. Cumulative impacts to soils resulting from these actions would be short-term adverse and minor, but the net long-term cumulative impacts, including impacts of the project, would be beneficial.

**CONCLUSION**

Implementation of action alternative would result in short-term minor impacts to soils due to temporary disturbance from construction activities. Long-term, negligible adverse impacts to soil resources would occur due to permanent loss of soil productivity under the footprints of proposed structures associated with the rehabilitation of the Reflecting Pool and surrounding area. However, soils in the project area are mostly comprised of fill material, which is low in organic matter and is not generally biologically productive. Beneficial impacts to soils would result from paving the existing compacted and eroded dirt paths, which would reduce erosion over the long term. Cumulative impacts to soils resulting from these

actions would be short-term adverse and minor, but the net long-term cumulative impacts, including impacts of the project, would be beneficial. There would be no impairment to soils as a result of implementing any option of the action alternative.

## Vegetation

### METHODOLOGY AND ASSUMPTIONS

Available information on the vegetation, especially mature trees and landscape, was compiled and reviewed. Impacts on vegetation were based on general characteristics of the site and vicinity, available aerial photos, site observations, proposed encroachment into vegetated areas associated with construction, and removal of vegetation.

### STUDY AREA

The study area for vegetation includes the Reflecting Pool and surrounding area and portions of West Potomac Park, south of Independence Avenue SW.

### IMPACT THRESHOLDS

The following thresholds were used to determine the magnitude of impacts on vegetation:

*Negligible*—Very few individual trees, mature landscape plantings, or turf would be affected.

*Minor*—A few individual trees and mature landscape plantings, or a small amount of turf would be affected; however, mitigation measures such as replanting to avoid or offset impacts on trees could be implemented which would be effective in replacing or reducing losses of vegetation in a short time.

*Moderate*—A relatively large number of individual trees, mature landscape plantings, or turf would be affected. Mitigation measures such as replanting to avoid or offset impacts on trees and other landscaping of greater concern could be implemented and would be effective in replacing or reducing losses of vegetation, but extended time may be needed for the regeneration of lost mature vegetation.

*Major*—A substantial volume of individual trees, mature landscape plantings, and turf would be affected, and numerous older mature trees would also be impacted, either directly or indirectly. Actions would substantially change the vegetation over a large area in the study area. Extensive mitigation would be needed to offset adverse impacts, and its success would not be assured.

*Duration*—Short-term impacts last less than one year; long-term impacts last longer than one year.

## Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, the Lincoln Memorial east plaza, and portions of West Potomac Park.

### ELM WALKS AND REFLECTING POOL

The continuation of current use and maintenance of the site furnishings would have no effect on the mature elm trees along the walkways. The existing social trails along the elm walks and Reflecting Pool would continue to be enjoyed by visitors; their continued use would further compact the soils and stunt vegetative ground cover. As a result, there would be long-term minor adverse impacts due to soils erosion and deterioration of turf. The recreational fields to the south of the southern elm walk and in West Potomac Park would continue to be enjoyed by visitors; their continued use would cause further soil erosion, soil

compaction, and deterioration of turf, creating a noticeable but localized impact to soils in the project area, which would result in long-term minor adverse impacts to soils.

#### **LINCOLN MEMORIAL EAST PLAZA**

Since this area is primarily hardscape and current operations do not affect the mature trees in the area, there would be no effect on vegetation.

#### **CUMULATIVE IMPACTS**

Activities or projects in the study area that have or could affect vegetation include ongoing landscape and maintenance, visitor use, and several planned projects that would directly affect the study area. Ongoing landscape activities would likely result in long-term beneficial impacts because vegetation would continue to be established and maintained. Future projects within the project area that could affect vegetation include construction of other structures on the National Mall, including the NMAAHC, USIP, MLK Memorial, and the Potomac Park Levee project. These projects would contribute cumulatively to impacts on vegetation in the study area, potentially resulting in long-term minor adverse cumulative impacts on vegetation. However, each project would be subject to mitigation requirements which would result in an overall increase in the number of trees in the study area. Therefore, long-term impacts on vegetation associated with construction activities within the study area would be short-term and minor in degree.

#### **CONCLUSION**

The implementation of the no action alternative would result in long-term adverse impacts to turf in the project area, but no woody vegetation would be impacted. Therefore, impacts to vegetation under this alternative would be long-term, negligible, and adverse. Cumulative impacts to vegetation would be long-term minor adverse.

#### **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

#### **ELM WALKS**

The reconfiguration of the site furnishings and installation of the new permanent lighting fixtures, irrigation valves, and drinking fountains would have no effect on the mature elms that line the pathways. There would be short-term, minor adverse effects to the turf due to the presence of construction equipment and the trenching of the site to install new water supply lines and irrigation valves. However, implementation of the action alternative along the elm walks would result in a long-term beneficial impact because the formation of new social trails would be greatly reduced, allowing the vegetation to thrive. In addition, the irrigation valves would accommodate site watering and landscape maintenance.

#### **LINCOLN MEMORIAL EAST PLAZA**

There would be short-term minor adverse impacts to vegetation during the installation of a conduit to the Vietnams Veterans and Korean War Veterans kiosks as a result of ground disturbance from trenching and heavy equipment use. Re-alignment of the Potomac Park Levee would have similar effects on vegetation, as there would be short-term impacts associated with moving the berm.

Implementation of Option A1, A2, of A3 would have the same measurable effects; there would be short-term minor adverse effects to vegetation due to the presence of heavy equipment and the disruption to the topography to install new accessible pathways, vehicular security walls, and bollards. In addition, the implementation of Option A1, A2, or A3 would affect several trees in the project area.

Trees removed to accommodate the implementation of proposed actions along the elm walks and east plaza<sup>6</sup> would be relocated, where appropriate, within the project area. One young American elm would be relocated to a historic position near the Lincoln Memorial Circle, and to the maximum extent possible, the gaps in the historically significant concentric rows of elms around Lincoln Memorial Circle would be filled. In addition, several understory trees would be relocated from the area near the Korean War Veterans information kiosk. Figure 4.4 delineates the resultant impacts on trees in the project area.

Figure 4.4 – Location of Affected Trees in Options A1, A2, and A3



To accommodate the realignment of the Potomac Park levee berm (described in Chapter 2), up to 26 additional trees would be removed in the project area. The loss of trees would result in a long-term moderate adverse impact since a relatively large number of individual trees would be affected. Mitigation measures such as replanting and restoring the double ring of concentric elms around the Lincoln Memorial Circle would offset impacts.

### REFLECTING POOL

Various actions are proposed to improve the functionality of certain aspects of the Reflecting Pool, such as the structural system, water supply, volume, and drainage. These actions would all involve short-term minor adverse impacts to vegetation during construction due to the presence of equipment and disruption of turf.

All options for improving the water system would require the installation of a 16-inch lateral pipe to connect the water source to the Reflecting Pool and/or to connect the Reflecting Pool to the discharge outflow. Option C1 would require the installation of a subsurface water supply line from the Potomac

<sup>6</sup> Four Dutch elms (ranging from five inch dbh to 11 inch dbh) along the elm walks and one young American elm (four inch dbh) in the adjacent area would be removed from the elm walks to accommodate new paths and security.

River to the southwest corner of the Reflecting Pool. Option C2 would involve the installation of a new pipe from the Reflecting Pool north through Constitution Gardens to the municipal sanitary sewer line. Option C3 would involve a new subsurface line in the same location as option C1, although it would function as a discharge outflow at the Potomac River instead of a water supply intake. All of the options would involve crossing either the north or south elm walk, which could potentially impact the existing trees. The depth of the line at 15 feet would likely avoid the root structure of the trees and damage to the root structure would be minimized through consultation with an arborist. No trees would need to be removed in West Potomac Park under any of the proposed options.

Options C1 and C3 would require the construction of a 15 foot by 15 foot pump station and subsurface electrical vault. Option C2 would require the construction of several 10 foot by 12 foot subsurface concrete vaults. These structures would be located to avoid damage or removal of mature vegetation. However, long-term minor adverse impacts to existing turf or shrubs would be expected to occur within the construction footprint.

Overall, the implementation of the action alternative would involve the overall loss of two mature trees and damage to turf in the project area. Although mature trees would be lost, this alternative involves mitigation planting and the opportunity to re-establish the rows of elm trees around Lincoln Memorial Circle. Therefore, impacts to vegetation would be long-term minor adverse under the action alternative.

There would be no impairment to vegetation as a result of implementing any option of the action alternative.

#### **CUMULATIVE IMPACTS**

The same activities or projects would contribute to cumulative impacts as described previously for the no action alternative. Ongoing landscape activities would likely result in long-term beneficial impacts because vegetation would continue to be established and maintained. Future projects within the project area would contribute cumulatively to impacts on vegetation in the study area, potentially resulting in long-term minor adverse cumulative impacts on vegetation. However, each project would be subject to mitigation requirements, resulting in an overall increase in the number of trees in the study area. Therefore, any long-term impacts associated with construction activities within the study area would be minor in degree. The impacts of these actions on vegetation would be long-term minor adverse. The impacts of all these actions, in combination with the long-term minor adverse impacts on vegetation from the proposed action would result in long-term minor adverse cumulative impacts on vegetation.

#### **CONCLUSION**

The implementation of the action alternative would involve the loss of two mature trees and damage to turf in the project area. Mitigation plantings and the establishment of the rows of elm trees around Lincoln Memorial Circle would reduce the adverse impacts to vegetation as the newly planted trees mature over time. Therefore, impacts to vegetation would be long-term minor adverse under the action alternative. Cumulative impacts to vegetation would be long-term minor adverse. There would be no impairment to vegetation as a result of implementing any option of the action alternative.



## Floodplains

### METHODOLOGY AND ASSUMPTIONS

Floodplains are defined by the NPS Floodplain Management Guideline (NPS 1993) as “the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, and including, at a minimum, that area subject to temporary inundation by a regulatory flood.” *Executive Order 11988: “Floodplain Management”* requires an examination of impacts on floodplains and of the potential risk involved in placing facilities within floodplains as well as the protection of floodplain values. A Statement of Findings for Floodplains was completed for this project and can be found in Appendix B of this EA. The NPS has adopted the policy of preserving floodplain values and minimizing potentially hazardous conditions associated with flooding (NPS Floodplain Management Guideline July 1, 1993).

The proposed actions would be implemented within an existing regulatory floodplain. As such, impacts on floodplain functions and values were assessed. These assessments were based on the known and potential 100-year floodplains within the study area, review of existing literature and studies, information provided by experts in the NPS and other agencies, and professional judgment.

### STUDY AREA

The geographic study area for floodplain resources is the 100-year and 500-year floodplain as mapped in the area of the proposed activities. Construction activities would not occur outside the study area.

### IMPACT THRESHOLDS

The thresholds of change for the intensity of an impact on floodplains are as follows:

*Negligible:* Impacts would result in a change to floodplain functions and values, but the change would be so slight that it would not be of any measurable or perceptible consequence.

*Minor:* Impacts would result in a detectable change to floodplain functions and values, but the expected change would be small, of little consequence, and localized. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

*Moderate:* Impacts would result in a change to floodplain functions and values that would be readily detectable, measurable, and consequential, but relatively localized. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

*Major:* Impacts would result in a change to floodplain functions and values that would have substantial consequences on a regional scale. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

*Duration:* Short-term impacts would occur sporadically throughout the course of a year. Long-term impacts would last more than one year.

### Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and the Lincoln Memorial east plaza. Under this alternative there would be no disturbance to any floodplains; therefore, no impacts would occur to any floodplains that currently exist within the project area.

## **CUMULATIVE IMPACTS**

Because the no action alternative would result in no beneficial or adverse impacts to floodplains, there would be no cumulative impacts as a result of the no action alternative.

## **CONCLUSION**

Implementation of the no action alternative would result in no long- or short-term adverse or beneficial or cumulative impacts to the currently existing floodplains found within the study area. The no action alternative would not result in impairment to floodplains.

## **Impacts of the Action Alternative**

The action alternative proposes multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations in the project area.

Proposed activities associated with the action alternative would be located within the designated floodplains as described in Chapter 3 and would change floodplain functions and values because of the addition of new equipment, small structures, and infrastructure to the project area. However, these changes would be slight and would create an effect that is not likely to be noticeable. The changes would not substantially affect flood water flows within the area in a measurable or noticeable way. The existing floodplain designations would remain unchanged. As a result, negligible impacts on floodplains would occur as a result of implementing any option of the action alternative.

## **CUMULATIVE IMPACTS**

Projects in the project area that could have effects on floodplain functions or values have involved previous development, including construction and fill, within the floodplain. These past projects have involved road improvements, levee construction, and the construction of the Franklin Delano Roosevelt Memorial. The World War II Memorial removed soil from the floodplain, but it had no effect.

The ongoing maintenance of these memorials, in combination with anticipated future actions (the MLK Memorial and VVMC) would occur adjacent to the project area. The MLK Memorial EA states that the proposed memorial would not adversely impact the floodplain. Due to the lowering of the plaza from the existing level, there would be a negligible net gain in flood storage area (NPS 2005). In addition, the VVMC is not in the current or proposed 100-year floodplain. Therefore, effects on floodplain functions or values in the area of analysis from either the proposed action or from these anticipated future cumulative projects in the vicinity are not anticipated to result in any measurable or perceptible change to floodplain functions and values.

The Potomac Park Levee would result in short-term negligible adverse impacts on the currently existing floodplains found within the study area based on FEMA data. Therefore, these impacts, in combination with the negligible impacts on floodplains under the action alternative, would result in short-term negligible adverse cumulative impacts on floodplain functions or values.

## **CONCLUSION**

Implementation of the action alternative would result in no long- or short-term impacts to the currently existing floodplains found within the study area, but would result in short-term negligible adverse cumulative impacts on floodplain functions or values. The action alternative would not result in impairment to floodplains. There would be no impairment to floodplains as a result of implementing any option of the action alternative.

## Traffic and Transportation

### METHODOLOGY AND ASSUMPTIONS

The primary purpose of this environmental consequences analysis is to determine the potential traffic and transportation impacts of the action alternative, with a focus on impacts resulting from occasional and short-term road closures, or restrictions during closures, and possible improvements needed to mitigate any identified impacts. Sources of information for this environmental consequences description include analysis of current traffic in the study area based on the DDOT ADT reports and extrapolation of current traffic patterns to the proposed construction scenario. The proposed plan is to limit temporary road closures to off-peak hours for no more than one week to accommodate the subsurface installation of new project features.

### STUDY AREA

The study area for traffic impacts includes adjacent roadways to the project area, including Constitution Avenue NW, Independence Avenue SW, 17th Street, 23rd Street, and Ohio Drive SW.

### IMPACT THRESHOLDS

The following thresholds were used to determine the magnitude of impacts on traffic.

*Negligible:* The impact would be a change that would not be perceptible or would be barely perceptible by transportation system users.

*Minor:* The impact would cause a change to travel times or transportation system utility. The impact would be noticeable but would result in little inconvenience to transportation system users.

*Moderate:* The impact would result in a change to the travel time or system utility of a large number of transportation system users and would result in a noticeable change in travel time or convenience. A moderate increase in delay may be anticipated, but it is not expected to cause failure of nearby facilities that cannot be mitigated through proactive management.

*Major:* There would be a substantial impact on the travel time or system utility of a large number of transportation system users, and this would result in a highly noticeable change in travel times or convenience, leading to failure or near-failure of nearby facilities, with little or no potential for mitigation.

*Duration:* Short-term impacts would be immediate during construction of the alternative; long-term impacts would be those persisting or resulting after construction of the alternative.

### Impacts of the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the Reflecting Pool and surrounding structures, elm walks, and the Lincoln Memorial east plaza. Under this alternative there would be no disturbance to any adjacent roadways and no impacts to traffic or transportation would occur within the project area.

### CUMULATIVE IMPACTS

Because there would be no impacts to traffic or transportation under the no action alternative, no cumulative impacts would occur.

### CONCLUSION

Implementation of the no action alternative would result in no long- or short-term adverse or beneficial or cumulative impacts to the roadways found within the study area.

## Impacts of the Action Alternative

For the purpose of this topic and analysis, the proposed actions along the elm walks and at the Lincoln Memorial east plaza would have no effects on the transportation network both during and following construction. Therefore, only the action alternative options for the Reflecting Pool structural system and water system are analyzed within this resource topic. The main impacts on traffic and transportation for these options are associated with construction activity. Trucks are not permitted across the Memorial Bridge, so construction equipment would need to access the construction staging area (described in Chapter 2) via I-395, 14th Street, and Independence Avenue SW.

### REFLECTING POOL STRUCTURAL SYSTEM

Once completed, Options B1, B2, and B3 would have no effect on traffic and transportation since they will not affect the adjacent roadways in the project area. There would, however, be varying degrees of adverse impacts due to construction, depending on which option is implemented.

*Option B1*—This option would entail a partial reconstruction of the foundation slab, grade beam, joint system, and granite coping and would require approximately nine months to complete. During this time, there would be short-term minor adverse impacts to transportation since the roadways would be burdened with construction equipment coming into and leaving the project area and the construction staging area. The level of activity introduced to adjacent roadways would be minor in effect and would be minimized by restricting substantial construction equipment activity on roadways to off-peak hours.

*Options B2 and B3*—These options would entail a full reconstruction of the foundation slab, grade beam, joint system, and granite coping and would require approximately 18 months to complete. During construction, there would be minor to moderate adverse impacts to transportation depending on traffic volumes at certain times of the day since the roadways would be burdened with construction equipment coming into and leaving the project area and the construction staging area. The intensity of construction equipment would be more substantial than that of Option B1 because the existing structural system would be demolished and hauled offsite and a new structural system would require thousands of cubic yards of concrete to be brought into the site. There would be short-term minor adverse impacts resulting from the presence of construction equipment, provided the equipment activity on adjacent roads was limited to off-peak hours.

### REFLECTING POOL WATER SYSTEM

Once completed, Options C1, C2, and C3 would have no effect on traffic and transportation since they will not affect the adjacent roadways in the project area. There would, however, be varying degrees of adverse impacts due to construction, depending on which option is implemented.

*Option C1*—In this option, a new subsurface water supply line would be required to accommodate the new Potomac River water source for the Reflecting Pool. The new intake point would be located on the banks of the Potomac River adjacent to the Franklin Delano Roosevelt Memorial Bridge. From there, a new supply line would need to be installed beneath Ohio Drive SW and Daniel French Drive SW. The existing method of discharge to the Tidal Basin would be used.

The installation of a new supply line to the Reflecting Pool from West Potomac Park would require the partial closure of Independence Avenue SW. The closure would maintain continuous flow of eastbound and westbound traffic with fewer lanes and would be limited to off-peak hours (10pm to 5am). After 5am, metal plates would be placed over the roadway to allow for continuous access during peak hours. The duration of partial closure would be limited to one week. These closures are subject to Traffic Control Plans to be worked out with the FHWA and approved by the NPS prior to obtaining a construction permit.

Since the partial closure would occur during off-peak hours, there would be negligible impacts to commuters, tourists, and tour buses, but an overall short-term minor adverse effect since it would

create a noticeable change in traffic patterns along Ohio Drive. The timing and duration of the activity would result in little inconvenience to transportation system users.

*Option C2*—In this option, the existing water supply infrastructure would be used, but a new subsurface discharge line would be installed beneath Constitution Gardens to connect to the main sanitary sewer main that runs along Constitution Avenue NW. The proposed subsurface construction would have no effect on adjacent roadways and therefore would have no effect on transportation resources in the project area.

*Option C3*—In this option, two new subsurface pipes would be required to accommodate the new water supply line from the Tidal Basin and the new method of discharge to the Potomac River. The new intake point would be located west of the Tidal Basin and south of Independence Avenue. The exact location would be determined in the design process.

The installation of the new supply and discharge lines would require the partial closures of limited portions of Independence Avenue SW. These would not be partially closed concurrently. Each closure would maintain continuous flow of eastbound and westbound traffic with fewer lanes and would be limited to off-peak hours (10pm to 5am). After 5am, metal plates would be placed over the roadway to allow for continuous access during peak hours. The duration of partial closure would be limited to one week. These closures are subject to Traffic Control Plans to be worked out with the FHWA and approved by the NPS prior to obtaining a construction permit.

Since the partial closure would occur during off-peak hours, there would be negligible impacts to commuters, tourists, and tour buses but an overall impact that would be a short-term minor adverse effect since it would create a noticeable change in traffic patterns along Ohio Drive. The timing and duration of the activity would result in little inconvenience to transportation system users.

#### **CUMULATIVE IMPACTS**

Cumulative actions in the project area that could affect traffic include ongoing background traffic growth plus several future plans and projects that would directly affect the Mall. Future projects within the project area that could affect traffic include construction of other buildings on and near the National Mall (NMAAHC, VVMC, USIP, Jefferson seawall, DCWM, MLK Memorial) and the improvements along Constitution Avenue. These projects would contribute cumulatively to impacts on traffic in the study area. However, each project would be subject to specific requirements to reduce the individual impact on traffic. Of all these projects, the MLK Memorial, DCWM, and Jefferson seawall are anticipated to take place during the construction of proposed actions to the Reflecting Pool, and these would contribute minor short-term adverse cumulative impacts during construction.

The number of visitors to the National Mall typically remains constant; however, their travel and circulation patterns vary in response to new projects and points of interest. Any increase in visitation that might be expected to occur from the new attractions on the National Mall, continued development, or new employment opportunities in the District could result in increased traffic. Adverse impacts within the study area from these projects would be minor and long-term. Conversely, rising fuel costs and continued or increased use of public transportation would result in decreased car traffic, with beneficial impacts on traffic in this area.

Construction activity from the MLK Memorial, which would affect portions of Independence Drive SW, would affect traffic in the study area. When combined with the short-term negligible to minor adverse impacts of Options B and C, there would be a net long-term minor adverse impact on traffic in this area.

## **CONCLUSION**

Only options for the Reflecting Pool structural system and water system would result in impacts to adjacent roadways during construction. Once completed, all options would have no long-term effects on traffic and transportation since they will not affect the adjacent roadways in the project area.

Option B1 would have short-term negligible impacts on transportation because the duration of construction would be only six months and there would be a relatively small volume of construction equipment required for implementation of this option. Options B2 and B3 would have minor adverse impacts during the construction period (expected to occur over more than one year) due to the construction equipment required to remove the demolished portions of the Reflecting Pool and bring in new concrete to create a new structural system.

Options C1 and C3 would result in short-term minor adverse impacts to transportation due to the required partial closure of portions of Independence Avenue SW to accommodate the installation of new subsurface supply and drain lines to the Reflecting Pool. Option C2 would have no effect on transportation. When combined with the short-term negligible to minor adverse impacts of Options B and C, there would be a net long-term beneficial cumulative impact on traffic in this area.

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## CHAPTER 5: CONSULTATION AND COORDINATION

The NPS places a high priority on public involvement in the NEPA process and on giving the public an opportunity to comment on proposed actions. As part of the NPS NEPA process, issues associated with the proposed action were identified during the internal scoping meeting held with NPS and have been communicated to other affected agencies and stakeholders.

### **Public Scoping**

In addition to internal and agency scoping, public scoping for the Lincoln Memorial Reflecting Pool Rehabilitation EA began June 30, 2009, and concluded August 14, 2009. During this time, a public scoping meeting was held on July 9, 2009, at the Old Post Office Pavilion, 1100 Pennsylvania Avenue NW, Washington, D.C. Notice of the public meetings was posted on the Planning, Environment, and Public Comment website (PEPC) and the NPS sent email notices of the meeting to individuals and organizations. Approximately one dozen people attended the meeting, including representatives from NCPC, the National Coalition to Save Our Mall, Guild of Professional Tour Guides, Committee of 100, and the Smithsonian Institution. The purpose of this meeting was to solicit public input on the purpose, need, and objectives of the project, major issues, and potential alternatives.

At the public meeting and during the 30-day public comment period, comments were received from the National Coalition to Save Our Mall, Guild of Professional Tour Guides, and Committee of 100. Generally, the comments articulated support for the proposed enhancements and rehabilitation of the elm walks, approachway, and Reflecting Pool. Some constituents stated that the NPS should explore alternative recreational uses for portions of the project area, including ice skating, fountains, and sculptures in the Reflecting Pool and a multi-transit plan along the elm walks. The NPS responded that these suggestions were outside the scope of the current project.

### **Consultation**

Coordination with local and federal agencies and various interest groups was conducted during the NEPA process to identify issues and/or concerns related to the proposed flood protection facilities within Potomac Park. In accordance with Section 7 of the Endangered Species Act, consultation letters were sent from the NPS to the U.S. Fish and Wildlife Service (USFWS); the DC DOE, Fisheries and Wildlife Division; and the District Department of Health, Environmental Health Administration on July 7, 2009.

### **Section 106 Consultation Process and Meetings**

Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. In accordance with the regulations implementing Section 106 of the NHPA, letters initiating the process were sent to the DC HPO and ACHP on July 7, 2009. On July 20, 2009, the DC HPO confirmed they would participate in the consultation process. Documentation of these efforts to obtain public agency consultation is contained in the appendix.



In addition, a number of agencies, organizations, stakeholders were invited to participate in this process as consulting parties:

- ACHP
- American Institute of Architects (AIA)
- American Society of Landscape Architects (ASLA)
- CFA
- Committee of 100
- Cultural Tourism D.C.
- DC HPO
- DC Preservation League (DCPL)
- Dwight D. Eisenhower Memorial Commission
- National Association of Olmsted Parks
- National Coalition to Save Our Mall
- National Parks Conservation Association
- National Trust for Historic Preservation (NTHP)
- Society of Architectural Historians
- Washington, D.C., Guild of Professional Tour Guides
- Washington, D.C., Martin Luther King, Jr., National Memorial Project Foundation

Throughout this project, the Section 106 process and NEPA assessment have been closely coordinated, and in some cases, public scoping has been utilized to satisfy the requirement for both processes. For the purposes of Section 106, several consulting party meetings were held:

- The public meeting for the EA also was the initial public meeting for the Section 106 process. The meeting was held on July 9, 2009, at the Old Post Office Pavilion, 1100 Pennsylvania Avenue NW, Washington, D.C.
- The NPS hosted a site visit on August 31, 2009, at the Reflecting Pool and surrounding area where the design team reviewed the proposed actions onsite.
- The second consulting parties meeting was held on September 15, 2009, at the offices of the NPS National Mall and Memorial Parks, 900 Ohio Drive SW, Washington, D.C.

The third consulting parties meeting will be held following the release of this Draft EA in January 2010.

## **Comment Period**

To comment on this EA, you may mail comments or submit them online at <http://parkplanning.nps.gov/NAMA> and follow the appropriate links. Please be aware that your comments and personal identifying information may be made publicly available at any time. While you may request that NPS withhold your personal information, we cannot guarantee that we will be able to do so. Please mail comments to:

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## Personal Communication

Weltzin, Rosanna

2009 Exchange of information with Rosanna Weltzin, Site Manager, National Mall and Memorial Parks regarding visitation to the project area in 2008.

## Acronyms

Advisory Council on Historic Preservation	(ACHP)
American Institute of Architects	(AIA)
American Society of Landscape Architects	(ASLA)
Americans with Disabilities Act	(ADA)
Architectural Barriers Act	(ABA)
Architectural Barriers Act Accessibility Standard	(ABAAS)
Area of Potential Effect	(APE)
Average Daily Trip	(ADT)
Choosing By Advantages	(CBA)
Combined Sewer Overflow	(CSO)
Clean Water Act	(CWA)
U. S. Commission of Fine Arts	(CFA)
Council on Environmental Quality	(CEQ)
Cultural Landscape Inventory	(CLI)
Cultural Landscape Report	(CLR)
Days Away From Work and Restricted Transfer	(DART)
Diameter at Breast Height	(DBH)
Dichlorodiphenyltrichloroethane	(DDT)
Director's Order 12	(DO-12)
District of Columbia Department of the Environment	(DC DOE)
District of Columbia Department of Transportation	(DC DDOT)
District of Columbia Historic Preservation Office	(DC HPO)
D.C. War Memorial	(DCWM)
District of Columbia Water and Sewer Authority	(DC WASA)
Environmental Assessment	(EA)
Environmental Impact Statement	(EIS)
Environmental Protection Agency	(EPA)
Environmental Screening Form	(ESF)
Federal Capital Improvements Program	(FCIP)
Federal Emergency Management Agency	(FEMA)
Federal Highway Administration	(FHWA)
Fiscal Year	(FY)
Franklin Delano Roosevelt	(FDR)
Gallons Per Day	(gpd)
Geographic Information Systems	(GIS)
Government Performance and Results Act	(GRPA)
Historic Preservation Review Board	(HPRB)
Long Term Control Plan	(LTCP)

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Martin Luther King, Jr.	(MLK)
Miles per Hour	(mph)
Most Probable Unit	(MPU)
Municipal Separate Storm Sewer	(MS4)
National Capital Planning Commission	(NCPC)
National Capital Urban Design and Security Plan	(NCUDSP)
National Environmental Policy Act	(NEPA)
National Historic Landmark	(NHL)
National Historic Preservation Act	(NHPA)
National Mall and Memorial Parks	(NAMA)
National Mall Plan	(NMP)
National Museum of African American History and Culture	(NMAAHC)
National Park Service	(NPS)
National Parks Omnibus Management Act	(NPOMA)
National Pollutant Discharge Elimination System	(NPDES)
National Register of Historic Places	(NRHP)
National Water Quality Assessment	(NAWQA)
Northwest	(NW)
Occupational Safety and Health Administration	(OSHA)
Potomac Electric Power Company	(PEPCO)
Planning, Environment, and Public Comment website	(PEPC)
Project Management Information System	(PMIS)
Polychlorinated Biphenyl	(PCB)
Pounds Per Square Inch	(psi)
Programmatic Agreement	(PA)
Southwest	(SW)
State Historic Preservation Officer	(SHPO)
Statement of Findings	(SOF)
Three Dimensional	(3d)
Total Maximum Daily Load	(TMDL)
Traditional Cultural Property	(TCP)
Tribal Historic Preservation Officers	(THPO)
United States Army Corps of Engineers	(USACE)
United States Fish and Wildlife Service	(USFWS)
United States Institute of Peace	(USIP)
United States Park Police	(USPP)
Value Analysis	(VA)
Vietnam Veterans Memorial Visitor Center	(VVMC)
Washington Metropolitan Transportation Authority	(WMATA)

## Key Word Glossary

**Affected Environment** — The existing environment to be affected by a proposed action and alternatives.

**Alignment** — The arrangement or relationship of several disparate components along a common vertical or horizontal line or edge.

**Allée** — A walkway lined with trees or tall shrubs.

**Best Management Practices** — Methods that have been determined to be the most effective, practical means of preventing or reducing pollution or other adverse environmental impacts.

**Bollard** — A short vertical post designed to obstruct the passage of motor vehicles.

**Commercial Services** — Any activity or service that occurs in a Park, for which compensation is made.

**Contributing Resource** — A building, site, structure, or object that adds to the historic significance of a property or district.

**Coping** — The capping or covering of a wall.

**Council on Environmental Quality** — Established by Congress within the Executive Office of the President with passage of the *National Environmental Policy Act* of 1969. CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

**Cultural Landscape** — Environments that include natural and cultural resources associated with a historical context.

**Cultural Resources** — Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reason.

**Cumulative Impacts** — Under NEPA regulations, the incremental environmental impact or effect of an action together with the effects of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR Part 1508.7).

**Enabling Legislation** — Legislation that gives appropriate officials the authority to implement or enforce the law.

**Endangered Species** — Any species that is in danger of extinction throughout all or a significant portion of its range. The lead federal agency for the listing of a species as endangered is the U.S. Fish and Wildlife Service, and it is responsible for reviewing the status of the species on a five-year basis.

**Endangered Species Act (16 U.S.C. 1531 et seq.)** — An Act which provides a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and which provides a program for the conservation of such endangered species and threatened species.

**Environmental Assessment** — An environmental analysis prepared pursuant to the *National Environmental Policy Act* to determine whether a federal action would significantly affect the environment and thus require a more detailed environmental impact statement (EIS).

**Environmental Impact Statement** — A report that documents the information required to evaluate the environmental impact of a project. It informs decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the environment.

**Executive Order** — Official proclamation issued by the President that may set forth policy or direction or establish specific duties in connection with the execution of federal laws and programs.

**Floodplain** — The flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood.

**Grade Beam**— A reinforced concrete beam placed directly on the ground to provide the foundation for a structure above.

**Impairment**— Within this document, the term impairment has two separate definitions. The NPS requires an analysis of potential effects to determine whether actions would impact or impair Park resources. NPS is empowered with the management discretion to allow impacts on Park resources and values (when necessary and appropriate) to fulfill the purposes of a Park, as long as the impact does not constitute impairment of the affected resources and values. Impairment is also a classification of poor water quality for a surface water body under the U.S. Clean Water Act.

**Jersey barrier** — A three-foot-tall concrete structure that ranges in length, most commonly used as a barrier to separate or stop moving vehicles.

**Ha-Ha**— A landscape design feature that utilizes a trench, the inner side of which is vertical, with the outer face sloped and turfed, making the trench, in effect, a sunken fence or retaining wall. The ha-ha is designed not to interrupt the view from a garden or park, and to be invisible until seen from close range.

**Kiosk**— A small structure where information (i.e. maps, pamphlets, and other literature, and/or advice) is dispensed by an attendant.

**Life Cycle Cost**— The analysis of the costs of a system or a component over its entire life span.

**Lower Approachway**— The historic staircases and landings between the Lincoln Memorial east plaza and Reflecting Pool.

**Mall** — The area west of the United States Capitol between Madison and Jefferson Drives from 1st to 14th Streets NW/SW. The east end of the Mall from 1st to 3rd streets NW/SW between Pennsylvania Avenue and Maryland Avenue and is also known as Union Square. The Mall is characterized by the east-west stretch of lawn bordered by rows of American elm trees.

**Monumental Core** — The monumental core currently includes the National Mall and the areas immediately beyond it, including the United States Capitol, the White House and President's Park, Pennsylvania Avenue and the Federal Triangle area, East and West Potomac Parks, the Southwest Federal Center, the Northwest Rectangle, Arlington Cemetery, and the Pentagon.

**National Environmental Policy Act (NEPA)** — The Act as amended, articulates the federal law that mandates protecting the quality of the human environment. It requires federal agencies to systematically assess the environmental impacts of their proposed activities, programs, and projects including the “no build” alternative of not pursuing the proposed action. NEPA requires agencies to consider alternative ways of accomplishing their missions in ways which are less damaging to the environment.

**National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.)** — An Act to establish a program for the preservation of historic properties throughout the nation, and for other purposes, approved October 15, 1966 [Public Law 89-665; 80 STAT. 915; 16 U.S.C. 470 as amended by Public Law 91-243, Public Law 93-54, Public Law 94-422, Public Law 94-458, Public Law 96-199, Public Law 96-244, Public Law 96-515, Public Law 98-483, Public Law 99-514, Public Law 100-127, and Public Law 102-575].

**National Mall** — The area comprised of the Mall, the Washington Monument, and West Potomac Park. It is managed by the NPS' National Mall and Memorials Parks.

**National Register of Historic Places (NRHP)** — A register of districts, sites, buildings, structures, and objects important in American history, architecture, archeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the *Historic Sites Act* of 1935 and Section 101(a)(1) of the *National Historic Preservation Act* of 1966, as amended.

**Outboard**— In this document, outboard refers to the outermost side of the elm walks, furthest from the Reflecting Pool.

**Piles**— A type of deep foundation in which long wood, steel, or concrete vertical elements are driven deep into the earth to support the weight of a structure above.

**Reflecting Pool**—Located directly east of the Lincoln Memorial, it is a long, rectangular pool visible in many photographs of the Washington Monument. It is lined by walking paths and shade trees on both sides. It reflects both the Washington Monument and the Lincoln Memorial. It is approximately 2,029 feet (618 m) long and 167 feet (51 m) wide. It has a depth of approximately 18 inches (46 cm) on the sides and 30 inches (76 cm) in the center. It holds approximately 6,750,000 U.S. gallons (25,500,000 L) of water.

**Remediation** — The removal of contaminants or pollution from soil, groundwater, sediment, or surface water for the protection of human health and the environment.

**Retaining Wall**— A wall built to hold soil in place.

**Scoping** — Scoping, as part of NEPA, requires examining a proposed action and its possible effects; establishing the depth of environmental analysis needed; and determining analysis procedures, data needed, and task assignments. The public is encouraged to participate and submit comments on proposed projects during the scoping period.

**Social Trail**— An unofficial trail that diverges from an existing trail, as a shortcut to the destination. A social trail usually cuts through a vegetative or natural barrier, such as woods, scrubs, grass fields, or berms.

**Threatened Species** — Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**Viewshed** — A viewshed includes a total visible area from a particular fixed vantage point.

**Vista**— A distant or long view, especially one seen through some opening such as an avenue or trees that form an avenue; a site offering such a view.

# APPENDIX **A**: CONSULTATION AND CORRESPONDENCE

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## United States Department of the Interior

NATIONAL PARK SERVICE  
National Mall & Memorial Parks  
900 Ohio Drive, S.W.  
Washington, D.C. 20024-2000



L76 (NCR-NAMA)

JUL 7 2009

Mr. Brian D. King  
Associate Director  
Wildlife Management Branch  
Fisheries & Wildlife Division  
D.C. Department of the Environment  
51 N Street, N.E.  
Washington, D.C. 20002

Dear Mr. King:

The National Park Service (NPS) is preparing an Environmental Assessment (EA) for the Rehabilitation of the Reflecting Pool and surrounding area in accordance with the National Environmental Policy Act (NEPA) of 1969.

Multiple improvements are proposed within the immediately vicinity of the Reflecting Pool to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations. At the Reflecting Pool, upgrades are proposed both to improve its water supply, drainage, and structural system as well as to formalize walkways along the worn dirt paths created by approximately 4.5 million annual visitors travelling between the World War II Memorial and the Lincoln Memorial. To the north and south of the Reflecting Pool along the historic elm walks, the site furnishings would be reconfigured and the walkways would be upgraded to enhance visitor experience. To the west end of the elm walks, improvements are proposed that integrate accessible pathways down to the Reflecting Pool with a permanent vehicular security system to replace the temporary concrete closure at the center section of the Lincoln Memorial east plaza.

We are writing you to request a list of federally listed species that may be impacted by this proposed project, and to initiate informal Section 7 consultation. Because of its location in a highly urbanized environment in downtown Washington, D.C., it is unlikely that these proposed actions will affect any federally listed or locally sensitive species. However, we would appreciate written confirmation from your office. A letter is also being sent to the U.S. Fish and Wildlife Service to solicit their input.

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If you have any questions or require additional information, please contact me or Perry Wheelock, Chief, Resource Management at (202) 245-4711, or by email at perry\_wheelock@nps.gov. Thank you in advance for your assistance.

Sincerely,

A handwritten signature in blue ink that reads "Lisa A Mendelson-Idmini". The signature is written in a cursive style.

Acting Superintendent, National Mail and Memorial Parks

Enclosure

cc:

Ms. Jill Cavanaugh

The Louis Berger Group, Inc.



## United States Department of the Interior

NATIONAL PARK SERVICE  
National Mall & Memorial Parks  
900 Ohio Drive, S.W.  
Washington, D.C. 20024-2000



L76 (NCR-NAMA)

JUL 7 2009

Mr. John Wolflin  
U.S. Fish and Wildlife Service  
177 Admiral Cochrane Drive  
Annapolis, Maryland 21401

Dear Mr. Wolflin:

The National Park Service (NPS) is preparing an Environmental Assessment (EA) for the Rehabilitation of the Reflecting Pool and surrounding area in accordance with the National Environmental Policy Act (NEPA) of 1969.

Multiple improvements are proposed within the immediately vicinity of the Reflecting Pool to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations. At the Reflecting Pool, upgrades are proposed both to improve its water supply, drainage, and structural system as well as to formalize walkways along the worn dirt paths created by approximately 4.5 million annual visitors travelling between the World War II Memorial and the Lincoln Memorial. To the north and south of the Reflecting Pool along the historic elm walks, the site furnishings would be reconfigured and the walkways would be upgraded to enhance visitor experience. To the west end of the elm walks, improvements are proposed that integrate accessible pathways down to the Reflecting Pool with a permanent vehicular security system to replace the temporary concrete closure at the center section of the Lincoln Memorial east plaza.

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If you have any questions or require additional information, please contact Perry Wheelock, Chief, Resource Management at (202) 245-4711, or by email at [perry\\_wheelock@nps.gov](mailto:perry_wheelock@nps.gov). Thank you in advance for your assistance.

Sincerely,

Acting Superintendent, National Mall and Memorial Parks

Enclosure

cc:

Ms. Jill Cavanaugh  
The Louis Berger Group, Inc.



Section 7 Endangered Species Act Correspondence Enclosure

*Lincoln Memorial Reflecting Pool Project Area*



\* The project area has since been amended to accommodate infrastructure improvements



## United States Department of the Interior

NATIONAL PARK SERVICE  
National Mall & Memorial Parks  
900 Ohio Drive, S.W.  
Washington, D.C. 20024-2000



L76 (NCR-NAMA)

JUL 7 2009

Mr. David Maloney  
State Historic Preservation Officer  
District of Columbia Office of Planning  
2000 14<sup>th</sup> Street N.W., 4<sup>th</sup> Floor  
Washington, D.C. 20009

Dear Mr. Maloney:

Subject: Section 106 Consultation – Lincoln Memorial Reflecting Pool Area  
Rehabilitation Project

The National Park Service (NPS) wishes to formally initiate consultation with the District of Columbia Historic Preservation Office under Section 106 of the National Historic Preservation Act on the Lincoln Memorial Reflecting Pool Area Rehabilitation Project, an undertaking, in accordance with 36 CFR 800.3 of the regulations of the Advisory Council on Historic Preservation (ACHP). The NPS is aware of and appreciates your participation in early concept design reviews already held on the project.

The Lincoln Memorial Reflecting Pool, an icon of the National Mall in Washington, D.C., has experienced structural problems due to differential settlement of the soils on which it was built. Adjacent utilities, public accommodation, and security features all require upgrading. The Reflecting Pool area rehabilitation is a project to be funded under the American Recovery and Reinvestment Act (ARRA) which will accomplish needed repairs and improvements to this major feature of the Lincoln Memorial cultural landscape as well as contribute to local economic recovery. Please refer to the attached materials which provide a synopsis of the goals and anticipated work components of the project. The materials include a preliminary list of consulting parties and a proposed Area of Potential Effect (APE), generally District of Columbia Reservations 2 and 332. Both items are intended as a basis of discussion, subject to modification, so as to expedite the consultation process.

Intersecting the proposed APE are many highly significant cultural resources on or eligible for listing in the National Register of Historic Places including the Lincoln Memorial, the Washington Monument, the World War II Memorial, the Vietnam Veterans Memorial, the Korean War Veterans Memorial, the West Potomac Park Historic District, and - of most immediate impact -the grounds of the Lincoln Memorial. These resources have been extensively documented in connection with other projects on the National Mall; therefore we see no additional survey requirements on potentially affected architectural or landscape resources.

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Also, no impact to archeology is anticipated due to the fact that the project area consists of approximately 14 to 16 feet above mean sea level of fill over former marshland.

The NPS has outlined the proposed project as part of the ongoing planning for the National Mall. The National Mall Plan will provide a long range vision for the use and management of the National Mall from First Street, N.W. to the Potomac River and from Constitution Avenue, N.W. and the Ellipse to the southern edge of West Potomac Park. The plan is the subject of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA). The NPS expects the draft EIS document to be available for public review later in 2009.

The NPS has also begun an Environmental Assessment (EA) to analyze impacts specific to the Lincoln Memorial Reflecting Pool Area Rehabilitation Project. The NPS intends to coordinate Section 106 process with the National Environmental Policy Act per the ACHP's regulations (36 CFR 800.8).(NEPA). The NPS plans to consult the public per 800.3(e) in public meetings and through our Planning, Environment, and Public Comment website – [www.parkplanning/nps.gov](http://www.parkplanning/nps.gov). It is anticipated that these outreach efforts will accommodate both NEPA and the 106 process. The first meeting open to the public will be a public scoping meeting to be held from 5:30 p.m. to 8:00 p.m. on Thursday, July 9, 2009 in Room M09, of the Old Post Office Building, 1100 Pennsylvania Avenue N.W., Washington, D.C. 20004.

At this conceptual design stage, the NPS is not prepared to make a formal determination of effect for the Lincoln Memorial Reflecting Pool Area Rehabilitation Project, but looks forward to consultation with the District of Columbia Preservation Office on this and other steps in the process.

Thank you for your help. If you have any questions, please do not hesitate to call me or Perry Wheelock, Chief, Resource Management, National Mall and Memorial Parks at (202) 245-4711.

Sincerely,



Acting Superintendent, National Mall and Memorial Parks

Enclosures

cc:

Mr. Reid Nelson  
Advisory Council on Historic Preservation

Ms. Nancy Witherell  
National Capital Planning Commission

Mr. Tom Luebke  
Commission of Fine Arts



## United States Department of the Interior

NATIONAL PARK SERVICE  
National Mall & Memorial Parks  
900 Ohio Drive, S.W.  
Washington, D.C. 20024-2000



L76 (NCR-NAMA)

JUL 7 2009

Mr. Reid Nelson  
Director  
Office of Federal Agency Programs  
Advisory Council on Historic Preservation  
1100 Pennsylvania Avenue, N.W., Suite 803  
Washington, D.C. 20004

Dear Mr. Nelson:

The National Park Service (NPS) has initiated consultation with the District of Columbia State Historic Preservation Officer (DC SHPO) on the design and construction of the Lincoln Memorial Reflecting Pool Area Rehabilitation, an undertaking which will have an effect upon historic properties under Section 106 of the National Historic Preservation Act.

The Reflecting Pool, an icon of the National Mall in Washington, D.C., has experienced structural problems due to differential settlement of the soils on which it was built. Adjacent utilities, public accommodation, and security features also require upgrading. The Lincoln Memorial Reflecting Pool Area Rehabilitation is a project to be funded under the American Recovery and Reinvestment Act (ARRA) which will accomplish needed repairs and improvements to this major feature of the Lincoln Memorial cultural landscape as well as contribute to local economic recovery. Please refer to the attached materials which provide a synopsis of the goals and anticipated work components of the project. The materials include a preliminary list of consulting parties and a proposed Area of Potential Effect (APE), generally District of Columbia Reservations 2 and 332.

The NPS has outlined the proposed project as part of the ongoing planning for the National Mall. The National Mall Plan will provide a long range vision for the use and management of the National Mall from First Street, N.W. to the Potomac River and from Constitution Avenue, N.W. and the Ellipse to the southern edge of West Potomac Park. The plan is the subject of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA). The NPS expects the draft EIS document to be available for public review later in 2009.

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The NPS has also begun to develop an Environmental Assessment (EA) to analyze impacts specific to the Lincoln Memorial Reflecting Pool Area Rehabilitation Project. The NPS intends to coordinate Section 106 process with the NEPA per the ACHP's regulations (36 CFR 800.8).(NEPA). The NPS plans to consult the public per 800.3(e) in public meetings and through our Planning, Environment, and Public Comment website – [www.parkplanning/nps.gov](http://www.parkplanning/nps.gov). It is anticipated that these outreach efforts will accommodate both NEPA and the 106 process. The first meeting open to the public will be the public scoping meeting to be held from 5:30 p.m. to 8:00 p.m. on Thursday, July 9, 2009 in Room M09, of the Old Post Office Building, 1100 Pennsylvania Avenue N.W., Washington, D.C. 20004.

At this conceptual stage, the NPS has not yet made a formal determination of the effect of the project on historic properties. However, we acknowledge the sensitivity of the complex overlay of National Register of Historic Places resources present at the western end of the National Mall. The historic buildings, structures, cultural landscapes, and associated vistas are among the nation's most significant. No impact to archeology is anticipated, however, due to the fact that the project area consists of approximately 14 to 16 feet above mean sea level of fill over former marshland.

Because of the sensitive nature of the project site, and the potential for adverse effects, we are happy to invite the active participation of the Council in the Section 106 process. Please indicate whether you wish to do so or have any other questions about the undertaking by contacting me or Perry Wheelock, Chief, Resource Management, National Mall and Memorial Parks at (202) 245-4711.

Sincerely,

*Lisa A Mendelson - Telmini*

Acting Superintendent, National Mall and Memorial Parks

Enclosures

cc:

Mr. David Maloney  
District of Columbia Historic Preservation Office

Ms. Nancy Witherell  
National Capital Planning Commission

Mr. Tom Luebke  
Commission of Fine Arts

Section 106 Correspondence Enclosure

*Draft Area of Potential Effect*





GOVERNMENT OF THE DISTRICT OF COLUMBIA  
STATE HISTORIC PRESERVATION OFFICER



July 20, 2009

Ms. Lisa A. Mendleson-Ielmini  
Acting Superintendent, National Mall and Memorial Parks  
National Park Service  
900 Ohio Drive, SW  
Washington, DC 20024-2000

RE: Initiation of Section 106 Consultation – Lincoln Memorial Reflecting Pool Area Rehabilitation

Dear Ms. Mendleson-Ielmini:

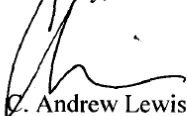
Thank you for contacting the DC State Historic Preservation Office (SHPO) regarding the above-referenced undertaking. We have reviewed the project information in accordance with Section 106 of the National Historic Preservation Act (NHPA) and are writing to provide our initial comments regarding effects on historic properties. We are also providing these comments in accordance with the National Environmental Policy Act (NEPA) to assist the National Park Service (NPS) in coordinating its review processes.

We understand that the NPS is proposing to implement a variety of improvements to the Lincoln Memorial Reflecting Pool Area including repairs to the reflecting pool, installation of security measures, lighting and site furnishing and making other alterations that will enhance accessibility and address deficiencies in existing circulation systems.

Since the proposed improvements are to be implemented with funds from the American Recovery and Reinvestment Act (ARRA), it is important that consultation remain on schedule to facilitate meeting specific funding-related deadlines. To that end, we concur with the project's proposed Area of Potential Effect (APE) and agree that no further survey or evaluation of historic properties will be necessary. We also agree that archaeological properties are not likely to be present since the project site is located on fill. The list of consulting parties that NPS has prepared also appears appropriate given the degree to which the proposed improvements have already been coordinated in meetings and materials developed for the National Mall Plan. We note that one public scoping meeting has already occurred and that others will be scheduled as the Environmental Assessment (EA) for the project is developed.

We look forward to working with all parties to complete the review of this important project and will provide additional comments as consultation progresses. In the meantime, please feel free to contact me at [andrew.lewis@dc.gov](mailto:andrew.lewis@dc.gov) or 202-442-8841 if you should have any questions or comments this matter. Thank you for providing this initial opportunity to review and comment.

Sincerely,



C. Andrew Lewis  
Senior Historic Preservation Specialist  
DC State Historic Preservation Office

09-176

# APPENDIX **B**: FLOODPLAINS STATEMENT OF FINDINGS

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## FLOODPLAIN STATEMENT OF FINDINGS

*For the Rehabilitation of the Lincoln Memorial Reflecting Pool and surrounding area*

Washington, DC

December, 2009

Recommended:

\_\_\_\_\_  
John Piltzecker  
Superintendent National Mall and Memorial Parks

Date

Concurred:

\_\_\_\_\_  
Bill Jackson  
Water Resources Division

Date

Approved:

\_\_\_\_\_  
Margaret O'Dell  
Regional Director – National Capital Region

Date

**INTRODUCTION**

Executive Orders 11988 (“Floodplain Management”) and 11990 (“Protection of Wetlands”) require the NPS and other Federal agencies to evaluate the likely impacts of actions in floodplains and wetlands. The objectives of the Executive Orders are to avoid to the extent possible the long-term and short-term adverse impacts associated with occupancy, modification, or destruction of floodplains and wetlands and to avoid indirect support of development and new construction in such areas wherever there is a practicable alternative. The purpose of this Statement of Findings (SOF) is to present the rationale for the location of this project in the floodplain, describe the amount of risk associated with the project site, and describe associated flood mitigation plans.

Figure B.1 – Lincoln Memorial Reflecting Pool Project Area



## **PROJECT DESCRIPTION/SITE LOCATION**

The National Park Service (NPS) has prepared an Environmental Assessment (EA) to evaluate a range of alternatives for the rehabilitation of the Lincoln Memorial Reflecting Pool (Reflecting Pool) and surrounding area. The proposed actions are located primarily on the Lincoln Memorial Grounds, but some proposed actions will affect a larger area of impact including portions of West Potomac Park between the east edge of Lincoln Memorial Circle and Ohio Drive SW and West Basin Drive SW to the south. The project location is delineated in Figure B.1. The project area is generally flat and contains the Reflecting Pool, surrounding turf grass areas, rows of historic elm trees, pedestrian paths and furnishings, and the paved plaza to the east of the Lincoln Memorial.

The EA presents an action alternative for multiple improvements to rehabilitate and enhance the infrastructure, circulation, accessibility, and historic resources at various locations around the Reflecting Pool. At the Reflecting Pool, upgrades are proposed both to improve its water supply, drainage, and structural system as well as to formalize walkways along the worn dirt paths created by approximately 4.5 million annual visitors travelling between the World War II Memorial and the Lincoln Memorial. To the north and south of the Reflecting Pool along the historic elm walks, the site furnishings would be reconfigured, permanent lighting would be installed, and the walkways would be upgraded to enhance visitor experience. Improvements to the pedestrian circulation systems are needed to enhance public safety, to provide universal accessibility, and to restore and protect historic resources. To the west end of the elm walks, improvements are proposed that integrate accessible pathways down to the Reflecting Pool with a permanent vehicular security system to replace the temporary bollards at the center section of the Lincoln Memorial east plaza, as they are inconsistent with the historic character of the project area.

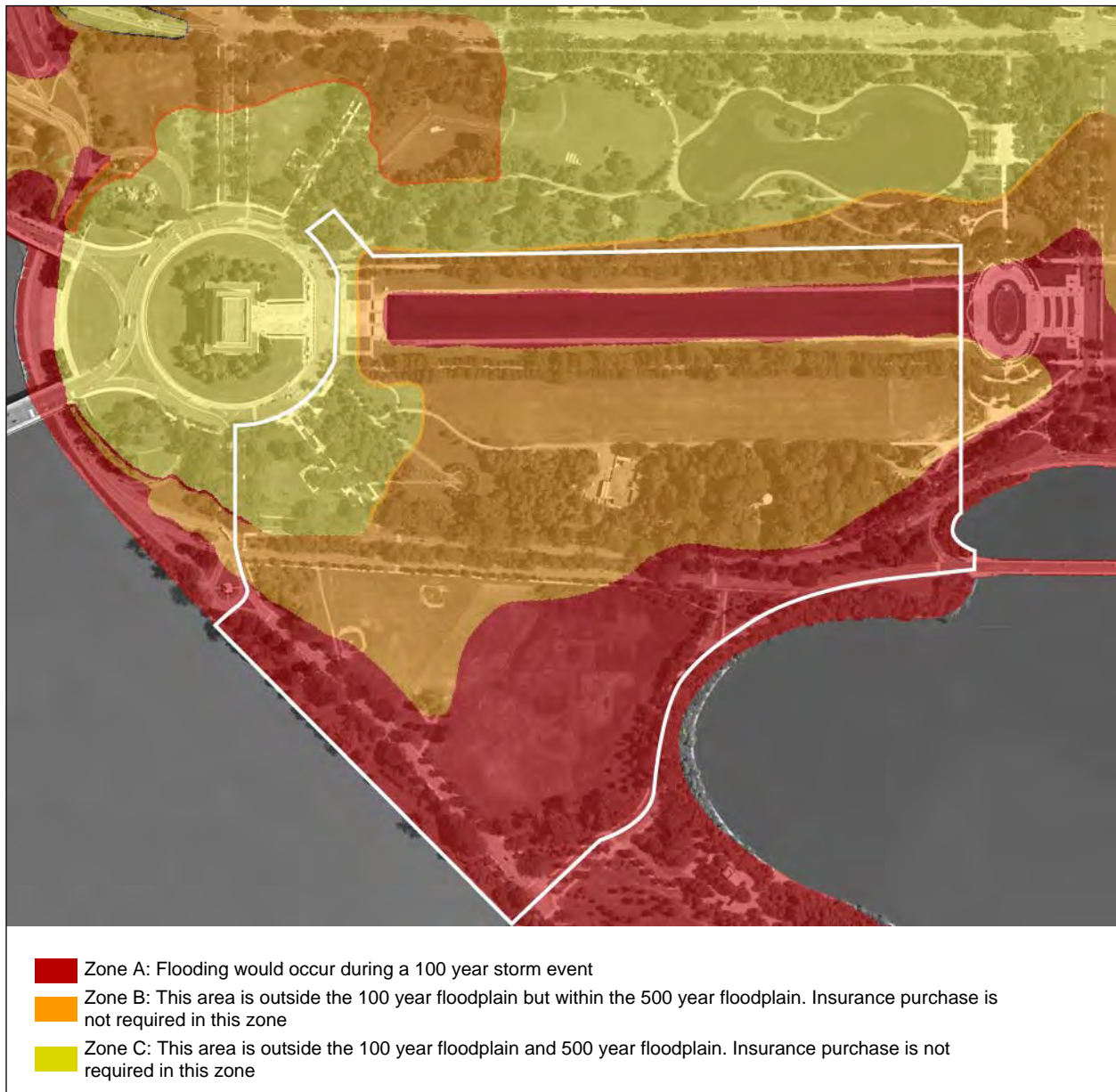
## **JUSTIFICATION FOR THE USE OF FLOODPLAIN**

Portions of the project area are located within designated high hazard floodplains. Although the NPS is under executive order and policy to reduce or eliminate development in floodplains, this is not possible in the project area because the required improvements to Reflecting Pool and surrounding area are located within the 100-year floodplain (per the current FEMA mapping) with a small portion to the southwest corner of the project area located within the 500-year floodplain (See Figure B.2). The proposed improvements constitute maintenance actions necessary for the preservation of public safety, improvements to visitor use and experience, and to restore and protect historic resources. Therefore, although the project must occur within the floodplain, the extent of development, placement of structures, and types of structures would be selected to minimize impacts.

## **SITE-SPECIFIC FLOOD RISK**

The project area within West Potomac Park lies at a low elevation and is relatively flat. The project area, including the north elm walk, Reflecting Pool and Lincoln Memorial east plaza are currently designated as Zone A, within the 100-year flood zone. As witnessed during past storm events, any buildings or other facilities located in this floodplain has the potential to be impacted by flood waters, high winds, and storm surge. To the southwest of the project area, at the western terminus of the southern elm walk, there is a small area designated as Zone B- between the limits of the 100-year flood and 500-year flood.

Figure B.2 –Floodplains in the Project Area



### FLOOD MITIGATION PLANS

The proposed improvements do not involve the construction of new buildings or structures; rather, the majority of improvements would involve infrastructure upgrades (structural and utility systems) and the implementation of minor site improvements (reconfiguration of site furnishings, walkway surface treatment enhancements, etc.). The most invasive proposed action involves the reconfiguration of the western termini of the elm walks and the incorporation of accessible pathways with an integrated perimeter security system solution.

During site preparation and construction, efforts to preserve existing vegetation within the floodplain will be undertaken as standard procedure. Any vegetation removed to accommodate the proposed improvements would be replaced in-kind within the flood zone. Floodplain values would be protected to the maximum extent possible and potential flood hazards would be minimized.

## **SUMMARY**

Because the proposed project constitutes enhancements for public safety, visitor use and experience, and historic resources, actions must be carried out within the 100-year floodplain. Specifically, the proposed improvements to the Reflecting Pool and surrounding area are within or adjacent to the 100-year floodplain. Since the proposed improvements must be undertaken at the location of the resources themselves, there are no other practicable siting alternatives that could be reasonably considered for this project. Mitigation and compliance with regulations and policies to prevent impacts to water quality, floodplain values, and loss of property or human life would be strictly adhered to during and after construction. No long-term adverse impacts to floodplain functions or values would occur from the implementation of the Preferred Alternative. Therefore, the National Park Service finds that this project is in compliance with Executive Order 11988: "Floodplain Management" and NPS DO-77-2.

In accordance with Executive Order 11988 for the protection of floodplains, mitigation and compliance with regulations and policies to prevent impacts to water quality, floodplain values, and loss of property or human life would be strictly adhered to during the design and construction of the proposed actions at the Reflecting Pool and surrounding area. The NPS finds that no long-term adverse impacts to the 100-year designated floodplain would occur from the proposed actions.





As the nation’s principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NPS 806/100193, NPS 802/100193/ December 2009