

Environmental Assessment

HARPERS FERRY WATER WORKS WATER SUPPLY LINE RELOCATION

Harpers Ferry National Historical Park

February 2007

ENVIRONMENTAL ASSESSMENT

HARPERS FERRY WATER WORKS WATER SUPPLY LINE RELOCATION

United States Department of the Interior
National Park Service
Harpers Ferry National Historical Park

Summary

The National Park Service has prepared this Environmental Assessment to evaluate a request by the Harpers Ferry Water Works, a public utility owned and operated by the Corporation of Harpers Ferry, West Virginia, to relocate approximately 200 feet of its main 8-inch water supply line in the vicinity of the Water Treatment Plant on Bakerton Road. This portion of the supply line runs through the park and connects to the water tanks on Bolivar Heights. The current waterline is exposed where it crosses Elk Run. This exposed section can be damaged by floating debris during flood events which could disrupt and/or contaminate the water supply which serves the Towns of Harpers Ferry and Bolivar and the National Park Service. The Water Works has requested to relocate the line to a more suitable location on park land approximately 75 feet south of Elk Run. The existing water line would be removed from the stream when the new line is completed.

This project involves the following; trenching along the route of the new line to a suitable depth, boring under Bakerton Road and installing a sleeve for the new line, installing approximately 200 feet of new 8-inch line, installing a suitable fill material to protect the new line, and removing approximately 20 feet of the existing 8-inch line where it crosses Elk Run.

This EA addresses the potential impacts associated with the Preferred Alternative (relocate 200-foot section of main supply line), together with a No-Action Alternative, in accordance with the National Environmental Policy Act of 1969, as amended. The Preferred Alternative would have short-term, negligible, adverse impacts on vegetation, wildlife, soils and geology (karst features), and long-term, minor beneficial effects on the stability and protection of the community's water supply.

Note to Reviewers and Respondents:

This EA is available for public review from January 30 to February 28, 2007. During this 30-day period, hard copies will be available in the Bolivar Library, the Harpers Ferry Town Hall, and the park headquarters in the Morrell House on Fillmore Street. A digital Acrobat Reader (pdf) version will be available on the park's website at <http://www.nps.gov/hafe> by clicking "Management" on the left side of the webpage. For those who have bookmarked the park's website, please reset your bookmark to this URL address.

If you wish to comment on the EA, you may mail comments to the name and address below. You may also email comments to HAFE_Superintendent@nps.gov. Our practice is to make comments, including names and home addresses of respondents available for review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or

businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to:

Superintendent
Harpers Ferry National Historical Park
P.O. Box 65
Harpers Ferry, WV 25425

February 2007

TABLE OF CONTENTS

1.0 PURPOSE OF AND NEED FOR THE ACTION 1
Purpose of and Need for the Action..... 1
Background and History 1
Compliance with Regulations 3
Issues and Impact Topics 3
Impact Topics Dismissed From Further Analysis..... 5

2.0 ALTERNATIVES 11
Alternative A: No-Action Alternative.....11
Alternative B: Preferred Alternative11
Environmentally Preferred Alternative13

3.0 AFFECTED ENVIRONMENT 14
Vegetation14
Wildlife14
Soils15
Geology16

4.0 ENVIRONMENTAL CONSEQUENCES 18
Methods and Assumptions for Analyzing Impacts18
Intensity of Impact.....18
Impairment of National Park Resources20
Impacts of Alternative A - No Action21
Impacts of Alternative B - Preferred Alternative24

5.0 CONSULTATION AND COORDINATION 26

6.0 APPENDICES, SELECTED REFERENCES, PREPARERS AND
CONSULTANTS 27
Appendices27
Selected References27
Preparers and Consultants.....28

1.0 PURPOSE OF AND NEED FOR THE ACTION

Purpose of and Need for the Action

The Harpers Ferry Water Works, which is owned and operated by the Corporation of Harpers Ferry, Harpers Ferry, West Virginia, has requested to relocate approximately 200 feet of its main water supply line in the vicinity of the Water Treatment Plant on Bakerton Road. This portion of the supply line runs through the park and connects to the water tanks on Bolivar Heights. The current waterline is exposed where it crosses Elk Run. This exposed section can be damaged by floating debris during flood events which would disrupt water supply to the Towns of Harpers Ferry and Bolivar and the National Park Service. The Water Works has requested to relocate the line to a more suitable location on park land approximately 75 feet south of Elk Run. The existing water line would be removed from the stream when the new line is completed. The abandoned portion of the line in the ground would be left in place.

This project involves the following; trenching along the route of the new line to a suitable depth, boring under Bakerton Road and installing a sleeve for the new line, installing approximately 200 feet of new 8-inch supply line, installing a suitable fill material to protect the new line, and removing approximately 20 feet of the existing 8-inch line where it crosses Elk Run.

This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act of 1969, the regulations of the Council on Environmental Quality for implementing the Act, and the National Park Service Director's Order #12 (Conservation Planning, Environmental Impact Analysis, and Decision-making), and NPS Management Policies, 2001.

Background and History

Harpers Ferry National Historical Park (HAFE) was authorized in 1944 by an act of Congress as "a national public memorial commemorating historical events at or near Harpers Ferry" (Public Law 78-386). HAFE is a unit of the National Park System encompassing 3,645 acres in West Virginia, Virginia, and

Maryland. This project is located in the West Virginia portion of the park (Fig. 1).

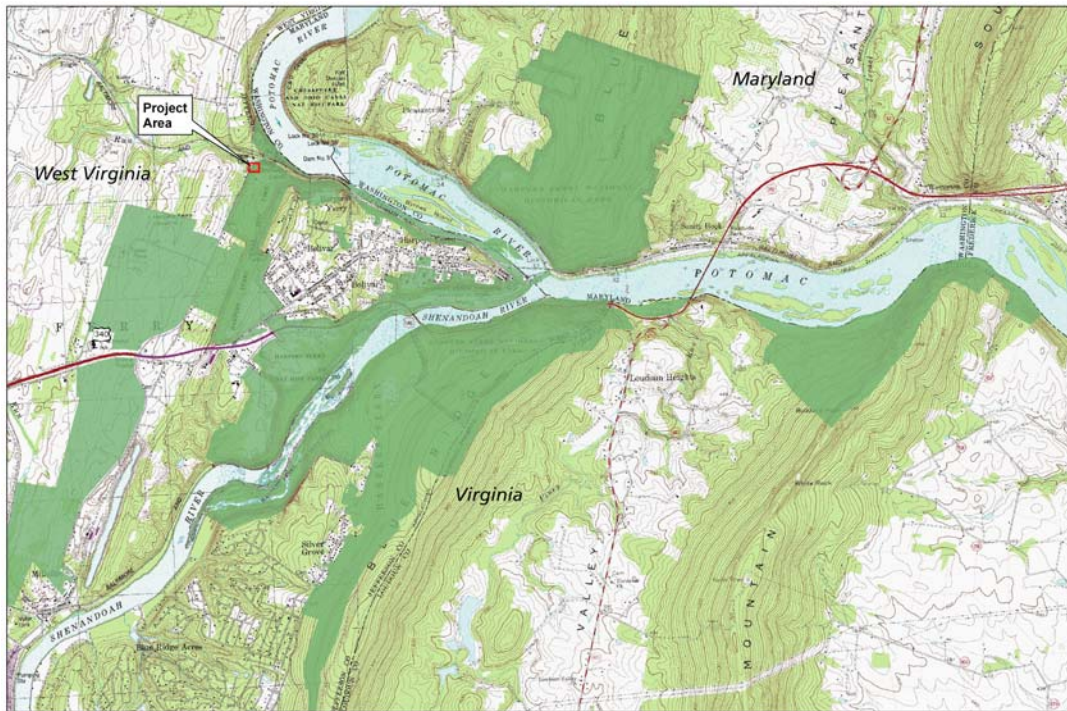


Figure 1: *Vicinity Map*

The project site is located on NPS Tract 102-11 which was acquired by the United States from Eugene P. Capriotti on June 21, 1977 by Declaration of Taking (Deed Book 424 at page 485). The property was acquired subject to an existing 30-foot wide easement that was conveyed to the Corporation of Harpers Ferry by Martin-Marietta Corporation in 1964 for the installation of a waterline. Martin-Marietta is predecessor in title to Capriotti. The Deed of Easement is dated August 22, 1964 (Deed Book 269 at page 277).

Tract 102-11 is also subject to a perpetual easement to the Department of Highways, State of West Virginia for public road purposes (Bakerton Road). This easement was conveyed by Eugene P. Capriotti to the Department of Highways on February 28, 1975. The easement is recorded in Deed Book 387 at page 187. The subject waterline runs under the public road and its proposed relocation will require boring under the road approximately 75 feet south of the current road crossing.

This tract is shown on the August 6, 1974 plat titled, "Corrected Plat Showing Division of Elk Run Timbers" revised through June 5, 1975 by John Stroud Kusner (Deed Book 390 on page 599).

Compliance with Regulations

The *National Environmental Policy Act of 1969* (Title 42 U.S. Code §4321 to 4370) requires detailed and documented environmental analysis of proposed federal actions that may affect the quality of the human environment. The preparation and public review of this environmental assessment satisfies the requirements of this federal law.

The *National Historic Preservation Act of 1966*, as amended, (16 U.S.C. §470 et seq.) recommends that federal agencies proposing action consult with the State Historic Preservation Officer regarding the existence and significance of cultural and historical resource sites. A review of historical records and cultural resource knowledge of the project site indicates that there are no known architectural or archeological resources within the area of potential effects of the project; therefore, an Assessment of Effects will not be prepared.

The *Endangered Species Act of 1973* (ESA), as amended (16 U.S.C. §1531-1544) prohibits federal actions from jeopardizing the existence of federally listed threatened or endangered species or adversely affecting designated critical habitat. Federal agencies must consult with the U.S. Fish and Wildlife Service to determine the potential for adverse effects. While there are state and federal special status plant and animals species in or near the park, based on recent correspondence from the FWS and WV State Natural Heritage Program for other NPS projects near the site, there are no federally listed species, designated critical habitats or species of concern in the vicinity of the project; therefore, consultation with the FWS pursuant to Section 7 of the Endangered Species Act will not be undertaken.

Issues and Impact Topics

The parks natural and cultural resource management staff in consultation with the NCR Natural Resources and Science developed the issues and concerns, and the impact topics for this EA.

Issues

A portion of the Harpers Ferry Water Works main supply line is exposed where it crosses Elk Run (Fig. 2). This exposed section can be damaged by floating debris during flood events which would disrupt and possibly contaminate the water supply to the Towns of Harpers Ferry and Bolivar and the National Park Service. The Water Works has requested to relocate the line to a more suitable location on park land approximately 75 feet south of Elk Run (Appendix - Map of Project Area).

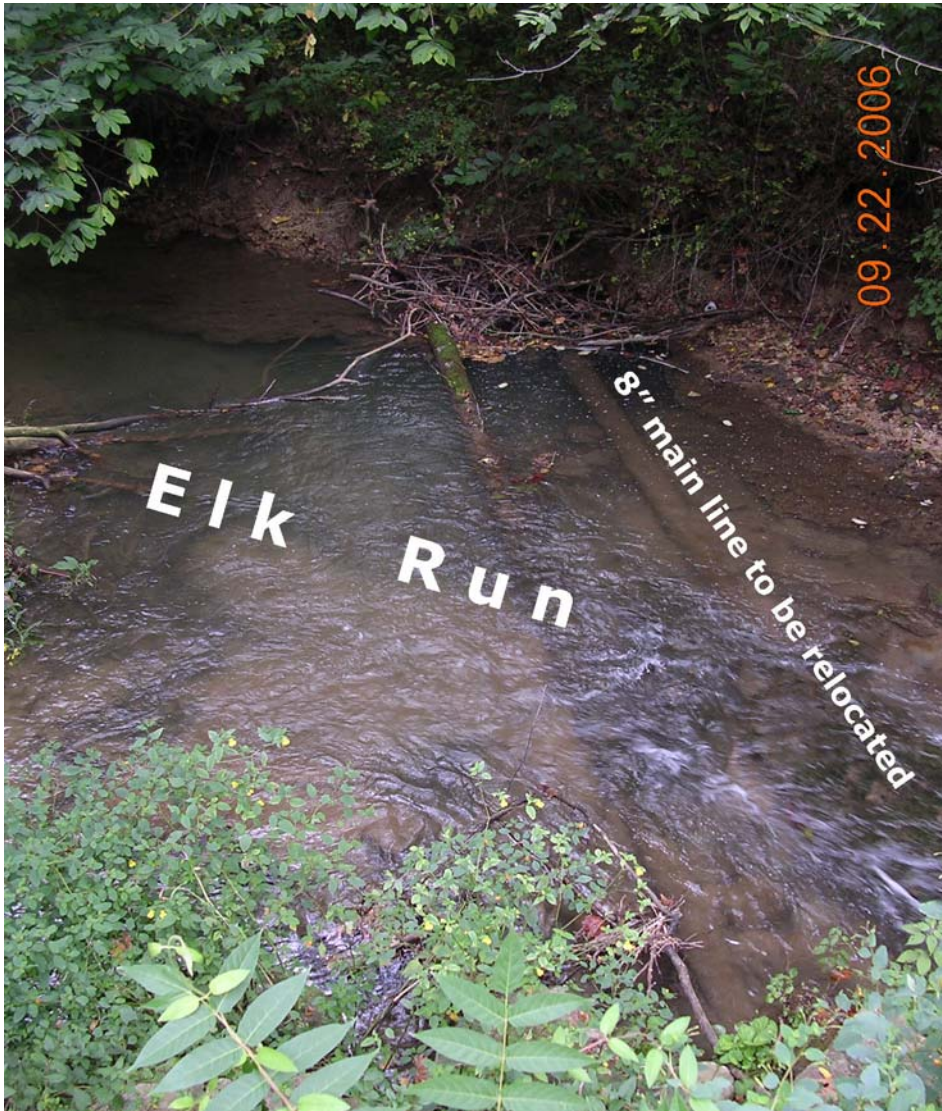


Figure 2: *Exposed waterline in Elk Run*

This project will require trenching along the route of the new line to a suitable depth, boring under Bakerton Road and installing a sleeve for the new line, installing approximately 200 feet of new

8-inch line, installing a suitable fill material to protect the new line, and removing approximately 20 feet of the existing 8-inch line where it crosses Elk Run.

Impact Topics Included in this Document

Impact topics are areas of concern that could be affected by the implementation of the alternatives. Each proposed alternative is evaluated by impact topics. The impact topics that are addressed in this EA include:

1. Vegetation – The proposed site for the relocation of the waterline is located in a floodplain forest environment. Construction activities will require removal of vegetation approximately 20-feet wide along the route of the new line. Constructing this line will have an effect on vegetation.
2. Wildlife - Constructing the line, which involves the use of machinery and requires removal of vegetation and disturbance of soil, could have an effect on wildlife habitats.
3. Soils – Construction activities require using heavy machinery to dig a trench approximately 2-feet wide and 200-feet in length. Depth of the trench will be based on standard engineering requirements for a waterline in this region. This activity will have an effect on soils within the disturbance area.
4. Geology- Construction activities could have an effect on geologic features.

These impact topics were identified based on federal laws, regulations, orders, National Park Service Management Policies, the Environmental Screening Form from NPS Director's Order #12 (Appendix, Environmental Screening Form) and from input from specialists during internal scoping. Public comments were solicited in the park's October 2006 Community Bulletin. No comments were received.

Impact Topics Dismissed From Further Analysis

Cultural Resources- NPS Management Policies 2001 categorize cultural resources as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources. The cultural resources are defined as follows- *Archeological resources* are the remains of past human activity and records documenting the scientific analysis of these remains. *Cultural landscapes* are settings we have created in the natural world. They reveal fundamental ties between people and the land. *Structures* are material assemblies that extend the limits of human capability. *Museum objects* are manifestations and records of behavior and ideas that span the breadth of human experience and depth of natural history. *Ethnographic resources* are basic expressions of human culture and the basis for continuity of cultural systems. A cultural system encompasses both the tangible and the intangible. It includes traditional arts and native languages, religious beliefs and subsistence activities (DO-28).

The geographic area of Elk Run has an early history associated with the charcoaling industry. In the mid 1800s the project area was part of "Furnace Hill" owned by Samuel Strider. The nearest documented cultural resources within NPS boundaries include the Old Furnace Road trace that is located approximately 700 ft. south of the project area and a Civil War era Magazine that is located southwest of the project area near the crest of Bolivar Heights. During the Civil War, the nearest known skirmish, took place at Peacher's Mill located a considerable distance from the Elk Run project area, along the Potomac River. No known architectural or archeological resources are recorded within the area of potential effect. The project area is not a documented cultural landscape and no museum objects or ethnographic resources are associated with this area. Because no cultural resources are known to exist in or in the proximity to the project area, this topic was dismissed.

Air Quality - The National Park Service (NPS) has a responsibility to protect air quality pursuant to the 1916 Organic Act, the Clean Air Act of 1970, and federal, state and local air pollution standards. The NPS will seek to perpetuate the best possible air quality in the park to (1) preserve the natural systems, (2) preserve the cultural resources and (3) sustain visitor enjoyment, scenic vistas, and cultural landscapes. Construction activities such as operating equipment, and vehicular exhaust

would be temporary and localized. Air quality was therefore dismissed as an impact topic.

Prime and Unique Farmlands - In August 1980, the Council on Environmental Quality (CEQ) directed that federal agencies assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. In order to be considered prime and unique, the farmland must be irrigated. The project site is not a farmland; therefore, this topic is dismissed from further analysis.

Water Resources (including Executive Order 11990 and Executive order 11988) - It is NPS policy to recognize and manage for the protection and preservation of wetland and floodplain values and to comply with the NPS Organic Act and all other federal laws and Executive orders related to the management of activities in wetlands and flood-prone areas. Specifically, it is the policy of the NPS to:

- Provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands;
- Preserve and enhance the natural and beneficial values of wetlands;
- Avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands;
- Protect and preserve the natural resources and functions of floodplains;
- Avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains;
- Avoid direct and indirect support of floodplain development and actions that could adversely affect the natural resources and functions of floodplains or increase flood risks;
- Restore, when practicable, natural floodplain values previously affected by land use activities within floodplains.

The U.S. Fish and Wildlife Service National Wetland Inventory Maps show there are no wetlands within the project area. In addition, a visit to the site verified there were no wetland indicators apparent in the area proposed to be affected, so there will be no adverse impacts to existing wetlands.

Executive Order 11988, "Floodplain Management" (May 28, 1980), was issued "to avoid to the extent possible the long and

short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.” The proposed action to excavate a ditch for the purpose of burying a waterline will only have a short term impact at the site during construction activities. There will be no new structures left on the surface of the effected floodplain. After the new waterline is in place and the soil is backfilled the affected area can be quickly stabilized and reclaimed. When state and local erosion and sediment control practices are implemented there would be little probability of any sediment from the proposed project reaching Elk Run.

The National Park Service Procedural Manual 77-2: Floodplain Management also allows for *Excepted Actions* for some activities that include: Emergency actions essential to protecting property and public health, provided that emergency actions are limited to the minimum required and that all possible steps are taken to mitigate the short and long term adverse impacts of these actions on floodplain values. If the existing waterline were to be left in its current location the probability exists that it could be damaged by debris flowing down the stream or some other mechanism. If the waterline was damaged, then treated water from the Water Treatment Plant would enter Elk Run and potentially have an adverse impact on the aquatic resources in the stream. A broken waterline could also impact the ability of the public to obtain safe drinking water which could create human health and safety issues. The proposed plan to remove the waterline out of the stream eliminates the chances of that event from occurring.

The proposed project will probably not cause any adverse impacts to wetlands, the floodplains or the water quality in Elk Run with in the proposed project area. Therefore a Statement of Findings will not have to be prepared for wetlands or floodplains.

Soundscape Management - In accordance with NPS Management Policies (2001) and Director's Order #47 (Sound Preservation and Noise Management), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The

frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. The soundscape along the properties is composed of both manmade and natural sounds. All of the properties described above are near major roadways where vehicular traffic can be heard. Heavy agriculture equipment is heard several times a year on the properties. Natural sounds include movement of water in the Shenandoah River, wind, birds, and other wildlife. Since this action does not produce or promote long-term existing unnatural sounds, it is dismissed as an impact topic.

Lightscape Management - In accordance with NPS Management Policies (2001), the NPS strives to preserve to the extent possible the quality of lighting associated with natural ambient landscapes and the night sky. Because the project area does not require artificial lighting, lightscape management was dismissed as an impact topic.

Socioeconomic Environment - The proposed action would neither change local and regional land nor impact local businesses or other agencies. The proposed project will have a short-term, minimal beneficial impact to local economies resulting from the minimal increases in temporary employment and acquisition of local products. Any benefits would be short-term and negligible; therefore, this impact topic was dismissed.

Environmental Justice - Environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies. The proposed action would not have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Therefore, this topic was dismissed from further review.

Ethnographic Resources - The NPS defines ethnographic resources 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" (DO-28). Because no ethnographic resources are known to exist in or in proximity to the project area, this topic was dismissed.

2.0 ALTERNATIVES

Alternative A: No-Action Alternative

Under the no-action alternative, the relocation of the waterline would not occur. The existing line including the portion that is exposed in Elk Run would continue to serve as the finished water supply line to the water tanks. Threats to the exposed line would continue possibly resulting in damage to the waterline which could cause a disruption of water service to the Towns and the NPS and possible contamination of drinking water.

Alternative B: Preferred Alternative

The preferred alternative is to relocate approximately 200 feet of the water supply line approximately 75 feet south of Elk Run on a level floodplain area. This will eliminate the threat to the portion of the waterline that is exposed in Elk Run. The exposed portion would be removed. The underground portion would be left in place.



Figure 3: *Project Area*

Installation will involve the following: trenching approximately 160 feet through a floodplain forest (Fig. 5); root pruning to protect mature trees, boring under Bakerton Road for approximately 40 feet (Fig. 4); installing a granular bedding material around the new pipe and backfilling the trench with the soil that was removed from the trench. The trench will be approximately 2' wide and 4'-6' feet deep. The area of disturbance within the project area is approximately 0.10 acres.



Figure 4: Project area in vicinity of water treatment plant.

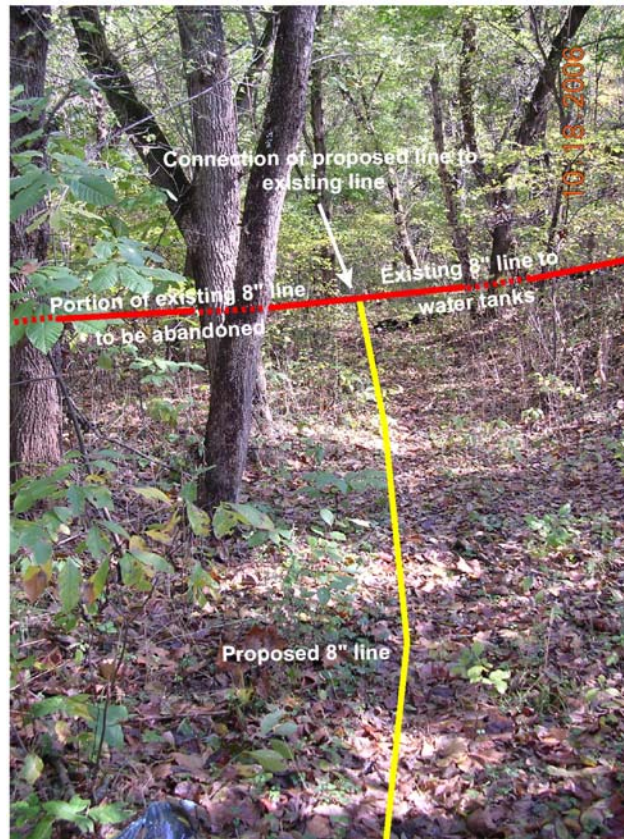


Figure 5: Project area in the woods east of Bakerton Road

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that the environmentally preferable alternative is the alternative that will promote "[t]he national environmental policy as expressed in Section 101 of NEPA, "which considers:

1. fulfilling the responsibility 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 will 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.

All of the goals except Goal 3 were dismissed as they did not make a difference in determining the environmentally preferred alternative. Alternative B provides a use of the environment for the new waterline that does not degrade the environment, does not present a risk to health and safety or cause other undesirable and unintended consequences. Alternative A does not satisfy this goal as it does not address the potential health and environmental risks that could result if the waterline line was breached.

For the above reasons, Alternative B is determined to be the environmentally preferred alternative.

3.0 AFFECTED ENVIRONMENT

Vegetation

The project site is mostly a deciduous forest classified as a sycamore-red ash floodplain forest (Fig. 6). Common canopy species include sycamore (*Plantanus occidentalis*) and box elder (*Acer negundo*). Understory species consists of spicebush (*Lindera benzoin*), pawpaw (*Asimna triloba*) and hackberry (*Celtis occidentalis*). A very small portion of the project area within the park on the west side of Bakerton Road is a lawn landscape maintained by employees of the Harpers Ferry Water Works. There are no state or federal-listed species within the project area. Garlic mustard (*Alliaria petiolo*), a non-native species, is established in the project area.

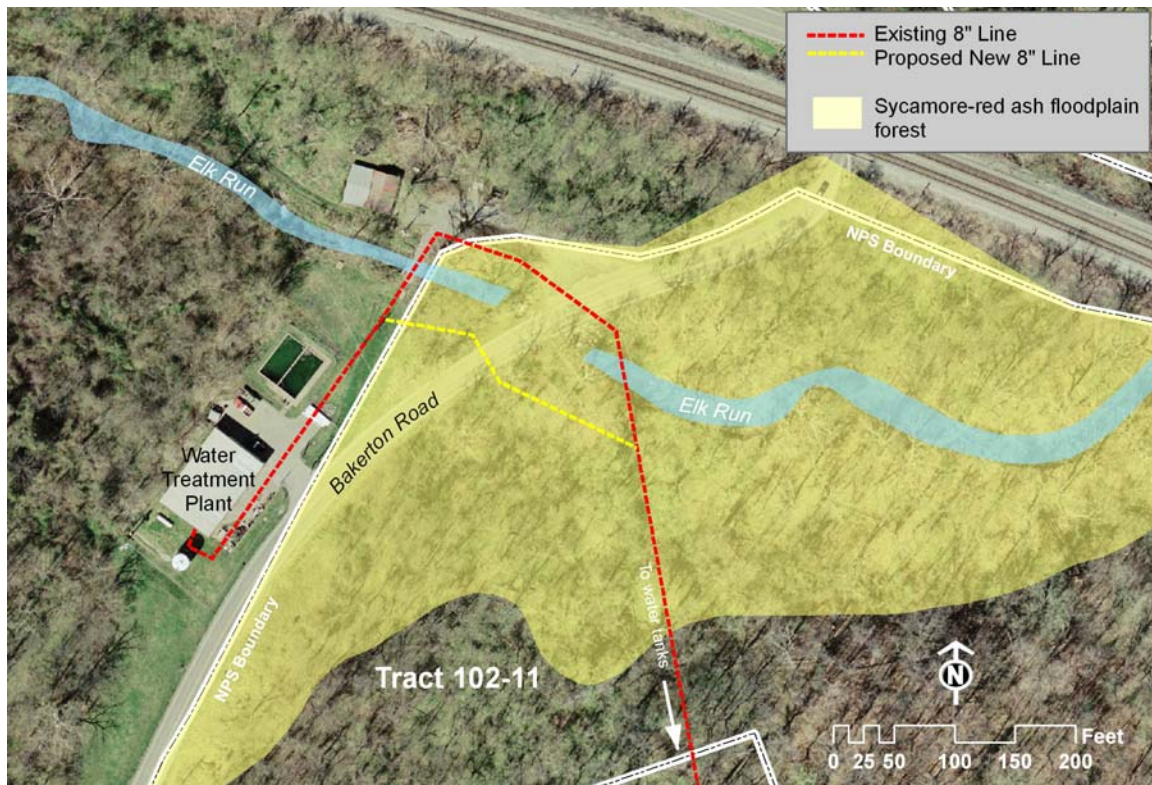


Figure 6: *Vegetation in the Project Area*

Wildlife

Harpers Ferry is home to a highly diverse animal community of insects, reptiles, amphibians, birds and mammals. Habitat types include riparian zones, agricultural fields, upland forests, developed areas, wetlands and floodplains, geologic exposures

and rare limestone glades. The project area is approximately 0.10 acres; however, the area where wildlife are likely to occur is in the floodplain forest east of Bakerton Road containing about 0.07 acres.

Wildlife that are likely to pass through the wooded area include; white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginianus*), squirrel (*Sciurus sp.*), chipmunk (*Tamias striatus*), and fox (*Vulpes vulpes*). A variety of birds, reptiles and amphibians are likely to pass through the site as well.

Soils

The project area is situated in a level floodplain area south of Elk Run and is in the Benevola-Frankstown-Braddock Soil Association (Fig. 7). Soils in the association are deep, fine-textured to medium-textured soils, formed in material weathered from limestone. The limits of disturbance for this project are located within the soil map unit **Ln**: Linside silt loam. This is a nearly level soil that forms in alluvium along permanent streams washed from limestone uplands. Flooding is moderate to severe and scouring occurs in some areas. The surface layer is approximately 10 inches thick. The subsoil extends to a depth of 36 inches.

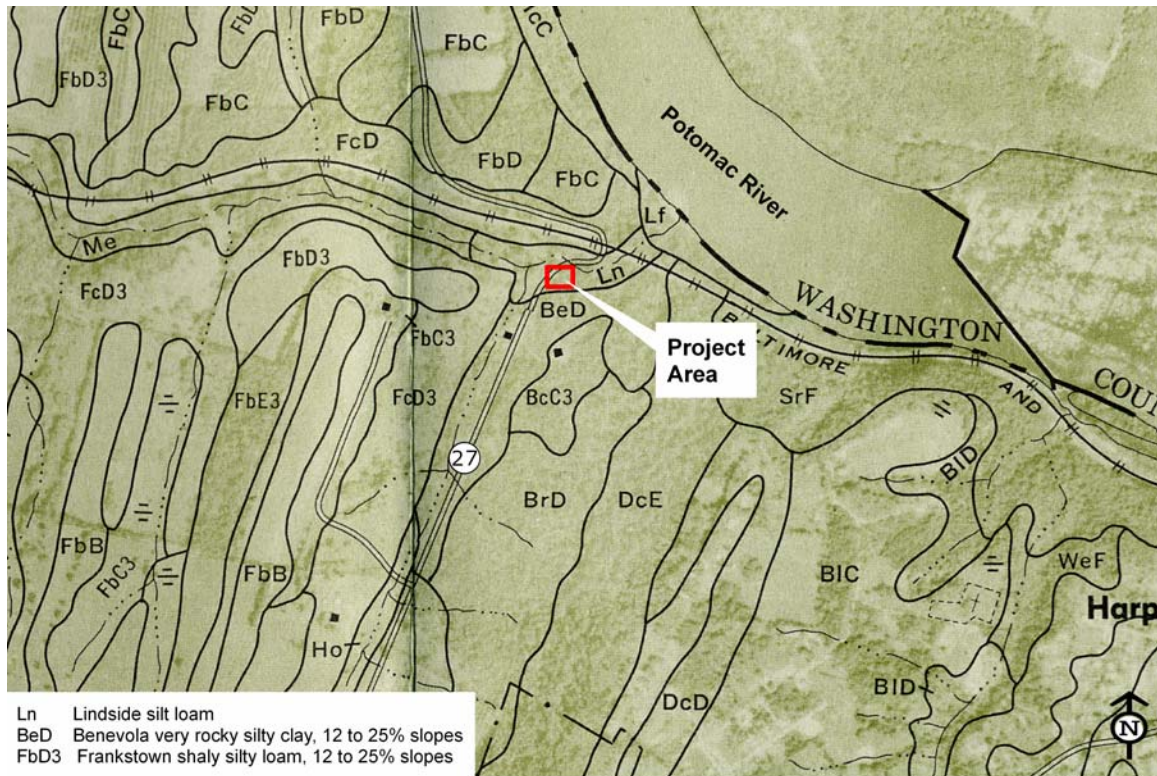


Figure 7: Soils in the Project Area

Geology

The project is situated within the Valley and Ridge Province at an elevation of 290 feet above mean sea level. The project area is underlain by the Tomstown Geologic Formation that is composed of Cambrian Age, gray-buff dolomite with minor thin-bedded limestone and dolomite and blended black chert in the upper portion of the formation (Fig. 8). It is moderately erosion resistant and is known for sinkholes and caves. The entrance to the John Brown Cave is located approximately 1,000 feet east along the CSX Railroad.

Dolomite and limestone typical of this area are carbonate rocks that are highly soluble and may form a karst terrain often marked by underground drainages. These underground drainages (caves) are pathways for surface and ground-water drainage through the watershed. Sinkholes can develop in karst terrain creating direct, unfiltered pathways for surface water flow into subterranean systems. As such, karst systems are very vulnerable to ground water pollution. The nearest documented sinkholes are located west of the project site in the Elk Run Residential Subdivision.

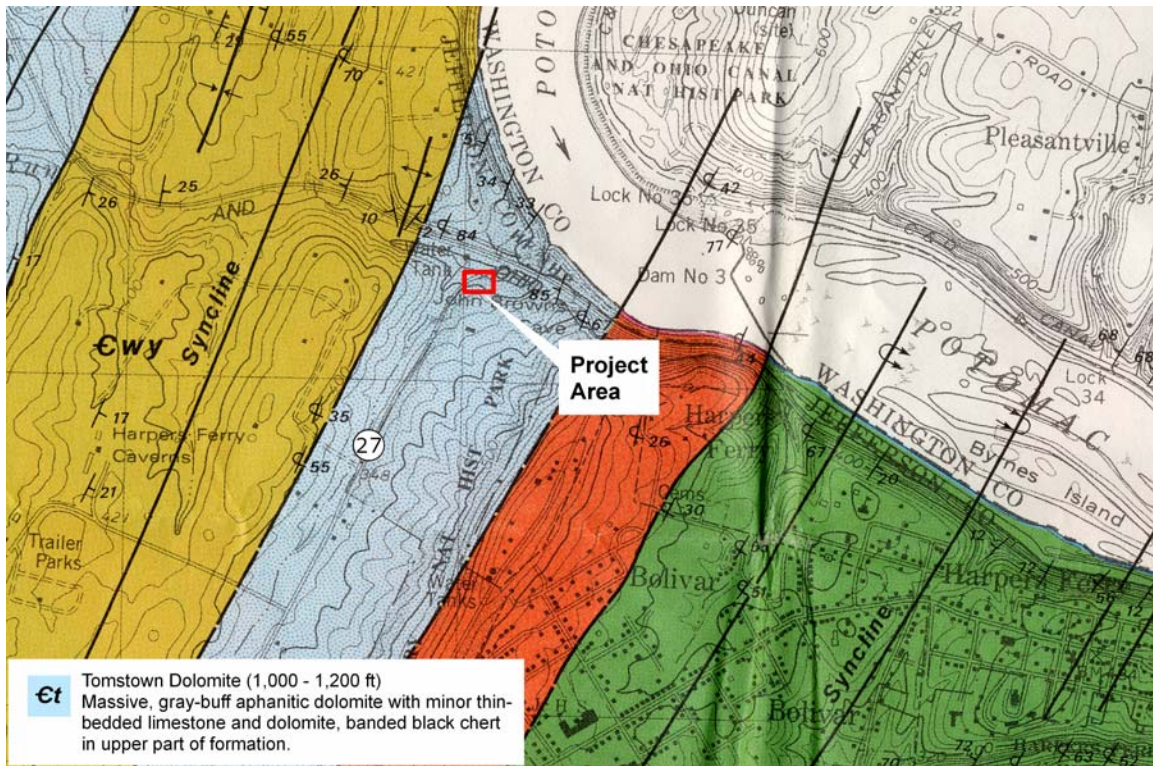


Figure 8: *Geology of the Project Area*

4.0 ENVIRONMENTAL CONSEQUENCES

Methods and Assumptions for Analyzing Impacts

The impact analysis and the conclusions in this chapter are based on a review of existing literature, information provided by experts in the National Park Service, and professional judgment. Director's Order 12, "Conservation Planning, Environmental Analysis, and Decision Making," presents an approach to identifying the duration (short or long term), type (adverse or beneficial), and intensity or magnitude (e.g., negligible, minor, moderate or major) of the impact(s). That approach is used in this document.

Cumulative impact analysis is addressed under each resource topic and describes the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other action.

Intensity of Impact

Vegetation

Analysis of the potential intensity of impacts to vegetation was derived from the available information regarding natural systems and vegetation of the park. The thresholds of change for the intensity of impacts to vegetation are defined as follows:

Negligible: Impacts on vegetation would not be measurable. The abundance or distribution of individuals would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.

Minor: An action would not necessarily decrease or increase the area's overall biological productivity. An action would affect the abundance or distribution of individuals in a localized area but would not affect the viability of local or regional populations or communities.

Moderate: An action would result in a change in overall biological productivity in a small area. An action would affect a local population sufficiently to cause a change in abundance or distribution, but it would not affect the viability of the regional population or communities.

Major: An action would result in an overall change in biological productivity in a relatively large area. An action would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population or communities would not be likely to return to its former level (adverse), or would return to a sustainable level (beneficial). Important ecological processes would be altered.

Wildlife

Analysis of the potential intensity of impacts to wildlife was derived from the available information regarding natural systems and wildlife in the park. The thresholds of change for the intensity of impacts to wildlife are defined as follows:

Negligible: The impact would not be measurable on individuals, and local populations would not be affected.

Minor: An action would affect the abundance or distribution of individuals in a localized area but would not affect the viability of local or regional populations.

Moderate: An action would affect a local population sufficiently to cause a minor change in abundance or distribution but would not affect the viability of the regional population.

Major: An action would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population would not be likely to return to a sustainable level (beneficial), or would not return to a sustainable level (adverse).

Soils

Predictions about site impacts were based on knowledge of impacts on natural resources from construction activities under similar conditions. The following categories were used to evaluate the potential impacts on soils.

Negligible: The impact on soil resources would not be measurable. Any effects on productivity or erosion potential would be slight.

Minor: An action would change a soil's profile in a relatively small area, but it would not appreciably increase the potential for erosion of additional soil.

Moderate: An action would result in a change in quantity or alteration of the topsoil, overall biological productivity, or the

potential for erosion to remove small quantities of additional soil. Changes to localized ecological processes would be of limited extent.

Major: An action would result in a change in the potential for erosion to remove large quantities of additional soil or in alternations to topsoil and overall biological productivity in a relatively large area. Important ecological processes would be altered, and landscape-level changes would be expected.

Geology

Information on geology was analyzed based on existing information and review by subject matter experts. The following definitions were used to qualify the severity of impacts from implementing the alternatives.

Negligible: Effects of an action on geologic features may occur but would not be measurable and would be confined to a relatively small area.

Minor: Effects on geologic features would be detectable but slight, and the area affected would be small.

Moderate: Effects on geologic features would be readily apparent and slightly change the characteristics or features over a relatively large geologic system.

Major: Effects on geologic features would be readily apparent and would substantially change the geologic, hydrologic, or ecologic characteristics over a large area in and out of the national historical park.

Impairment of National Park Resources

In addition to determining the environmental consequences of implementing the alternatives, NPS Management Policies 2001 (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair national historical park resources and values. While the NPS has discretion to allow certain impacts within a park, that discretion is limited by statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The determination of impairment is described under the Conclusion section of each resource topic below. When it is determined that an action(s) would have a moderate to major

adverse effect, justification for a finding of non-impairment is made. Impacts of negligible or minor intensity would by definition not result in impairment.

Impacts of Alternative A - No Action

Vegetation

The no-action alternative would not affect the vegetation or land cover in the project area. The existing vegetation and forested land would remain undisturbed. However, if the line fails or is breached resulting in a release of chlorinated water into the stream, there would be localized, short-term, negligible adverse impacts on aquatic vegetation.

Cumulative Effects – A variety of past, present, and reasonably foreseeable future actions have had long-term, minor to moderate adverse impacts on vegetation. Typical effects associated with storm events, heavy winds, wildlife feeding, flooding, forest insect infestations and droughts are anticipated to occur. The effects of this alternative would not contribute to the regional cumulative effects on vegetation. Even if a failure occurs, the impacts on the region's vegetation would be localized, short-term and negligible.

Conclusion - There would be no new impacts to the vegetation or forested land within the project area. If the line fails or is breached resulting in a release of chlorinated water into the stream, the impacts would be localized, short-term and negligible; therefore, there would be no impairment to this resource.

Wildlife

The no-action alternative would not have an effect on wildlife populations or their habitat. Existing conditions and situations would continue. There would be no changes in the current status of wildlife communities either in terms of species composition or population dynamics other than those brought about by natural environmental processes.

However, if the line fails or is breached resulting in a release of chlorinated water into the stream, there would be localized, short-term, negligible adverse impacts on aquatic wildlife.

Cumulative Effects – Actions affecting wildlife are occurring in the region as a result of agriculture, hunting, weather, vehicle traffic, water treatment plant operations, and urban development. Actions taken on adjacent lands can disrupt or fragment habitat, displace individuals or otherwise cause stress to animals causing long-term, minor to moderate adverse impacts on wildlife populations. Incremental development of the region has affected the abundance and diversity of wildlife by changing the capacity of habitats to support wildlife. Extreme weather events including flooding have affected wildlife populations and their habitats.

The effects of this alternative would not contribute to the regional cumulative effects on aquatic wildlife. Even if a failure occurs, the cumulative impacts on the region's aquatic wildlife would be localized, short-term and negligible. Dilution of chlorinated water would lessen the impact on aquatic wildlife in the River.

Conclusion - Implementation of this alternative would have no effect and there would be no cumulative impacts to aquatic wildlife populations. If the line is breached or fails resulting in a release of chlorinated water into the stream, the impacts would be localized, short-term and negligible; therefore, there would be no impairment to this resource.

Soils

Under the no-action alternative, the main waterline would not be relocated; therefore, there would be no ground disturbance within the project area. Soils would continue under current land use, either undisturbed in the forested area or maintained by Water Works personnel in the vicinity of the Treatment Plant.

The same situation exists as stated in the previous impact topics if the line is breached or fails. Chlorinated water would have a localized impact that is short in duration, negligible in intensity and adverse in impact.

Cumulative Effects – Impacts from a variety of past, present, and reasonably foreseeable actions have had short- and long-term, minor to moderate adverse impacts on soils and will continue to impact soils in the region. Typical soil effects

associated with urban development, weather, flooding, surface water run-off, and highway construction and maintenance will continue.

The effects of this alternative would not contribute to the regional cumulative effects on soils. If a failure or breach occurs, the cumulative impacts on the region's soils would be localized, short-term and negligible.

Conclusion - Implementation of this alternative would have no cumulative effect. If a failure or breach occurs, the adverse impacts would be localized, short-term and negligible; therefore, no impairment to soils would occur.

Geology

The no-action alternative would not create any changes to current conditions or situations affecting geologic resources and hydrologic systems. If a breach or failure occurs in the exposed line resulting in a release of chlorinated water into the stream, water quality would be adversely impacted, however, it would be localized to the short portion of the stream from the breach to terminus of the stream where it empties into the Potomac River. The impacts on water quality would be short-term and negligible.

Cumulative Effects – Past, present and reasonably foreseeable future activities have had short- and long-term, minor to moderate adverse impacts to geologic features and hydrologic systems. Natural and human-caused effects associated with urban development and other construction-related activities, highways, railroads, quarry operations, agriculture, and weather, including drought, will continue.

This alternative would not contribute to the regional cumulative effects on geologic features or hydrology systems. If a failure or breach occurs, the cumulative impacts would be localized, short-term and negligible.

Conclusion - This alternative would not create any additional impacts on this resource. If a failure or breach occurs, the adverse impacts would be localized, short-term and negligible; therefore, there would be no impairment.

Impacts of Alternative B - Preferred Alternative

Vegetation

The area of disturbance under this alternative is approximately 0.10 acres occurring mostly in the forested area east of Bakerton Road. Understory vegetation in forested and maintained areas within the corridor of the two-foot wide trench and construction area approximately four-feet on each side of the trench would be damaged as a result of construction activities. Silt fences would be installed along the border of the project area to prevent (erosion) the movement of any soil particles from moving outside of the work area. In addition, the disturbed area would be mulched with straw to reduce surface water run-off. No seeding would be undertaken as this may cause introduction of non-native grasses or other undesirable plants. Regeneration of vegetation would occur naturally from surrounding undisturbed forested lands. No mature trees would be removed. Root pruning will be required to protect the root systems of adjacent mature trees.

Cumulative Effects – Cumulative effects from the installation of the water line would include a short-term, negligible local loss of understory plant species. Regeneration of vegetation within the disturbed area from adjacent undisturbed forests is likely to occur within one or two years.

Conclusion - The preferred alternative would have a short-term, negligible adverse effect on vegetation; therefore, there would be no impairment to this resource.

Wildlife

There are no federal and state listed wildlife species within or immediately adjacent to the project area. Based on field observations, it is mostly uninhabited floodplain forest land. There may be wildlife species associated with the floodplain forest that pass through, rest or feed in the project area. Wildlife within or near the project site may be disrupted because of construction activities resulting in short-term, negligible adverse impacts.

Cumulative Effects –On a regional scale, wildlife have been impacted by agriculture and incremental urban development

which has fragmented wildlife habitats, displaced individuals or otherwise caused stress to animals. Wildlife is slowly becoming more restricted by current land uses, increasing development and human activity, causing individuals to populations to either adapt or move. This has resulted in short- and long-term, minor to moderate adverse impacts.

Conclusion - Implementing this alternative would have short-term, negligible adverse impacts to wildlife during construction. Given the limited scope of the project and relatively small project area, wildlife are likely to return to the site soon after construction has ended. No impairment of any wildlife species would occur.

Soils

Installation of the water line will disrupt approximately 0.05 acres of soils. Soils that have been removed will be used as backfill. During the project, soils will be exposed to the erosional forces of wind and water until vegetation recovers. Stability of the surface layer of soil will be achieved through natural seeding from adjacent undisturbed lands. Mitigating measures such as silt fences will be installed to reduce the effects any soil erosion potential.

Cumulative Effects – Soils in the region have been disrupted by commercial, residential, and agricultural development and use over the last two centuries. Foreseeable future actions of further development in the vicinity of the park would adversely impact soils through compaction and displacement from construction activities. Such actions lead to long-term, moderate adverse impacts.

This alternative would contribute a localized, negligible adverse impact and combined with other past, present and foreseeable future actions would have a negligible adverse cumulative effect on the soil resource.

Conclusion - The impacts of implementing this alternative would be short term, negligible and adverse. There would be no impairment of this park resource as a result of this alternative.

Geology

The underlying geology within the project area is Tomstown dolomite which is a carbonate rock that is moderately soluble and may form karst terrain as a result of the dissolution of the bedrock. Karst features (exposed dolomite and/or limestone, sinkholes, cave entrances) along the proposed alignment of the water line were not observed during several visits to the project site; however, surface rock exposures were visible on adjacent slopes. Although the installation is likely to be limited to the depth of the soil which is estimated to be 4-6 feet, it is possible that the upper surface of bedrock may be encountered during trenching operations. If encountered, trenching through bedrock would be negligible given the 1,000-1,200-foot thickness of Tomstown dolomite, and would not be expected to impact subterranean ecosystems typical in karst terrain. If bedrock features are encountered, the impacts would be long-term, negligible, and adverse.

Cumulative Effects – Past, present and reasonably foreseeable future activities have impacted the underlying geology and its associated surface and subsurface ecosystems. Natural and human-caused effects associated with urban development and other construction-related activities, highways, railroads, agriculture, quarry operations and weather, including drought, will continue. The human-caused effects result in short- and long-term, minor to moderate adverse impacts.

Conclusion - If geologic features are encountered under this alternative, the impacts would occur within a relatively small area and would have long-term, negligible and adverse effects. Therefore, there would be no impairment of this resource.

5.0 CONSULTATION AND COORDINATION

In a letter dated May 10, 2006, the Superintendent of the Harpers Ferry Water Works, which is owned and operated by the Corporation of Harpers Ferry, Harpers Ferry, West Virginia, requested permission of the National Park Service to relocate a portion of the main water supply line in the vicinity of the Water Treatment Plant on Bakerton Road. NPS staff reviewed the project onsite with employees of the Water Works to discuss the requirements of the project and to identify the proposed relocation of approximately 200 feet of the 8-inch supply line. In a letter dated September 22, 2006, the NPS informed the Mayor of Harpers Ferry that an environmental assessment would be

undertaken to address the cultural and natural resource impacts of the project. The park's Archeologist and the NCR Regional Hydrologist were consulted. Onsite visits were completed in November and December to address cultural and natural issues.

The public was informed of the proposed project in an article in the park's October 2006 Community Bulletin. The article requested the public to forward concerns that should be addressed in the EA to the park's Natural Resource Manager. No comments were received.

The draft EA was prepared by the park's Natural Resource Program Manager in November-January and reviewed by the park's Management Team and Regional Hydrologist in January 2007. In the February 2007 Community Bulletin, the park informed the public of the availability of the Draft EA for a 30-day public review from January 30 to February 28. Public comments, if relevant and appropriate, will be incorporated in the final EA.

6.0 APPENDICES, SELECTED REFERENCES, PREPARERS AND CONSULTANTS

Appendices

- Environmental Screening Form
- October 2006 and February 2007 Community Bulletins
- Map of Project Area
- Harpers Ferry Water Works Request to Reroute Water Main

Selected References

Bartgis, Rodney L. and J. Christopher Ludwig
1996 *Rare Plant Survey, Harpers Ferry National Historical Park*.
Maryland Natural Heritage Program and Virginia Division of
Natural Heritage in co-operation with the West Virginia
Natural Heritage Program.

Comprehensive Plan Working Group
2006 *Town of Harpers Ferry Draft Comprehensive Plan*

Fleming, Cris
1999 *Rare Plant Survey of Harpers Ferry National Historical
Park*. The Nature Conservancy of West Virginia.

National Park Service, Harpers Ferry National Historical Park
2003 *Flood Emergency Response Plan*

National Park Service
2001 *Management Policies*.

Pauley, Dr. Thomas K., Dr. Michael Watson, and Dr. Joseph Mitchell
2005 *Final Report: Reptile and Amphibian Inventories in Eight Parks of the National Capitol Region*.

Rouse, Garrie
1998 *Checklist of the Vascular Flora of Harpers Ferry National Historical Park, Harpers Ferry, West Virginia*.

U.S. Department of Agriculture, Soil Conservation Service
1973 *Soil Survey of Jefferson County, West Virginia*.

Vanderhorst, Jim
2000 *Plant Communities of Harper's Ferry National Historical Park: Analysis, Characterization, and Mapping*.
West Virginia Natural Heritage Program
West Virginia Division of Natural Resources

West Virginia Geological and Economic Survey
1987 *Geology of the Hedgesville, Keedysville, Martinsburg, Shepherdstown, and Williamsport Quadrangles, Berkeley and Jefferson Counties, West Virginia*. Map-WV31.

Preparers and Consultants

Bill Hebb, Natural Resource Program Manager, HFNHP

Mia Parsons, Supervisory Archeologist and Section 106 Coordinator, HFNHP

Doug Curtis, Hydrologist, Natural Resources and Science, National Capital Region