

SECTION 14
EMERGENCY STREAMBANK PROTECTION PROJECT
KANAWHA RIVER 35TH STREET TO GREENBRIER STREET
CITY OF CHARLESTON, WV

DRAFT
ENVIRONMENTAL ASSESSMENT
&
PLANNING DESIGN ANALYSIS



US Army Corps
of Engineers ®
Huntington District

November 2012

Table of Contents

1. Introduction.....	- 2 -
2. Authorization	- 3 -
3. Purpose and Need	- 3 -
4. Proposed Action and Alternatives.....	- 4 -
4.1. Alternatives Retained for Further Consideration	- 4 -
4.2. Alternatives Dismissed from Further Consideration.....	- 5 -
5. Geographical Aspects	- 6 -
5.1. Location	- 6 -
5.1. Physical Features	- 6 -
5.1. Climate.....	- 6 -
6. Existing Conditions and Impacts of Proposed Action.....	- 7 -
6.1. Cultural Resources	- 7 -
6.2. Recreation Resources.....	- 9 -
6.3. Aesthetic Resources	- 10 -
6.4. Aquatic Resources	- 10 -
6.5. Terrestrial Resources	- 11 -
6.6. Threatened and Endangered Species.....	- 11 -
6.7. Wetlands	- 12 -
6.8. Noise	- 12 -
6.9. Air Quality	- 13 -
6.10. Hazardous, Toxic and Radioactive Waste (HTRW).....	- 15 -
6.11. Environmental Justice	- 15 -
6.12. Traffic and Navigation.....	- 16 -
6.13. Floodplain Management	- 17 -
6.14. Cumulative Effects.....	- 17 -
7. Hydraulic Analysis.....	- 19 -
8. Economic Costs and Justification for Proposed Action Alternative.....	- 20 -
9. Real Estate.....	- 22 -
10. Public and Agency Coordination.....	- 22 -
11. References.....	- 25 -

APPENDICES

Appendix A – Project Plans

Appendix B – Engineering Analysis of Stair Features

Appendix C – Project Coordination and Comments

Appendix D – Mailing List

Appendix E – Notice of Availability

Appendix F – Baseline Cost Estimate

Draft Environmental Assessment and Planning Design Analysis
Section 14 Streambank Protection Project - Kanawha River 35th Street to Greenbrier Street

Summary

This draft Environmental Assessment and Planning Design Analysis has been prepared in compliance with agency policy as defined in ER 1105-2-100, as well as applicable statutes and executive orders to identify the most cost-effective project alternative while minimizing environmental, economic and social impacts that may result from the proposed streambank protection project located along the Kanawha River in Charleston, West Virginia. Recent high water events have resulted in imminent endangerment of a 5,325 foot reach along U.S. Route 60 (Kanawha Boulevard) between the 35th Street Bridge and Greenbrier Street. Flood flow erosion and recession related piping of fill and alluvial soil have resulted in extensive stone and fill displacement as well as bank failure and retreat. Within this critical reach of Kanawha Boulevard the bank erosion and resulting stone displacement has caused failure features which extend from the river, to the lower and upper bank recreational pathways and Kanawha Boulevard. The Proposed Action Alternative would place granular bedding, filter material, and a stone blanket on top of the existing stone located on the lower bank slope.

The existing stone treatment was constructed in the late 1930's and is associated with a Public Works Administration (PWA) project. The PWA was formed by the National Industrial Recovery Act on June 16, 1933 as a New Deal program to provide employment, stabilize purchasing power, improve public welfare and revive American industry. Due to the projects association with PWA, the West Virginia State Historic Preservation Office (WVSHPO) has determined that Kanawha Boulevard and its contributing elements are eligible for the National Register of Historic Places. The proposed alternative will result in a significant adverse effect to this resource and would require mitigation to minimize its effect. The USACE is consulting with the City of Charleston, West Virginia State Historic Preservation Office, and local groups. It is anticipated a Memorandum of Agreement will be executed between the USACE, the City of Charleston, and WVSHPO to mitigate the adverse effect. Therefore, no significant environmental effects would be expected from the Proposed Action Alternative

For further information, contact:

Jonathan J. Aya-ay
Chief, Environmental Analysis Section
U.S. Army Corps of Engineers, Huntington District
502 Eighth Street
Huntington, WV 25701

Telephone: (304) 399-5276

Fax: (304) 399-5136

Email: Jonathan.J.Ayaay@usace.army.mil

1. Introduction

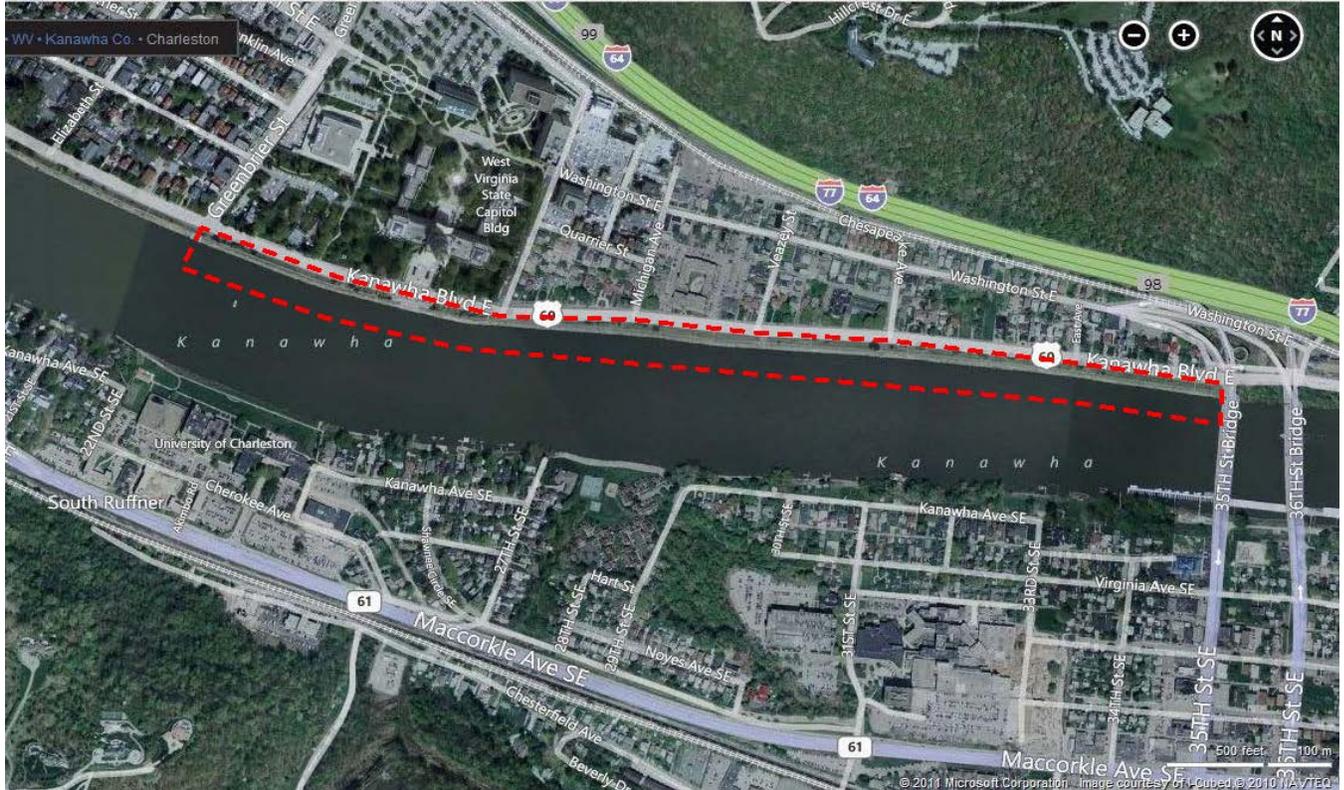
The project area is located within the City of Charleston, West Virginia, along the right descending bank of the Kanawha River. The project area includes: existing stone treatment on the lower riverbank, three combined sewer overflow outfalls, ten storm water outfalls, a lower recreational pathway located midway up the riverbank slope and approximately 30 feet (ft) above the normal pool level, an upper recreational pathway located at the top of the bank adjacent to U.S. Route 60 (Kanawha Boulevard) and nine sets of stone stairs which provide access between the upper and lower pathway and the River.

The existing stone treatment was constructed in the late 1930's and is associated with a Public Works Administration (PWA) project. The PWA was formed by the National Industrial Recovery Act on June 16, 1933 as a New Deal program to provide employment, stabilize purchasing power, improve public welfare and revive American industry. This program was short lived, ending in 1939. Throughout the program's short history, it spent approximately \$4 billion dollars on large scale construction projects ranging from education facilities to bridges and sewage treatment plants throughout the nation

(<http://www.britannica.com/EBchecked/topic/482574/Public-Works-Administration-PWA>).

The PWA dredged fine silts and sands from the River, placed the material on the steep riverbank, and then stabilized the area with derrick stone (stone with special shape and size resulting from the method of production). Over time groundwater flow has washed the fine material through the large openings in the stone in a process referred to as "piping", which has compromised the original treatment. In addition, frequent high water and flood events re-work and further erode the fill material causing slope failures and displacement of the overlying stone. This erosion and recession has resulted in the endangerment of a 5,325 ft reach of Kanawha Boulevard between the 35th Street Bridge and Greenbrier Street.

Figure 1: Project Location



2. Authorization

The study is being conducted under authority of Section 14 of the Rivers and Harbors Act of 1946, as amended (PL79-526). The Act authorizes the U.S Army Corps of Engineers (USACE) to plan and construct emergency streambank and shoreline protection projects to protect endangered highways, highway bridge approaches, and public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities. Under this authorization, the total project cost is shared between the Federal (65%) and Non-Federal sponsor (35%).

3. Purpose and Need

The purpose of this project is to provide a cost-effective means to prevent damage to Kanawha Boulevard. A 5,325 foot reach of Kanawha Boulevard, located adjacent to the Kanawha River is in danger of eventual failure. Flood flow erosion and recession related piping of fill and alluvial soil have resulted in extensive stone and fill displacement, as well as bank failure and retreat. Within this critical reach of Kanawha Boulevard, the bank erosion has resulted in failure features which extend from the River to the existing lower and upper pathways and Kanawha Boulevard. This project is needed because of continued failure and erosion in this area would eventually lead

to closure of Kanawha Boulevard, which is a critical contributing element to the Kanawha Boulevard Historic District as well as a principle arterial highway servicing approximately 15,000 vehicles per day providing access to area residents and businesses.

4. Proposed Action and Alternatives

4.1. Alternatives Retained for Further Consideration

Toe of Slope Stone Blanket (Proposed Action Alternative)

Requirements for the construction of this plan (Appendix A) include the placement of granular bedding, filter material, and a stone blanket on the derrick stone (4' x 4' x 6' stone) and hydraulic fill located on the lower bank slope. The treatment would be approximately 5,325 feet long and extend approximately 23 feet up the bank to a paved recreational pathway. The lateral extent of treatment would occur from Greenbrier Street and would stop shortly before the 35th Street Bridge abutment. Durable limestone would be placed over the derrick stone with bedding/filter material on the lower bank slope. Sandstone was initially considered as a cheaper alternative to limestone with the preferred alternative; however, the locally available sandstones did not have the desired chemical composition necessary for resistance to abrasion and long term, in place durability. Therefore commercial limestone sources were tested and determined to be satisfactory as filter material and for stone slope protection. These limestone sources have been used by the District since 1922 and have a well established record on in place resistance to weathering.

The commercial limestone would have an approximate maximum size of 18 inches, and the treatment would be three feet thick. Storm sewer drains would be extended with collar adapters and HDPE pipe through the stone blanket and downslope. Headwalls with grouted stilling features would be installed at the end of each storm drain extension. Up and downriver transitions would be constructed to prevent the outflanking of treatments. The lower bank stairs would be removed in order to avoid leaving discontinuities in the bank protection. The sandstone block stairs would be removed and stored by the City of Charleston (City) for later use. Within disturbed areas adjacent to stone placement areas, a filter fabric, topsoil, and native grass seed mix would be placed to prevent erosion. The estimated cost of this alternative is \$2,222,000 (fully funded total project cost, Price Level FY 2013). This alternative is considered the least-cost alternative per USACE policy guiding Section 14 formulation (ER 1105-2-100, Appendix F).

No Action Alternative

For the No Action Alternative, USACE would not provide streambank stabilization for Kanawha Boulevard along the right descending bank of the Kanawha River between Greenbrier Street and

the 35th Street Bridge. Erosion and bank failure would continue, and would extend upslope to the roadway, unless stabilization treatments are installed. It is reasonable to expect that some efforts would be taken by the City or other entities to stabilize the bank. These efforts would most likely address small areas of erosion individually. However, these limited stabilization projects do not effectively address erosion and recession related piping of fill and alluvial soil and would allow for continued stone and fill displacement, bank failure and retreat with eventual failure of Kanawha Boulevard. The Boulevard serves as a principal arterial route and eventual failure would result in increased traveling times as traffic would be required to reroute along secondary streets.

4.2. Alternatives Dismissed from Further Consideration

Relocation of Highway and Utilities

This alternative consists of the relocation of existing recreational pathways and Kanawha Boulevard. Relocation would include acquisition of real estate and relocation of utilities. Cost for relocation is estimated to be approximately \$10,000,000. This alternative would maintain the utility of Kanawha Boulevard to traffic but may adversely affect its historic integrity and at substantially higher cost; therefore, it does not meet the cost-effectiveness objective of the project and was removed from further consideration.

Gabions

Gabion baskets which are rectangular baskets made of steel wire filled with stone four to eight inches in diameter, closed and secured. The gabions would be placed on a filter and underlying granular bedding material and hydraulic fill. The gabion structures would be keyed-in at the toe and the top of the bank and at transitions. This would require excavating trenches along the length and at up and down stream limits of the lower bank to be protected. The estimated cost of this alternative is \$5,022,345. This alternative is more costly than the proposed action alternative, is expected to result in greater environmental effects due to excavation and offers similar utility as the recommended alternative. Therefore, this alternative was removed from further consideration.

Top of Bank Stone Blanket

Stone placement from the Kanawha River to Kanawha Boulevard was evaluated. This alternative would cost approximately \$4,142,325. Initially, there were concerns with respect to the upper bank stability, however, upon review by District engineering personnel, it was determined that maintenance of the existing vegetative cover would provide sufficient slope protection along the upper bank, therefore this alternative was removed from further consideration.

Vegetative Cover

Vegetative treatments cannot be implemented at this site due to continuing failures and erosion occurring along the riverbank. Persistent groundwater seeps and frequent pool fluctuations preclude the establishment of vegetative treatment within defined limits. Vegetative treatment will not address piping occurring within the hydraulic fill behind the derrick stone. A filter is necessary to retain the hydraulic fill within the bank and vegetation roots do not provide filtering characteristics. Additionally placement of vegetation within the limited openings between the existing derrick stone would limit vegetation establishment and has resulted in dieback of volunteer vegetation. Excavating to stable slope geometries to allow placement of vegetation would require the relocation of the existing recreational pathways and Kanawha Boulevard, would not be cost effective, and would not result in sufficient stability. Therefore, this alternative was removed from further consideration.

5. Geographical Aspects

5.1. Location

The project is located on the right descending bank of the Kanawha River adjacent to U.S. Route 60 (Kanawha Boulevard) in Kanawha County, West Virginia at approximately 38.334719° latitude and -81.607407° longitude. The area is located within the Winfield Navigation pool between river mile (RM) 60 and 61. The normal pool elevation is 566 feet above mean sea level (ft-msl). The Ordinary High Water Elevation is approximately 576.5 ft-msl.

5.2. Physical Features

Charleston, West Virginia, is located within the Kanawha Section of the Appalachian Plateaus Province. The Appalachian Plateaus are characterized by relatively flat-lying but intensely eroded bedrock, which results in a mountainous terrain capped by resistant layers of bedrock with a dendritic drainage pattern. Charleston is located within the Kanawha River Basin which drains approximately 8,424 square miles (mi²) in West Virginia.

5.3. Climate

Charleston, West Virginia, is located in the continental long summer climate region, having approximately 44 inches of annual precipitation with a mean annual temperature of 55°F.

6. Existing Conditions and Impacts of Proposed Action

6.1. Cultural Resources

In order to resolve the USACE's obligations under Section 106 of the National Historic Preservation Act (NHPA) of 1966 (U.S.C. 470[f]), the USACE has considered effects the Proposed Action Alternative would have on historic properties. The following determinations of effects are provided for review and comment.

Kanawha Boulevard, the existing stone slope protection, the upper and lower pathways, and stairs were built in 1938 by the PWA. Due to the projects association with PWA, the West Virginia State Historic Preservation Office (WVSHPO) has determined that Kanawha Boulevard and its contributing elements are eligible for the National Register of Historic Places (NRHP) under Criteria A and C. Projects constructed under this program did not require maintenance and no agreements were effected with local interest, therefore the existing stone slope protection and lower stairs are currently failing and in disrepair. Their condition is expected to continue deteriorating unless a curative action is applied.

The Proposed Action Alternative would protect the original stone slope protection through encapsulation with a new stone blanket. Throughout the life of the original treatment, water has been unable to freely discharge from underneath the stairs causing pressure to degrade and misalign the stairs as well as create voids and subsequent instability in the surrounding stone slope protection. A prior stone slope protection project from Patrick Street to Magic Island reconstructed two (2) sets of the original eleven (11) PWA stairs on top of the new stone blanket. The prior project also constructed five (5) benches along the lower pathway from repurposed stairs to mitigate for adverse effects associated with stair removal. Upon review of the previously constructed stairs by District engineering personnel, water discharge constraints were noted which are resulting in the same misalignment and void formation leading to subsequent instability in the new stone slope protection. An engineering analysis has been completed for both the existing stairs and the reconstructed stairs and included in Appendix B. Consequently, the Proposed Action Alternative does not include reconstruction of the original stairs. The proposed stair elimination results in an adverse effect to a contributing element of the NRHP eligible Kanawha Boulevard.

Figure 2: Deteriorating stone stairs located on lower bank



The adverse effect has been coordinated with the WVSHPO and local groups as summarized in Appendix C. Based upon this coordination, groups agree all of the original stairs cannot be rebuilt and mitigation is necessary. The WVSHPO has requested additional information prior to moving forward with mitigation, but concurs with the adverse effect determination. Additional information has been provided and is currently under review. The Kanawha Valley Historical & Preservation Society, Inc. expressed concerns related to visual impacts and prefers to have three (3) of the original lower stairs rebuilt.

The USACE continues to consult with the City of Charleston, WVSHPO, and local groups to mitigate the adverse effect to the original, NRHP eligible, PWA stairs. It is anticipated a Memorandum of Agreement (MOA) will be executed between the USACE, the City of Charleston, and WVSHPO to resolve the adverse effect. The USACE's proposed mitigation would repurpose a minimum of five (5) and a maximum of ten (10) stairs as benches along the lower pathway. An interpretative sign would also be placed along Kanawha Boulevard with a brief history of the PWA and their role in the creation of Kanawha Boulevard and its contributing elements. The remaining stairs would be stockpiled by the City for future use. The proposed mitigation has been included in overall project costs and final mitigation will be incorporated in the final design. While responses received to date agree all of the original stairs

cannot be rebuilt, the USACE will continue to work with interested parties to find acceptable mitigation that does not compromise the new stone slope protection.

There are no known archeological resources located within the project area, but the presence of buried archeological sites would be expected. The proposed project would encapsulate any archeological material below the lower pathway thereby preserving any archeological sites.

The No Action Alternative would allow the existing stone slope protection and stairs to deteriorate. Eventually, sections are anticipated to be lost to erosion and bank failure further endangering NRHP eligible Kanawha Boulevard and its contributing elements. Stabilization and repair efforts could be undertaken by the City or another local entity to repair unstable reaches. It is likely that these individual efforts would not be uniform in composition or placement, may create an inconsistent appearance throughout the reach, and could also result in an adverse effect to cultural resources.

6.2. Recreation Resources

The project site includes two recreational pathways, upper and lower, running parallel to the River and nine sets of stone stairs which provide access between the upper and lower pathway and the River. The pathways can be used for walking, running and biking and the lower stairs can be used to access the River in order to fish, boat, swim, etc. During construction, the pathways will be closed for safety reasons. The closures will be segmented as construction progresses, so they will not be completely inaccessible for the full duration of construction. There will be a temporary loss of recreational use during construction; however, the Charleston riverfront affords approximately 3.5 additional miles of recreational pathways throughout the downtown area that would offset the temporary loss of this one mile section of recreational pathway. Implementing The Proposed Action Alternative would also improve the recreational pathways by repairing current voids and slips that have occurred.

The lower stairs are currently failing and in various states of disrepair. Erosion occurring near the stairs and storm water outfalls coincides with the locations of the most severe bank instability within the project area. The removal of the stairs is considered necessary in order to effectively place the bedding material required to stabilize and repair the riverbank. A total of nine lower stairs will be removed, reducing river access within the 5,325 linear feet (lf) project area. Public River access exists within the project area and the immediate vicinity at the stairs of the State Capitol building (RM 60), and downstream of the project at both the Magic Island and Haddad Riverfront Parks (RM 58) as well as upstream at Daniel Boone State Park (RM 61), therefore recreational impacts associated with the removal of the stairs are not considered significant.

Under the No Action Alternative some small stabilization projects would most likely be undertaken by the City or another entity to repair unstable reaches. This would lead to continuing interruptions to recreation, as well as a general decline in the quality of the recreational pathway.

Eventually, sections of the stairs and pathway are anticipated to be lost to erosion and bank failure.

6.3. Aesthetic Resources

The riverbank between the upper and lower pathways is compromised primarily of grasses with sparse ornamental tree plantings. The area between the lower pathway and the River is comprised of existing stone treatment, stairs, and sparse vegetation volunteered on and between the stone. The area can be viewed from the recreational pathways, upper and lower pathway stairs, and the opposite riverbank.

For the Proposed Action Alternative, the existing treatment would be covered with a stone blanket and the existing stairs would be removed. The new treatment would be comprised of limestone. The limestone treatment will be visually different than the current treatment and the surrounding area and may create an aesthetic impact.

Aesthetic value is an individual perception but in general, limestone treatments are associated with artificial or industrial environments. A limestone treatment might be less aesthetically pleasing to those viewing the site. However, limestone bank treatment would be consistent with the current conditions at Magic Island, located approximately two miles downstream, and would not be a significant decrease to the aesthetic quality of the site.

The No Action Alternative would allow erosion and bank failure to continue which could decrease the aesthetic value of the area. Under the No Action Alternative some small stabilization projects would most likely be undertaken to repair unstable reaches. It is likely that these repair efforts would not be uniform in composition or placement and would most likely have an inconsistent appearance throughout the reach. This inconsistency in repairs could also decrease the aesthetic value of the area. The No Action Alternative may also result in the loss of the existing stairs as they continue to misalign and degrade and may not be incorporated in small stabilization projects initiated by the City.

6.4. Aquatic Resources

The project area is part of the Winfield navigation pool. According to the Environmental Assessment completed for the Winfield Lock Replacement Project, October 2007, the Winfield pool consists primarily of a wide and deep channel with narrow benches of shallow habitat located on either side of the central channel. The riverbed channel is classified as silty sand. The shallow bench areas are typically sandy, un-vegetated bars with aquatic plants making up the minor component of the littoral (shoreline) habitat.

In general, the fish assemblages in the area reflect disturbances from the maintenance of the navigation pool, navigation, industrial, and urban impacts. Mussel surveys within the Winfield pool have located few significant mussel beds due to numerous past impacts including reduced

water quality, elimination of host fish species and habitat alteration. Generally, aquatic resources in the project reach are further limited by the urban nature of the setting and lack of riparian vegetation.

For the Proposed Action Alternative, aquatic resources would be impacted during construction due to the minimal amount of excavation that may be required and the placement of stone. An elevation in suspended sediments during construction would be expected, but would subside following the completion of construction. Therefore, the negative impacts to aquatic resources for the Proposed Action Alternative would be limited to the construction period and would be temporary in nature. The placement of the stone and the repair of the riverbank meet the criteria for a Nationwide Permit (NWP) No. 3 - Maintenance.

Under the No Action Alternative some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts to the aquatic resources as the Proposed Action Alternative, but would occur intermittently and for a shorter duration. Bank failure and retreat is expected to continue within the project reach, further degrading aquatic resources within the project area.

6.5. Terrestrial Resources

Terrestrial resources in the project area are limited by the urban nature of the reach. Terrestrial habitat on the bank between the upper and lower pathways is compromised primarily of grasses with sparse ornamental tree plantings. The area between the lower pathway and the River is mainly free of vegetation but for some limited instances of herbaceous vegetation that has volunteered between the existing stone.

The Proposed Action Alternative would involve removal of existing vegetation and would occur primarily within the existing stone treatment. Once the new stone is placed, transitional areas will be covered with soil, graded and planted in grass; therefore, impacts to terrestrial resources would be minor.

The No Action Alternative would allow for continued erosion and bank failure. Some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts to the terrestrial resources as the Proposed Action Alternative.

6.6. Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) determined the proposed undertaking will not affect federally listed threatened or endangered species. No biological assessment or further Section 7 consultation is required for the undertaking. The No Action Alternative would also have no effect on threatened or endangered species. Coordination with the USFWS is included in Appendix C.

6.7. Wetlands

A field investigation revealed the absence of wetlands within the project boundaries. The setting, physiography and drainage patterns within the project area are not conducive to the natural formation or occurrence of wetlands. The urban setting and previous stabilization measures also restrict the formation of wetlands within the project area. There would be no impacts to wetland resources from either the Proposed or No Action Alternative.

6.8. Noise

The project area is located in a typical urban setting, where ambient noise is mainly associated with vehicle traffic and the operation of machinery such as lawn equipment. Commercial and residential structures, as well as the State Capitol Complex, are located north of Kanawha Boulevard and the project site.

Construction of the proposed project would temporarily increase ambient noise levels due to the operation of construction equipment. The noise levels at the site would fluctuate depending on the types of equipment in use and the way the equipment is operated, therefore noise levels would be variable throughout the workday and project duration. The majority of the construction work will be completed from barges moored in the River. The minimum equipment required for project construction includes an excavator, end loader and a crane. It is anticipated construction equipment would be operated for eight to ten hours per day, generating noise during the daytime hours.

Noise exposure would occur when persons are entering/exiting residences or businesses, driving on Kanawha Boulevard, as well as recreating along the riverbank or outside of nearby structures. During construction, segments of the recreational pathways on the riverbank will be temporarily closed for safety reasons, therefore persons recreating along the pathway will maintain a distance of 80 feet or more from any construction activities. In addition, because the work will be marine based, the steep slope of the riverbank may act as a sound barrier that would serve to muffle noise associated with project construction.

Noise is measured as Day Night average noise levels (DNL) in "A-weighted" decibels to which the human ear is most sensitive (dBA). Noise can impact individual receptors by interfering with activities or causing a risk to hearing. The USACE Safety and Health Requirements Manual (2008) provides criteria for temporary permissible noise exposure levels, for consideration of hearing protection or the need to administer sound reduction controls.

Table 1: Permissible Non-Department of Defense Noise Exposures

Duration/day (hours)	Noise level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105

Noise generated from construction equipment (excavator, end loader and crane) to be utilized during construction range from 80 and 85 dBA, measured from a distance of 50 feet (Federal Highway Administration, 2006). The USACE Safety and Health Requirements Manual, indicate that temporary noise exposure for a period of eight hours at a level of 90 dBA is permissible for Non-Department of Defense Noise Exposures. Since individual noise receptors would be located more than 80 feet from the project construction area, the noise levels and the period of exposure would fall within acceptable limits and would not require additional sound reduction controls.

While the anticipated noise levels generated from construction would be below the level necessary to protect human health, it has the potential to be annoying and interfere with outdoor activities. However, given that the elevated noise levels would be short in duration for individual receptors, and no risk to hearing damage would be present, no significant impacts from the Proposed Action Alternative would be expected.

The No Action Alternative would allow for continued erosion and bank failure. Some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts as the Proposed Action Alternative; however the duration of noise impacts would be shorter and occur intermittently over time.

6.9. Air Quality

The U.S. Environmental Protection Agency (USEPA) is required to set air quality standards for pollutants considered harmful to public health and welfare. The Primary National Ambient Air Quality Standards (NAAQS) set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and prevention of

Draft Environmental Assessment and Planning Design Analysis
Section 14 Streambank Protection Project - Kanawha River 35th Street to Greenbrier Street

damage to animals, crops, vegetation, and buildings. These standards have been established for the following six pollutants, called criteria pollutants under Section 108 of the Clean Air Act (CAA):

-Carbon monoxide (CO)
-Nitrogen dioxide (NO₂)
-Ozone (O₃) 1 Hour
-Ozone (O₃) 8 Hour
-Sulfur dioxide (SO₂)
-Lead (Pb)
-Particulate matter, classified by size as follows:
 - An aerodynamic size less than or equal to 10 micrometers (PM 10)
 - An aerodynamic size less than or equal to 2.5 micrometers (PM 2.5)

According to West Virginia Department of Environmental Protection (WVDEP), the City of Charleston and Kanawha County are considered in nonattainment for particulate matter (PM_{2.5}). Air quality reports for Charleston indicate the maximum measurement of Ozone over an eight hour period is periodically exceeded; however, the city has had an approved Maintenance Plan in place since 2006 and is therefore considered in attainment with NAAQS standard. The Charleston/Kanawha County area is in attainment for all remaining criteria pollutants.

Construction of the Proposed Action Alternative will require the use of one or two cranes, an excavator, and an end loader. The total estimated Ozone (O₃) eight hour emission from this equipment is estimated to be 1.80 tons/year of NO_x and 0.15 tons/year of VOC, and 0.11 tons/year PM_{2.5} using 2008 emissions factors from the USEPA NONROAD model.

Table 2: Estimated Air Quality Emissions from Construction

Equipment	VOC tons/year	CO tons/year	NO_x tons/year	PM 10 tons/year	PM 2.5 tons/year	SO₂ tons/year
Diesel Cranes	0.04	0.14	0.56	0.03	0.03	0.01
Diesel Cranes	0.04	0.14	0.56	0.03	0.03	0.01
Diesel Excavators	0.04	0.20	0.52	0.04	0.03	0.01
Diesel Loaders / Backhoes	0.04	0.16	0.17	0.02	0.02	0.00
Totals (tons/year)	0.15	0.64	1.80	0.11	0.11	0.04

In areas that are in nonattainment, or re-designated in attainment with a maintenance plan the CAA requires that the federal government make a conformity determination to assure their actions would conform to the State Implementation Plan, however because the estimated emissions from construction equipment would be far below the de minimis standards of 100 tons/year, a conformity determination is not required for the Proposed Action Alternative. The Proposed Action Alternative will have no significant impacts to air quality. No significant impacts to air quality would be incurred from the Proposed or No Action Alternative.

6.10. Hazardous, Toxic and Radioactive Waste (HTRW)

In accordance with established USACE HTRW policies (ER 1165-2-132), a Phase I HTRW investigation was completed for the area within the project's construction work limits (CWL). The investigation recorded two (2) concrete structures (potentially sewer manholes), three (3) combined sewer overflow outfalls, approximately ten (10) lower terrace storm water drainage locations, two (2) submarine 24 inch water main crossings, and one (1) unknown white PVC pipe located near the State Capitol Complex.

Based on the investigative findings, recommendations for construction include awareness of combined sewer overflow outfalls with a safety and health plan for potential discharge, avoidance of wastewater discharge, and further investigation if impacts to combined sewer overflow outfalls are detected during construction. The Proposed Action Alternative would adhere to the conditions listed above; therefore no significant impacts associated with HTRW are anticipated.

Under the No Action Alternative bank some small stabilization projects would most likely be undertaken to repair unstable reaches. These piecemeal projects would have similar construction related impacts for a shorter duration and occur intermittently over time. HTRW concerns for these piecemeal projects would be the same as the Proposed Action Alternative.

6.11. Environmental Justice

Under Executive Order 12898 federal agencies are directed to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low income populations. To assess effects, it is necessary to characterize the composition of the affected area to determine if the project would cause disproportionate impacts. According to the U.S. Census Bureau, the 2010 population estimate for Charleston is 51,400. The population has shown a decline of 3.8 percent (%) from the 2000 estimate of 53,421. The estimate lists the population as 78% white, 16% black, 2% Asian, and 0.2% American Indian. The table below summarizes the minority population, median household income and population living below the poverty level for the City of Charleston and the State of West Virginia.

Table 3: U.S. Census Information

	Charleston	West Virginia
Percent Minority	19.4%	17.8%
Median Income	\$34,009	\$37,423
Percent Living Below the Poverty Level	16.7%	17.8%

The Proposed Action Alternative does not unfairly affect any segment of the population because the project would protect public resources that provide service to the entire city regardless of minority or income status. Therefore the proposed project would have no effect on minority and low-income populations and is in compliance with Executive Order 12898.

The No Action Alternative will postpone impacts, but may not avoid impacts to the local community. Some bank some small stabilization projects would most likely be undertaken to repair unstable reaches; however these efforts would have no effects on minority and low income populations.

6.12. Traffic and Navigation

Kanawha Boulevard may incur limited disruptions from the proposed construction activities. One lane of east bound traffic closest to the River may require closure for short periods in order to load/unload equipment and supplies. Any lane closures will be coordinated with the City and the West Virginia Department of Transportation.

The Kanawha River is a navigable river covered by Section 10 of the Rivers and Harbors Act of 1946, as amended (PL79-526) which regulates structures or work that obstructs or alters navigable waters. Most of the work will be completed with construction equipment located on barges moored on a shallow water bench in the River. This work would have the potential to temporarily impact navigation traffic, although impacts are not anticipated. To minimize the impacts to navigation, a Notice to Navigation Interests will be issued from the USACE Huntington District to advise the navigation industry of the proposed project.

For the No Action Alternative, it is anticipated that some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts as the Proposed Action Alternative; however the duration of impacts would be shorter and occur intermittently over time.

6.13. Floodplain Management

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The project is within the 100 year floodplain and regulatory floodway, as there are no practicable alternatives to avoiding the floodplain. Therefore, it is subject to Executive Order 11988.

For the Proposed Action Alternative, the floodplain would remain consistent with the current conditions. New stone slope treatment will be placed over the existing stone, but the structure and function will remain the same. The project would stabilize the slope and is consistent with the original design of the existing stone treatment; therefore the project is not expected to result in further development or modification of the floodplain.

Under the No Action Alternative, it is anticipated that some bank some small stabilization projects would most likely be undertaken to repair unstable reaches. These projects would be similar to the proposed project except smaller in scale, occur intermittently over time, and would have no significant effect on floodplain development.

6.14. Cumulative Effects

The USACE must consider the cumulative effects of the proposed project on the environment as stipulated in the National Environmental Policy Act (NEPA). Cumulative effects are “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions”. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Part 1508.7 Council on Environmental Quality [CEQ] Regulations).

Temporal and geographical limits for the project must be established in order to frame the cumulative effects analysis. The geographic boundary would coincide with the City of Charleston. Project life is considered to be 50 years; therefore, that is the future temporal boundary of this analysis. Direct and indirect effects resulting from the implementation of the proposed project have been outlined in this report. For the Proposed Action Alternative, recreation, noise levels, air quality, aquatic, and historic resources have the potential for cumulative effects.

Past and Present Actions

The Kanawha River around Charleston has been impacted by human settlement and development since the 1800's. Historically, aquatic resources on the River have been impacted by human actions including water pollution, navigation, land use changes, and development throughout the watershed. The region's most important natural resource is coal, forming the basis for much of the economic and demographic development. The Kanawha River navigation system consists of three locks and dams constructed in the 1930's and is navigable for about 91 miles. Most river traffic is downbound and composed largely of coal destined for electric generating facilities in the Ohio River Basin. Nine miles of River lie within city limits of Charleston. The riverbank in the area is steep with little to no riparian buffer. Approximately five miles of the lower slope on the right descending bank is covered with stone. At the proposed project site, the stone protection has been in place since the late 1930's.

Reasonable Foreseeable Future Actions

Reasonable foreseeable actions that may impact these resources include: the completion of additional streambank protection projects, separation of the combined sewer overflow system, roadway repairs along Kanawha Boulevard, and further development along the riverfront. Future projects could result in additional changes to the riverbank in the Charleston area, and have the potential to effect historical resources, as well as the quantity and quality of public access to the River.

Analysis

Construction activities would temporarily limit recreation opportunities along the riverbank, increase turbidity in the River, and increase noise levels and emissions from construction equipment in the project vicinity; however these impacts will be short in duration and would not contribute significantly to cumulative effects.

Construction of the project would affect historical and recreational resources by permanently removing nine lower stairs which are: 1) considered contributing elements to historic Kanawha Boulevard, and 2) provide access between the lower pathway and the River. Determining the cumulative effects associated with these resources is somewhat subjective. The Proposed Action Alternative will remove stairs; however it will improve the lower recreational pathway. Also, the effects to historical resources will be offset through mitigation. The proposed mitigation includes repurposing a minimum of five stairs as benches that will be installed along the lower pathway, as well as installing an interpretative sign with a brief history of the PWA and the creation of Kanawha Boulevard, further enhancing the aesthetics and recreational opportunities in the project area. Direct access to the River will remain available at the stairs of the State Capitol building. Additionally, there are three public parks located within two miles of the proposed

project that also provide public access to the River, therefore the potential for adverse cumulative effects is not considered significant. Overall, resources in the area would realize long term benefits by stabilizing the riverbank and reducing risk to public infrastructure, therefore, the Proposed Action Alternative would have a cumulative net benefit.

When considering future actions of others, riverfront projects are not anticipated to result in adverse cumulative effects. Over the past several years, the city has been working to capitalize on the recreational and economic potential of the riverfront. The city completed a Riverfront Master Plan document for the riverfront in 2006, which includes the broad goals of creating more usable park space along the riverfront and enhancing recreational, historical and cultural qualities of the River. In addition, projects requiring work in, over or under navigable water will require a permit from USACE. In order to obtain a permit, the applicant will need to coordinate the activities with state and federal agencies, reducing the likelihood of adverse impacts.

7. Hydraulic Analysis

A hydrologic and hydraulic evaluation of a proposed stream bank protection project was performed to assist in the determination of a minimum stone size. The study reach starts approximately 60 miles upstream of the confluence of the Kanawha River with the Ohio River at the town of Pt. Pleasant. The contributing drainage area of the reach is approximately 8,882 square miles. Discharges used in evaluation of a minimum stone size were taken from the Federal Emergency Management Agencies (FEMA) Flood Insurance Study (FIS) for Kanawha County, West Virginia and Incorporated Areas, February 6, 2008.

Based on a steady-flow mixed flow regime analysis, water surface profiles were created for the aforementioned recurrence interval discharges. The hydraulic properties of the cross-section in the project reach were determined for later use in stone sizing. The maximum channel velocity in the project area resulting from a 100-year flood discharge was 6.8 feet/second (ft/sec) and occurred at the channel thalweg. The stone slope protection is only to extend slightly below the normal pool elevation of 566 feet; therefore hydraulic properties were determined at this location. The local velocity at this location was computed to be approximately 5.0-ft/sec.

Stone requirements for stream bank protection in the project area are based on the criteria and procedures outlined in EM 1110-2-1601 Hydraulic Design of Flood Control Channels. As mentioned above, the maximum average channel subsection velocity for the 100-year discharge was computed to be approximately 5.0 ft/sec at the protected area. The maximum channel depth of the 100-year discharge at this location was calculated to be approximately 25-feet. Maximum average boundary shear stress was calculated to be 0.27 pounds per square foot (lb/ft²) at the protected area.

The recommended gradation limits were provided to the study team, however, it was determined that a wider gradation should be used to meet filter criteria with the bedding/filter material and to protect the stone from launching because of secondary return currents resulting from storm outfall extensions, headwalls, and stilling features. The proposed gradation limits are included in Table 4 and meet the critical stone size for the D₃₀ and D₅₀ and is therefore recommended as a viable replacement.

Table 4: Proposed Stone Gradation for Kanawha Blvd Section 14 Project

PERCENT LIGHTER BY WEIGHT	PROPOSED STONE DIAMETER (IN.)
D ₁₀₀	18
D ₉₀	14
D ₅₀	9
D ₃₀	6 ½
D ₁₅	4 ½

8. Economic Costs and Justification for Proposed Action Alternative

Economic Costs

A cost estimate for the Proposed Action Alternative was completed based on 1 October 2012 (FY13) prices and conditions. Total non-fully funded cost to construct this project is estimated to be \$2,184,000. The fully funded cost is estimated to be approximately \$2,222,000. Complete details regarding the project cost estimate may be found in Appendix F Baseline Cost Estimate.

Table 5: Estimated Economic Costs for Preferred and Relocation Alternatives

Estimated Economic Costs for Preferred and Relocation Alternatives	
FY 2013 Price Level	
Proposed Action Alternative (Least Cost Alternative)	
Fully Funded Project Cost	\$2,222,000
Non-Fully Funded Project Cost	\$2,184,000
Economic Project Cost (Project Cost Less Sunk Cost)	\$2,084,000
Estimated Annual Project Cost (3.75% for 50 years)	\$92,893
Annual Operations and Maintenance	\$5,000
Total Annual Economic Cost	\$97,893

Draft Environmental Assessment and Planning Design Analysis
Section 14 Streambank Protection Project - Kanawha River 35th Street to Greenbrier Street

Relocation Alternative	
Estimated Project Cost	\$10,000,000
Estimated Annual Project Cost (3.75% for 50 years)	\$445,742
Annual Operations and Maintenance	\$0
Total Annual Economic Cost	\$445,742

Economic Justification

The benefits for the project are the lesser of:

1. The least cost relocation alternative; or
2. The value of the infrastructure benefits forgone if no corrective action is taken.

The benefit-cost ratio (BCR) of the protection alternative is based on the comparison of the annual cost of the Relocation Alternative with the annual cost of the Proposed Action Alternative.

$$BCR = \frac{\text{Annual Economic Cost of Relocation Alternative}}{\text{Annual Economic Cost of Proposed Action Alternative}}$$

$$BCR = \frac{\$445,742}{\$97,893}$$

$$BCR = 4.55$$

Cost Sharing

As stated earlier, the project cost is shared between the Federal (65%) and Non-Federal sponsor (35%). Details of cost share responsibility are shown in the table below.

COST SHARE RESPONSIBILITIES	
FY 2013 Price Level	
Estimated Federal Cost - 65%	\$1,379,000
Estimated Non-Federal Cost - 35%	\$743,000
Federal Feasibility CAP Cost – 100%	\$100,000
Estimated Total Project Cost	\$2,222,000

9. Real Estate

The non-federal sponsor, the City of Charleston, West Virginia, is required to furnish all lands, easements, and rights-of-way to accommodate the construction, operation and maintenance of the project. The land required for the project is approximately 21.3 acres and is owned in fee by the non-federal sponsor. The minimum estate required for the project is a stream bank protection easement. Of the 21.3 acres, approximately 3.1 acres lies within the U.S. Route 60 / Kanawha Boulevard right-of-way, which will require a permit from the West Virginia Department of Transportation for construction of the project.

The United States, under the jurisdiction of the USACE, owns a flowage easement over a portion of the project area. The easement is for the purpose of maintaining the Winfield Lock and Dam pool up to the elevation of 573 ft-msl. There is no known relocation of public utilities or facilities required for the project. The project will not require displacement of persons or businesses. There are no boat ramps, boat docks, patios, etc. located on the project site.

The real estate responsibility, requirements, and procedures have been or will be fully discussed with the non-federal sponsor. The sponsor's ability to provide the necessary interests in land is not in question.

10. Public and Agency Coordination

10.1 Public Involvement

The draft Environmental Assessment (EA) and Planning Design Analysis (PDA) will be made available to federal and state agencies, other interested parties, and the general public for a thirty (30) day review period. A mailing of entities that received a copy of the draft is included in Appendix D. The draft EA and PDA will also be posted on the Huntington District website for public review at <http://www.lrh.usace.army.mil/Missions/PublicReview.aspx>.

A Notice of Availability (NOA) for the draft EA and PDA has been prepared (Appendix E) and will be published in the Charleston Gazette regarding this document. All comments received during the thirty (30) day comment period will be considered in the final EA and PDA.

10.2 Agency Coordination and Scoping

Coordination with federal and state resource agencies was conducted in conjunction with the preparation of the draft EA and PDA. Input was sought from the USFWS, USEPA, WVDEP, WVSHPO, West Virginia Department of Natural Resources, West Virginia Department of Transportation, and the West Virginia Division of Highways. Scoping responses are included in Appendix C.

Draft Environmental Assessment and Planning Design Analysis
Section 14 Streambank Protection Project - Kanawha River 35th Street to Greenbrier Street

A scoping letter regarding the proposed streambank protection project was sent to state, federal and other interested parties. Five responses were received as part of the initial scoping process. The scoping letter and comments received are included in Appendix C and summarized below.

- The USFWS issued a response on 11 August 2011 stating that the proposed project would have no effect on federally-listed endangered species. Therefore no biological assessment or further section 7 consultation under the Endangered Species Act is required.
- The Kanawha Valley Historical & Preservation Society, Inc. issued a response on 11 August 2011 stating they are pleased with the past streambank repairs as well as the proposed project. They expressed concern over the visual impact of the project. A detailed description of the proposed alternatives and a typical section of the Proposed Action Alternative were forwarded for their review and comment.
- The City of Charleston Municipal Beautification Commission issued a response on 25 August 2011 stating they are pleased with the previous Streambank Protection Project between the Patrick Street Bridge and Magic Island and would prefer to see the same design for the proposed project.
- The WVSHPO issued a response on 31 August 2011 stating that it is very unlikely that intact archaeological sites will be encountered. There will be no effect to archaeological resources that may be eligible for inclusion in the NRHP as long as an alternative not requiring the relocation of Kanawha Boulevard is selected. A relocation of Kanawha Boulevard would require additional coordination. Kanawha Boulevard within the project area is eligible for the NRHP under Criterion A and C. Additional information on project impacts to Kanawha Boulevard is required once an alternative is selected.
- The Charleston Historic Landmarks Commission issued a response on 12 September 2011 stating they felt there would be no adverse effect to historic properties as part of the undertaking. They also stated that they are in favor of alternatives most closely maintaining existing conditions and are most concerned with impacts to the existing recreational pathways.
- The West Virginia Division of Highways issued a response letter on 14 October 2011. They did not express concerns with the project, but stated that they are implementing a shared path along Kanawha Boulevard from 35th Street to Daniel Boone Park. This path is an extension of the upper pathway starting at the eastern terminus of the project. The WVDOH also provided an electronic copy of the original plans for the Boulevard's construction.

Draft Environmental Assessment and Planning Design Analysis
Section 14 Streambank Protection Project - Kanawha River 35th Street to Greenbrier Street

An adverse effect letter regarding the proposed streambank protection project was sent to WVSHPO and interested parties. Three responses were received. The adverse effect letter and received comments are included in Appendix C and summarized below:

- The Advisory Council on Historic Preservation (ACHP) has requested additional information prior to determining if their participation is warranted.
- The Kanawha Valley Historical & Preservation Society, Inc. understands the practical considerations for stair removal, but questioned the loss of service for local residents associated with the loss of the lower stairs as well as the visual impacts associated with stair removal. The Society noted the District was able to rebuild two (2) of eleven (11) sets of lower stairs from Patrick Street to Magic Island and requested the District rebuild three (3) of the nine (9) sets of lower stairs proposed to be dismantled as part of the preferred alternative.
- The WVSHPO stated the removal of the lower stairs from Patrick Street to Magic Island also resulted in an adverse effect and that a Memorandum of Agreement (MOA) was not completed. Their response concurs the preferred alternative will result in an adverse effect and requested additional information before resolving the adverse effect. Requested information included analysis of project and project costs, design possibilities to retain historic components, photographs of existing components that will be impacted, and photographs of alterations to Patrick Street to Magic Island. A request was also made to forward the information to the Kanawha Valley Historical & Preservation Society, Inc. and to contact the Charleston Historic Landmarks Commission. Additional coordination with WVSHPO outlined project scoping responses and responses to the adverse effect as well as project costs and an engineering analysis of the PWA stairs. WVSHPO responded with a letter stating that prior to moving forward with a MOA and deciding upon final mitigation measures, the public be allowed the opportunity to provide feedback on final mitigation measures.

11. References

Encyclopedia Britannica, Inc. (2012). PWA information retrieved from
(<http://www.britannica.com/EBchecked/topic/482574/Public-Works-Administration-PWA>).

Federal Highway Administration. (2012).
(http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm)

U.S. Army Corps of Engineers. (2008). Final Environmental Assessment and Planning Design Analysis Section 14 Emergency Streambank Protection Project Patrick Street to Magic Island, City of Charleston, West Virginia.

U.S. Army Corps of Engineers. (Revised 2012). Kanawha River Navigation Charts,

U.S. Army Corps of Engineers. (2008). Safety and Health Requirements EM 385-1-1

U.S. Census Bureau. (2012). (<http://quickfacts.census.gov/qfd/index.html>)

U.S. EPA Air Data. (2012). (<http://www.epa.gov/airdata>)

West Virginia Department of Environmental Protection. (2012).
(<http://www.dep.wv.gov/daq/planning/NAAQS/Pages/AreaswithApprovedMaintenancePlans.asp>)

West Virginia Department of Transportation. (2012).
(http://www.transportation.wv.gov/highways/programplanning/preliminary_engineering/traffic_analysis/trafficvolume/urbancounts/Pages/default.aspx)

APPENDIX A

PROJECT PLANS

Proposed Stone Gradation for Kanawha Blvd Section 14 Project

PERCENT LIGHTER BY WEIGHT	PROPOSED STONE DIAMETER (IN.)
D ₁₀₀	18
D ₉₀	14
D ₅₀	9
D ₃₀	6 ½
D ₁₅	4 ½

Proposed Bedding/Filter Material for Kanawha Blvd Section 14 Project

SIEVE SIZE	PROPOSED PERCENT PASSING
2"	100
1 ½"	64.5
¾"	43.5
½"	12
3/8"	7
#4	1.5

APPENDIX B

ENGINEERING ANALYSIS OF STAIR FEATURES

MEMORANDUM FOR RECORD

SUBJECT: Charleston WV Section 14 Project Risk with Inclusion of Historic Stair Rebuild

Flood and high river stage bank soil (hydraulic fill) saturation and groundwater recharge of banks between 35th Street to Greenbrier Avenue have resulted in extensive erosion and failure related endangerment of US Route 60. During Kanawha River recession from flood and high stages, and as a result of significant precipitation events, bank area groundwater discharges result in internal erosion, piping of hydraulic fill (layered and lensed river alluvium of which the banks were constructed) which causes slope failures and displacement of overlying derrick stone. The failed hydraulic fill, including both piped out silts and sands and collapsed gravel and cobble lenses and derrick stone accumulate along the toe of slope at the Kanawha River Normal Pool and Water contact (566 msl). Subsequent high water and flood events re-work and erode failed hydraulic fill materials. Derrick stone accumulations, which include large stone 36" by 48", remain as a toe of upper bank armoring feature. Successive flood flow erosion result in exposure and failure of the hydraulic fill and formation of additional upper slope scarp features. These unstable erosion and failure bank reaches are then subject to additional high water stages and recessional failures since these saturated hydraulic fills continue to drain slowly as the Kanawha recedes from river crests to near normal pool stages.

As a result of these interrelated bank erosion and failure processes the previously constructed stone stairways and storm water outfall flumes have become locations of most severe bank instability.

At the inception of this project, design engineers reviewed the recently constructed Patrick Street to Magic Island Section 14 Project. Stair reconstruction within the Patrick Street to Magic Island Section 14 project caused the blinding of the underlying hydraulic fill. Additional excavation and extensive placement of geosynthetic filter and granular bedding and filter material, and graded stone slope protection was constructed in what was believed would address stone stair structure foundation instability and the probability of these structures being otherwise outflanked. These components have not been effective since the constructed stairs precluded localized discharge of groundwater. This condition resulted in increased exit gradients and exit velocities at the edges of the stairs and within adjacent slope areas which resulted in loss of foundation, filter, and bedding materials. Furthermore, vandalism has resulted in the removal of stone slope protection for unauthorized uses. This vandalism has exposed additional bedding and filter material and resulted in stair misalignment and void formation and has increased the probability of failures.



Exposed and Lost Bedding Material on Downstream Side of Stairs as a Result of Vandalism at Patrick Street to Magic Island Section 14 Project



Exposed and Lost Bedding Material on Downstream Side of Stairs as a Result of Vandalism at Patrick Street to Magic Island Section 14 Project



Void Formation as a Result of Loss of Filter Material and Piped Foundation Soils Adjacent to Stone Stairs at Patrick Street to Magic Island Section 14 Project



Loss of Bedding and Filter Material Adjacent to Stairs at Patrick Street to Magic Island Section 14 Project Which will Result in Subsidence and Loss of Hydraulic Fill Foundation



**Void Formation Behind Maintenance Grout Filling of Void at Patrick Street to Magic Island
Section 14 Project**

Therefore the District should not modify established design requirements or construction practices to replace any of the eroded and failed stone stairs since construction of these features would result in a defect in the bank treatment. Stair placement would result in increased project failure risk and uncertainty. More frequent project monitoring, evaluations, and costly repairs to the stairs and adjacent related areas of stone slope protection failures would be necessary to prevent outflanking of the stone slope protection at the stairs.

Respectfully submitted by,

Alexander B. Neal, P.E.

Lead Engineer

Kanawha Boulevard Section 14 Project

APPENDIX C

PROJECT COORDINATION AND COMMENTS



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

August 1, 2011

Planning Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Mary Jane Vanderwilt
Municipal Beautification Commission
1208 Upper Ridgeway Road
Charleston, WV 25322

Dear Ms. Vanderwilt:

The U.S. Army Corps of Engineers, Huntington District (District) is initiating scoping under the National Environmental Policy Act (NEPA) to assist the District in evaluating the potential impacts of a proposed streambank protection project along the Kanawha River within the city limits of Charleston, West Virginia. The study is being conducted under authority of Section 14 of the Rivers and Harbors Act of 1946, as amended. The Act authorizes the Corps of Engineers to plan and construct emergency streambank and shoreline protection projects to protect endangered highways, highway bridge approaches, and public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities.

The District is providing assistance to the City of Charleston, West Virginia with streambank erosion along the right descending bank of the Kanawha River between river mile 60 and 61. Recent high water and flood events have resulted in endangerment to US Route 60 which is a critically essential transportation route. Flood flow erosion and recession related piping of fill and alluvial soil have resulted in extensive stone and fill displacement and bank failure and retreat.

The existing displaced stone is associated with a Works Progress Administration (WPA) project which was constructed in the late 1930's. The WPA was an extension of the Federal Emergency Relief Administration which provided training and employment for the unemployed utilizing basic construction skills. However, projects constructed under this authority did not require maintenance and no agreements were effected with local interest. Since construction, extensive flood related bank failure and erosion has outflanked this treatment and continually caused loss of bank material and derrick stone.

Alternatives being considered include: 1.) Toe of slope stone blanket with upper bank trench drains. This alternative involves the placement of granular bedding and filter material, a filter fabric (where necessary), a filter transition, and a stone blanket placed on the existing derrick stone and bank material on the lower bank slope with trench drains placed on the upper bank slope. 2.) Gabions, mat and block. This alternative involves rectangular baskets and mats made of steel wire filled with stone that would be keyed-in at the toe and the top of the bank. 3.) Top of bank stone blanket. This alternative involves stone placement from the normal pool of the Kanawha River to US Route 60. 4.) Vegetative cover. This alternative would require excavating the existing bank to stable

slope geometries to allow placement of vegetation and would require the relocation of the current recreational pathways and US Route 60. 5.) Relocation of highway and utilities. This alternative consists of the relocation of existing recreational pathways and US Route 60 away from the existing river bank. 6.) No action.

Approximately 5,400 feet of streambank is proposed for bank stabilization. This proposed 5,400 foot section is located between 35th Street Bridge and Greenbrier Street, approximately 2 miles south of the Patrick Street to Magic Island Emergency Streambank Protection Project which was completed in 2008. Maps have been included with this correspondence which illustrate the current project's location, the current project's location in relation to the Patrick Street to Magic Island Emergency Streambank Protection Project, as well as proposed construction work limits.

In accordance with NEPA and applicable implementing regulations, an Environmental Assessment (EA) will be prepared to evaluate potential direct, indirect and cumulative effects of project alternatives. The District is soliciting public and agency comments concerning environmental issues to be addressed in the course of the NEPA process, as well as comments regarding plans and proposals which may impact or influence community resources. The EA will make the determination to proceed with an Environmental Impact Statement (EIS) or conclude the NEPA process in a Finding of No Significant Impact (FONSI).

This letter also serves to initiate the public involvement requirements of Section 106 of the National Historic Preservation Act of 1966, as amended. Section 106, implemented by regulations at 36 CFR 800, requires the District to consider the undertakings effects on historic properties. If required, appropriate architectural and archeological investigations will be conducted within those areas affected by the proposed undertaking and the resulting findings will be coordinated with the West Virginia State Historic Preservation Office and other consulting parties.

Please provide the District with any concerns or information you have relating to this project prior to August 30, 2011. Responses should be mailed to the address listed above or emailed to the addressor listed below. If you have any additional questions, please contact Susan Stafford at 304-399-5729 or by email at Susan.B.Stafford@usace.army.mil. Your participation is greatly appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jay Aya-ay', with a long horizontal flourish extending to the right.

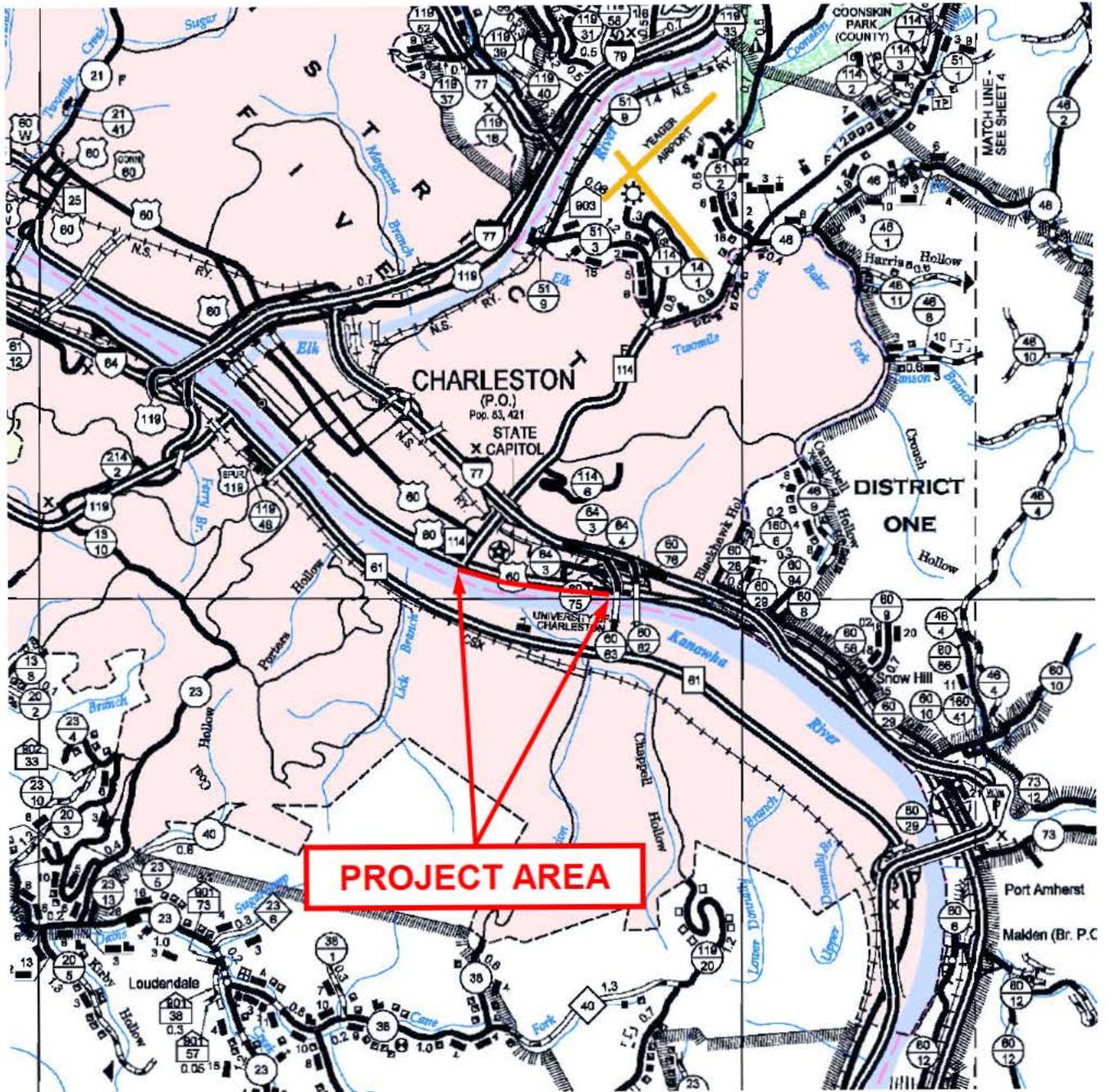
Jay Aya-ay
Chief, Environmental Analysis Section

Enclosures

1. Highway Map with Current Project Location
2. Topographic Map with Current Project Location
3. Topographic Map with Current and Previous Project Locations
4. Proposed Construction Work Limits

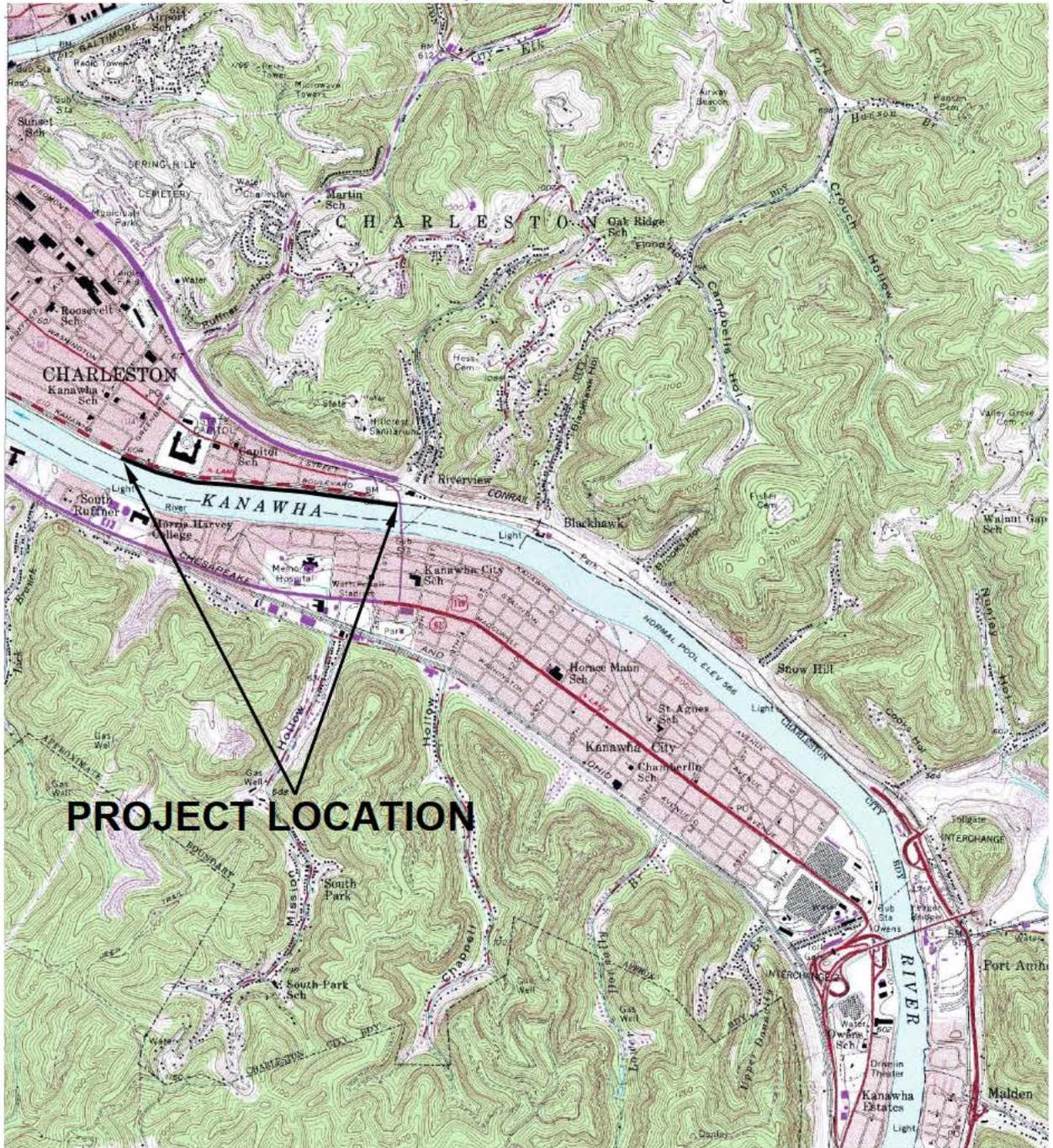
Kanawha County West Virginia

Highway Map



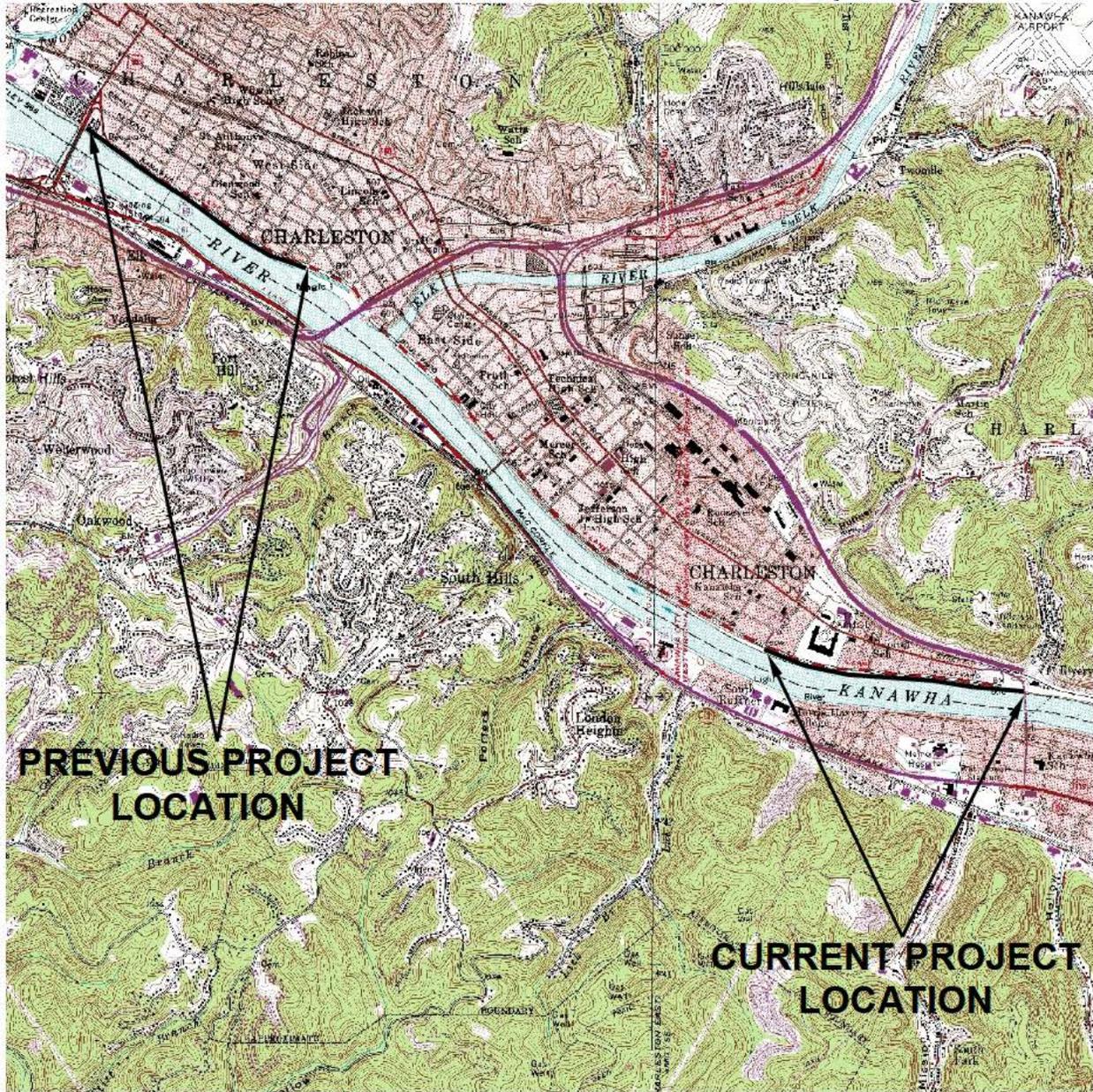
Topographic Map with the Current Project Location

1976 Charleston East, WV 7.5' USGS Quadrangle

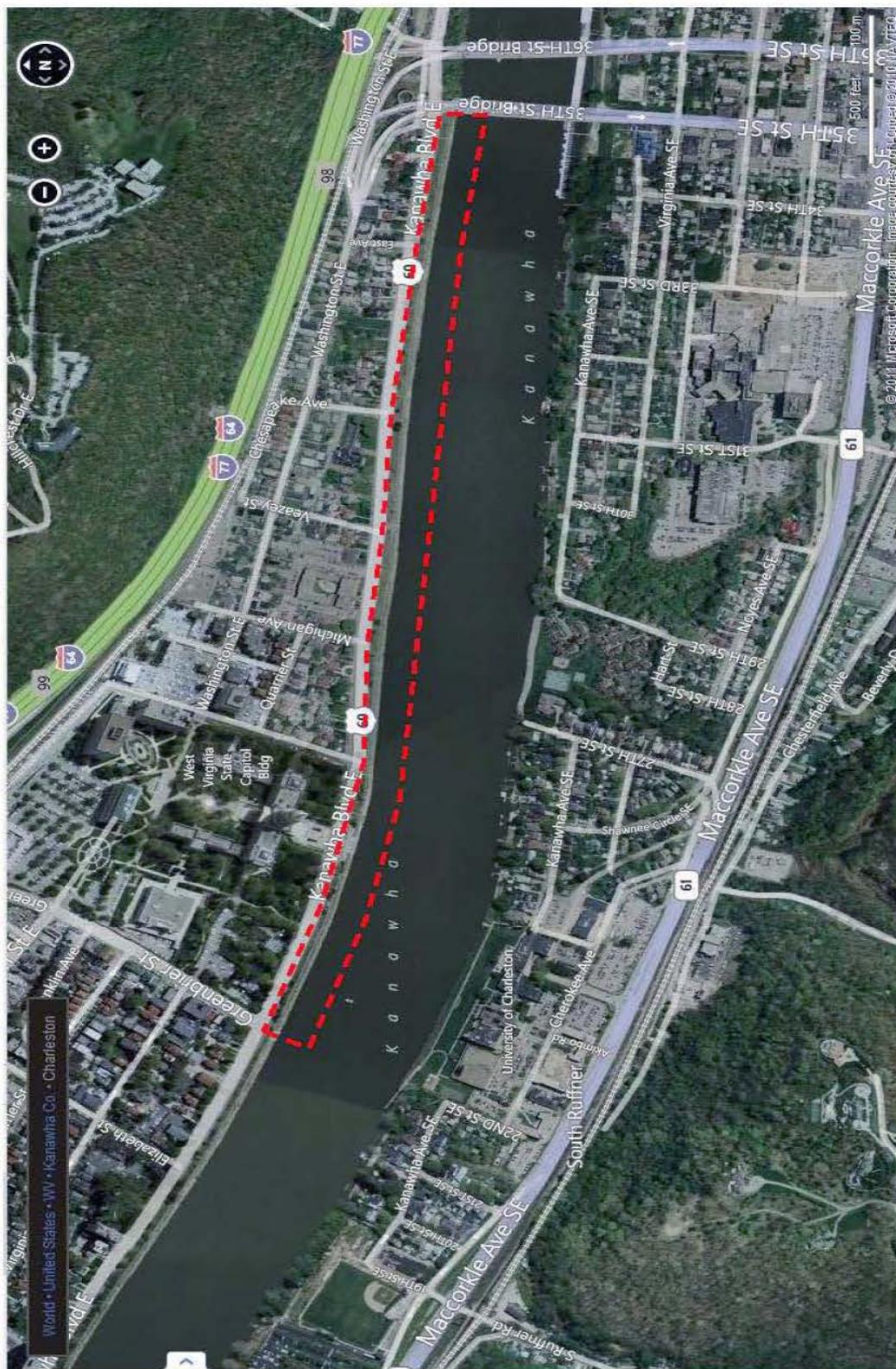


Topographic Map with Current and Previous Project Locations

1976 Charleston East and Charleston West, WV 7.5' USGS Quadrangle



Proposed Construction Work Limits for the Current Project



Mailing List

Deborah Carter
Field Supervisor
US Fish and Wildlife Service
694 Beverly Pike
Elkins, WV 26241

John Forren
NEPA/404 Coordinator
USEPA Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Janet Clayton
WV Department of Natural Resources
P.O. Box 67
Elkins, WV 26241

Lyle Bennett
WVDEP
601 57th Street SE
Charleston, WV 25304

Susan Pierce
Deputy State Historic Preservation Officer
State Historic Preservation Office
1900 Kanawha Boulevard, East
Charleston, WV 25305-0300

Lori Brannon c/o Planning & Zoning Dept.
Charleston Historic Landmarks Commission
915 Quarrier Street
Charleston, WV 25301

Henry Battle, President
Kanawha Valley Historical & Preservation
Society, Inc.
P.O. Box 2283
Charleston, WV 25328

Gerry Workman, Chairman
Municipal Planning Commission
515 Havana Drive
Charleston, WV 25311

Ric Cavender
Executive Director
East End Main Street
1116 Smith St.
Charleston, WV 25301-1314

David Molgaard, City Manager
501 Virginia Street East, Room 101
Charleston, WV 25301

Chris Knox, City Engineer
105 McFarland Street
Charleston, WV 25301

Mary Jane Vanderwilt
Municipal Beautification Commission
1208 Upper Ridgeway Road
Charleston, WV 25322



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

August 1, 2011

RECEIVED

AUG 03 2011

WVFO

Planning Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Deborah Carter
Field Supervisor
US Fish and Wildlife Service
694 Beverly Pike
Elkins, WV 26241

Dear Ms. Carter:

The U.S. Army Corps of Engineers, Huntington District (District) is initiating scoping under the National Environmental Policy Act (NEPA) to assist the District in evaluating the potential impacts of a proposed streambank protection project along the Kanawha River within the city limits of Charleston, West Virginia. The study is being conducted under authority of Section 14 of the Rivers and Harbors Act of 1946, as amended. The Act authorizes the Corps of Engineers to plan and construct emergency streambank and shoreline protection projects to protect endangered highways, highway bridge approaches, and public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities.

The District is providing assistance to the City of Charleston, West Virginia with streambank erosion along the right descending bank of the Kanawha River between river mile 60 and 61. Recent high water and flood events have resulted in endangerment to US Route 60 which is a critically essential transportation route. Flood flow erosion and recession related piping of fill and alluvial soil have resulted in extensive stone and fill displacement and bank failure and retreat.



United States Department of the Interior

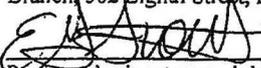
FISH AND WILDLIFE SERVICE



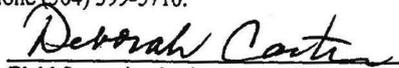
West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

In response to your letter above, we have made a "no effect" determination that the project will not affect federally-listed endangered or threatened species. Therefore no biological assessment or further section 7 consultation under the Endangered Species Act is required with the Fish and Wildlife Service. Should project plans change, or if additional information on listed and proposed species becomes available, this determination may be reconsidered.

Definitive determinations of the presence of waters of the United States, including wetlands, in the project area and the need for permits, if any, are made by the U.S. Army Corps of Engineers. They may be contacted at: Huntington District, Regulatory Branch, 502 Eighth Street, Huntington, West Virginia 25701, telephone (304) 399-5710.



Reviewer's signature and date 8/11/11



Field Supervisor's signature and date 8/11/2011

KANAWHA VALLEY HISTORICAL & PRESERVATION SOCIETY,
Inc. _____ 714 Peoples Building, Charleston, WV 25301
POB 2283, Charleston, WV 25328 * (304) 342-7676 * www.KVHPS.org

Susan Stafford
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, WV 25701

August 11, 2011

Re: Kanawha River right descending bank mile 60-61 protection project

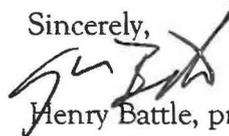
Dear Ms. Stafford:

The Kanawha Valley Historical & Preservation Society, Inc. is vitally interested in the historic integrity of the Kanawha Boulevard, including of course the maintenance of the Kanawha river banks. We are pleased with the past and now proposed future streambank repairs in the Boulevard area described in the letter of August 1, 2011 from Jay Aya-ay and . appreciate the opportunity to comment.

Our concern is with the visual impact of the proposal on the historic appearance of the Boulevard and associated riverbank. Since we not unfamiliar with the various alternatives suggested, we would like to have simple sketches of each alternative, including plan, elevation and cross-section views. You can reach us using the letterhead information. We will immediately review them and respond timely.

Thank you for the opportunity to participate - we believe the long-term stability of the Kanawha Boulevard, Charleston's defining work of infrastructure, is essential to the viability of the City.

Sincerely,



Henry Battle, president

From: Stafford, Susan LRH
To: "JW42346@frontier.com"
Subject: RE: Alternatives for the Greenbrier Street to 35th Street Project (UNCLASSIFIED)
Date: Thursday, August 25, 2011 7:21:00 AM

Classification: UNCLASSIFIED
Caveats: NONE

Good Morning,

I'm sorry I missed your call Tuesday afternoon. I have been out of town and unable to forward you the email information that I had originally sent to your old aol email address. If you have any questions, feel free to send an email or call.

Below are the detailed descriptions of proposed alternatives for the Greenbrier Street to 35th Street Emergency Streambank Protection Project in Charleston. I provided a very general description in a scoping letter that was sent out at the beginning of the month. Henry Battle requested the detailed information in an telephone conversation earlier in the week. We have completed preliminary evaluations, but are still in the early phases of project design.

C.1 Toe of Slope Stone Blanket with Upper Bank Trench Drains.

Requirements for the construction of this plan include the placement of granular bedding and filter material, a filter fabric (where necessary), and filter transition and stone blanket placed on the derrick stone and hydraulic fill on the lower bank slope and trench drains placed on the upper bank slope. The treatment would be approximately 5,400 feet in length and extend approximately 21 to 23 feet up the bank to a paved recreational pathway, and an additional 20 feet of trench drain placement would extend to the top of upper bank. The treatment would not include the 35th Street Bridge abutment and would extend to Greenbrier Street. The treatment would include bedding/filter material placed on the lower bank slope and filter fabric, where necessary. Excavation would be required in order to "key in" the fabric at the physical limits of the treatment as well as for constructing the upper bank trench drains. Durable stone, with a transitional filter component, would then be placed over the filter material on the lower bank slope. The stone would have an approximate top size of 15 inches, and the treatment would be 3 feet in depth. The upper bank trench drains would be encapsulated with filter fabric and backfilled with stone. Up and downriver transitions would be constructed to prevent outflanking of treatments. The sandstone block stairs would be stored on site for use by the City. Within disturbed areas adjacent to stone placement areas, a filter fabric, topsoil, and native grass seed mix would be placed to prevent erosion.

C.2 Gabions/Mat/Block.

Gabions would include rectangular baskets and mats made of steel wire filled with stone. The gabion structure would be keyed-in at the toe and the top of the bank and at transitions. This would require excavating trenches along the length and at up and down stream limits of the lower bank to be protected. Additionally, these gabion structures would require filter materials. Gabion structures would be built in the following configuration. The mats and gabions would be placed on a filter and underlying granular bedding material and hydraulic fill. The gabion baskets and mats would then be filled with stone 4 to 8 inches in diameter closed and secured.

C.3 Top of Bank Stone Blanket.

Stone placement from the normal pool to US Route 60 was evaluated. The District has evaluated upper slope conditions and determined that maintenance of vegetation cover with trench drains would provide sufficient slope protection.

C.4 Vegetative Cover.

Vegetative treatments cannot be implemented at this site due to continuing failures and erosion occurring along the river bank. Persistent groundwater seeps and frequent pool fluctuations preclude the establishment of vegetative treatment within defined limits. Excavating to stable slope geometries to allow placement of vegetation would require the relocation of the current recreational pathways and

US Route 60 and would not affect sufficient stability or be sustainable, or cost justifiable.

C.5 Relocation of Highway and Utilities.

This alternative consists of the relocation of existing recreational pathways and US Route 60. Relocation would include acquisition of real estate and relocation of utilities.

C.6 No Action Alternative

For the No Action alternative, the Corps of Engineers would not provide streambank stabilization for US Route 60 along the right descending bank of the Kanawha River between Greenbrier Street and the 35th Street Bridge. Erosion and bank failure would continue, and would extend upslope from the recreational pathway to US Route 60, unless stabilization treatments are installed. Some stabilization efforts have been conducted by the City of Charleston in an effort to address erosion features, such small scale efforts would be expected to continue. However, these limited stabilization projects do not effectively address erosion and recession related piping of fill and alluvial soil and would allow for continued stone and fill displacement, bank failure and retreat with eventual failure of US Route 60.

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Stafford, Susan LRH

From: Blankenship, Dottie [dottie.blankenship@cityofcharleston.org]
Sent: Thursday, August 25, 2011 9:43 AM
To: Stafford, Susan LRH
Subject: Proposed Streambank Protection Project

Ms. Stafford

Municipal Beautification Commission has been very pleased with the previous Streambank Protection Project between the Patrick Street Bridge and Magic Island. We would prefer that this design be continued for the section now under consideration between Greenbrier Street and the 35th Street Bridge.

Having the stone cover from the water edge to the lower sidewalk decreases the difficulty Public Ground employees have in keeping the rip rap free of weed trees and other vegetation.

Thank you,

Dottie Blankenship emailing for

Municipal Beautification Commission

Mary Jane Vanderwilt, Chairman

CONFIDENTIALITY NOTE: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.



**CITY OF CHARLESTON
PLANNING DEPARTMENT
915 QUARRIER STREET, SUITE 1
CHARLESTON, WV 25301**

Jay Aya-ay
Chief, Environmental Analysis Section
Department of the Army
Huntington District, Corps of Engineers
502 Eight Street
Huntington, WV 25701-2070

Dear Mr. Aya-ay,

At their monthly meeting on Thursday, August 18, 2011, the Charleston Historic Landmarks Commission reviewed the proposed stabilization project on the right descending bank of the Kanawha River between river miles 60 to 61 (approximately from the 35th Street Bridge to Greenbrier Street).

The Commission understands that the existing stone bank protection and steps, constructed by the WPA in the 1930s, are in extreme disrepair and threaten the stability of the river bank, recreational pathways and the Kanawha Boulevard. The CHLC also understands that multiple alternatives are being considered, but would like to express that they are in favor of options that most closely maintain existing conditions. Most important of which are the pedestrian trails. The Commission also recently reviewed an extension of the upper trail to Daniel Boone Park, and hopes that the connection is recognized by the Corp as it is at the edge of this proposed stabilization project.

Provided finalized plans are presented in the future, the Commission supports the project and concurred with the Corp's determination that the project will not have an adverse affect on historic properties.

Thank you for your investment in the City of Charleston.

Sincerely,

Geoffrey Plagemann
Neighborhood Planner
Staff Liaison to the Charleston Historic Landmarks Commission
City of Charleston Planning Department



From: Stafford, Susan LRH
To: "Plagemann, Geoffrey"
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)
Date: Monday, September 12, 2011 1:00:00 PM

Classification: UNCLASSIFIED
Caveats: NONE

Geoffrey,

Thank you for the response. I'm aware of the Riverfront Master Plan, but have not seen it. Do you know where I may obtain a copy? I would be fine with an electronic version.

As we review the alternatives, it appears we will most likely be completing the current project in a similar manner to Patrick Street to Magic Island. We will be retaining the pedestrian sidewalks in their current locations, segmentally limiting use during construction. In general terms, we are familiar with the planned improvements to the upper pedestrian sidewalk from the end of our project to Daniel Boone Park. Since we would not be removing or relocating the existing pedestrian sidewalks, the improvements to Daniel Boone Park should tie-in to our project. We foresee the most impacts to trail use on the lower pedestrian sidewalk with more limited disruption to the upper pedestrian sidewalk.

Thank you,

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

-----Original Message-----

From: Plagemann, Geoffrey [<mailto:geoffrey.plagemann@cityofcharleston.org>]
Sent: Monday, September 12, 2011 12:13 PM
To: Stafford, Susan LRH
Subject: Kanawha Riverbank Protection

Susan,

Attached is a response/approval letter from the Charleston Historic Landmarks Commission that went out last week regarding the Kanawha Riverbank Stabilization Project in Charleston. On behalf of the CHLC, we thank you for including us in this, and future, projects.

I also have a general question as one of Charleston's city planners: Is the Corp aware of the Riverfront Master Plan for the City of Charleston? With the substantial and quality work that the Corp has done on other stabilization projects, they would be an excellent partner in helping the City accomplish the long-range goals of the master plan.

I look forward to hearing from you.

Warm regards,

Geoffrey Plagemann

Neighborhood Planner

City of Charleston

CONFIDENTIALITY NOTE: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Classification: UNCLASSIFIED

Caveats: NONE

From: Stafford, Susan LRH
To: "[Plagemann, Geoffrey](mailto:Geoffrey.Plagemann@cityofcharleston.org)"
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)
Date: Monday, September 12, 2011 3:13:00 PM

Classification: UNCLASSIFIED
Caveats: NONE

Geoffrey,

Currently the USACE is conducting design work and the environmental assessment. At the present time, we do not have funding for construction. I therefore can't give you a timeframe to coordinate our efforts. I can forward the proposed landing/overlook at the end of Greenbrier Street to our lead engineer so he is aware of the proposed project. This is also something he may need to be made aware as part of his design at Greenbrier Street.

Thanks,

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

-----Original Message-----

From: Plagemann, Geoffrey [<mailto:geoffrey.plagemann@cityofcharleston.org>]
Sent: Monday, September 12, 2011 2:35 PM
To: Stafford, Susan LRH
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)

Susan,

This link should get you to a pdf copy of the plan:

http://www.charlestonwaterfrontnow.org/Portals/0/CharlestonWaterfrontNow/docs/Sasaki_Master_Plan_020806_Part1.pdf

(The site can be finicky, so if it doesn't work, let me know.)

As you will see, the plan calls for many improvements to the riverfront, but within the boundaries of the Corps improvements for river miles 60-61, there are two landings/overlooks at the ends of Greenbrier Street and Chesapeake Ave. While these are the City's "vision" it only makes sense to me that if the Corp is going to be working to improve these areas, so should we.

What is the Corps' timeline for this project?

Thanks,

Geoff

-----Original Message-----

From: Stafford, Susan LRH [<mailto:Susan.B.Stafford@usace.army.mil>]
Sent: Monday, September 12, 2011 1:02 PM
To: Plagemann, Geoffrey
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Geoffrey,

Thank you for the response. I'm aware of the Riverfront Master Plan, but have not seen it. Do you know where I may obtain a copy? I would be fine with an electronic version.

As we review the alternatives, it appears we will most likely be completing the current project in a similar manner to Patrick Street to Magic Island.

We will be retaining the pedestrian sidewalks in their current locations, segmentally limiting use during construction. In general terms, we are familiar with the planned improvements to the upper pedestrian sidewalk from the end of our project to Daniel Boone Park. Since we would not be removing or relocating the existing pedestrian sidewalks, the improvements to Daniel Boone Park should tie-in to our project. We foresee the most impacts to trail use on the lower pedestrian sidewalk with more limited disruption to the upper pedestrian sidewalk.

Thank you,

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

-----Original Message-----

From: Plagemann, Geoffrey [<mailto:geoffrey.plagemann@cityofcharleston.org>]
Sent: Monday, September 12, 2011 12:13 PM
To: Stafford, Susan LRH
Subject: Kanawha Riverbank Protection

Susan,

Attached is a response/approval letter from the Charleston Historic Landmarks Commission that went out last week regarding the Kanawha Riverbank Stabilization Project in Charleston. On behalf of the CHLC, we thank you for including us in this, and future, projects.

I also have a general question as one of Charleston's city planners: Is the Corp aware of the Riverfront Master Plan for the City of Charleston? With the substantial and quality work that the Corp has done on other stabilization projects, they would be an excellent partner in helping the City accomplish the long-range goals of the master plan.

I look forward to hearing from you.

Warm regards,

Geoffrey Plagemann
Neighborhood Planner
City of Charleston

CONFIDENTIALITY NOTE: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Classification: UNCLASSIFIED
Caveats: NONE

CONFIDENTIALITY NOTE:

This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have

received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Classification: UNCLASSIFIED
Caveats: NONE



August 31, 2011

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300

Randall Reid-Smith, Commissioner

Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562

EEO/AA Employer

Mr. Jay Aya-ay
Chief
US Department of the Army
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, WV 25701

RE: Emergency Stream Bank Protection Project
FR#: 11-1004-KA

Dear Mr. Aya-ay:

We have reviewed the above referenced project to determine its effects to cultural resources. As required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties," we submit our comments.

According to the submitted information, the US Department of the Army Corps of Engineers (USACE) is evaluating potential impacts of a proposed streambank protection project along the Kanawha River in Charleston, Kanawha County, WV. It is our understanding that recent high water and flood events have resulted in extensive stone and fill displacement and bank failure and retreat which is endangering US Route 60. It is also our understanding that six alternatives are being considered, including the No Action alternative.

Archaeological Resources:

According to our records, there are no known archaeological sites located within the proposed project area although one is located in close proximity. In addition, available information indicates the streambank has been impacted by previous activities, which makes it very unlikely that intact archaeological resources will be encountered. Of the alternatives proposed, it is our opinion that Alternative 1, 2, 3 and 6 will have no effect to any archaeological resources that may be eligible for inclusion in the National Register of Historic Places. If Alternative 4 or 5 is selected, both of which involve the relocation of US Route 60, existing utilities and recreational pathways, we will require additional information before we can provide comments regarding potential effects to significant archaeological resources. We will provide further comment upon notification that a preferred alternative has been selected. We look forward to continuing the consultation process.

Architectural Resources:

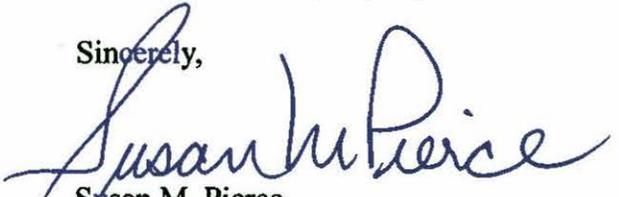
After review of the information provided, it is our understanding that six alternatives are being considered for a streambank protection project along the Kanawha Riverbank between Greenbrier Street and the 35th Street Bridge. This area of Kanawha Boulevard has been previously determined

August 31, 2011
Mr. Aya-ay
Fr#: 11-1004-KA
Page 2

eligible for the National Register of Historic Places under Criteria A and C and in order to determine the impact of the proposed project, we request that you submit additional information once an alternative has been chosen and we will provide further comment at that time.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the Section 106 process, please contact Lora A Lamarre-DeMott, Senior Archaeologist or Aubrey Von Lindern, Historian, at (304) 558-0240.*

Sincerely,



Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/LAL/ACV



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

August 1, 2011

RECEIVED

AUG 03 2011

WVFO

Planning Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Deborah Carter
Field Supervisor
US Fish and Wildlife Service
694 Beverly Pike
Elkins, WV 26241

Dear Ms. Carter:

The U.S. Army Corps of Engineers, Huntington District (District) is initiating scoping under the National Environmental Policy Act (NEPA) to assist the District in evaluating the potential impacts of a proposed streambank protection project along the Kanawha River within the city limits of Charleston, West Virginia. The study is being conducted under authority of Section 14 of the Rivers and Harbors Act of 1946, as amended. The Act authorizes the Corps of Engineers to plan and construct emergency streambank and shoreline protection projects to protect endangered highways, highway bridge approaches, and public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities.

The District is providing assistance to the City of Charleston, West Virginia with streambank erosion along the right descending bank of the Kanawha River between river mile 60 and 61. Recent high water and flood events have resulted in endangerment to US Route 60 which is a critically essential transportation route. Flood flow erosion and recession related piping of fill and alluvial soil have resulted in extensive stone and fill displacement and bank failure and retreat.



United States Department of the Interior

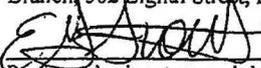
FISH AND WILDLIFE SERVICE



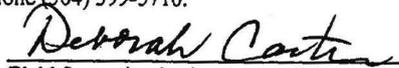
West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

In response to your letter above, we have made a "no effect" determination that the project will not affect federally-listed endangered or threatened species. Therefore no biological assessment or further section 7 consultation under the Endangered Species Act is required with the Fish and Wildlife Service. Should project plans change, or if additional information on listed and proposed species becomes available, this determination may be reconsidered.

Definitive determinations of the presence of waters of the United States, including wetlands, in the project area and the need for permits, if any, are made by the U.S. Army Corps of Engineers. They may be contacted at: Huntington District, Regulatory Branch, 502 Eighth Street, Huntington, West Virginia 25701, telephone (304) 399-5710.



Reviewer's signature and date 8/11/11



Field Supervisor's signature and date 8/11/2011

KANAWHA VALLEY HISTORICAL & PRESERVATION SOCIETY,
Inc. _____ 714 Peoples Building, Charleston, WV 25301
POB 2283, Charleston, WV 25328 * (304) 342-7676 * www.KVHPS.org

Susan Stafford
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, WV 25701

August 11, 2011

Re: Kanawha River right descending bank mile 60-61 protection project

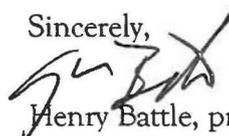
Dear Ms. Stafford:

The Kanawha Valley Historical & Preservation Society, Inc. is vitally interested in the historic integrity of the Kanawha Boulevard, including of course the maintenance of the Kanawha river banks. We are pleased with the past and now proposed future streambank repairs in the Boulevard area described in the letter of August 1, 2011 from Jay Aya-ay and . appreciate the opportunity to comment.

Our concern is with the visual impact of the proposal on the historic appearance of the Boulevard and associated riverbank. Since we not unfamiliar with the various alternatives suggested, we would like to have simple sketches of each alternative, including plan, elevation and cross-section views. You can reach us using the letterhead information. We will immediately review them and respond timely.

Thank you for the opportunity to participate - we believe the long-term stability of the Kanawha Boulevard, Charleston's defining work of infrastructure, is essential to the viability of the City.

Sincerely,



Henry Battle, president

From: Stafford, Susan LRH
To: "JW42346@frontier.com"
Subject: RE: Alternatives for the Greenbrier Street to 35th Street Project (UNCLASSIFIED)
Date: Thursday, August 25, 2011 7:21:00 AM

Classification: UNCLASSIFIED
Caveats: NONE

Good Morning,

I'm sorry I missed your call Tuesday afternoon. I have been out of town and unable to forward you the email information that I had originally sent to your old aol email address. If you have any questions, feel free to send an email or call.

Below are the detailed descriptions of proposed alternatives for the Greenbrier Street to 35th Street Emergency Streambank Protection Project in Charleston. I provided a very general description in a scoping letter that was sent out at the beginning of the month. Henry Battle requested the detailed information in an telephone conversation earlier in the week. We have completed preliminary evaluations, but are still in the early phases of project design.

C.1 Toe of Slope Stone Blanket with Upper Bank Trench Drains.

Requirements for the construction of this plan include the placement of granular bedding and filter material, a filter fabric (where necessary), and filter transition and stone blanket placed on the derrick stone and hydraulic fill on the lower bank slope and trench drains placed on the upper bank slope. The treatment would be approximately 5,400 feet in length and extend approximately 21 to 23 feet up the bank to a paved recreational pathway, and an additional 20 feet of trench drain placement would extend to the top of upper bank. The treatment would not include the 35th Street Bridge abutment and would extend to Greenbrier Street. The treatment would include bedding/filter material placed on the lower bank slope and filter fabric, where necessary. Excavation would be required in order to "key in" the fabric at the physical limits of the treatment as well as for constructing the upper bank trench drains. Durable stone, with a transitional filter component, would then be placed over the filter material on the lower bank slope. The stone would have an approximate top size of 15 inches, and the treatment would be 3 feet in depth. The upper bank trench drains would be encapsulated with filter fabric and backfilled with stone. Up and downriver transitions would be constructed to prevent outflanking of treatments. The sandstone block stairs would be stored on site for use by the City. Within disturbed areas adjacent to stone placement areas, a filter fabric, topsoil, and native grass seed mix would be placed to prevent erosion.

C.2 Gabions/Mat/Block.

Gabions would include rectangular baskets and mats made of steel wire filled with stone. The gabion structure would be keyed-in at the toe and the top of the bank and at transitions. This would require excavating trenches along the length and at up and down stream limits of the lower bank to be protected. Additionally, these gabion structures would require filter materials. Gabion structures would be built in the following configuration. The mats and gabions would be placed on a filter and underlying granular bedding material and hydraulic fill. The gabion baskets and mats would then be filled with stone 4 to 8 inches in diameter closed and secured.

C.3 Top of Bank Stone Blanket.

Stone placement from the normal pool to US Route 60 was evaluated. The District has evaluated upper slope conditions and determined that maintenance of vegetation cover with trench drains would provide sufficient slope protection.

C.4 Vegetative Cover.

Vegetative treatments cannot be implemented at this site due to continuing failures and erosion occurring along the river bank. Persistent groundwater seeps and frequent pool fluctuations preclude the establishment of vegetative treatment within defined limits. Excavating to stable slope geometries to allow placement of vegetation would require the relocation of the current recreational pathways and

US Route 60 and would not affect sufficient stability or be sustainable, or cost justifiable.

C.5 Relocation of Highway and Utilities.

This alternative consists of the relocation of existing recreational pathways and US Route 60. Relocation would include acquisition of real estate and relocation of utilities.

C.6 No Action Alternative

For the No Action alternative, the Corps of Engineers would not provide streambank stabilization for US Route 60 along the right descending bank of the Kanawha River between Greenbrier Street and the 35th Street Bridge. Erosion and bank failure would continue, and would extend upslope from the recreational pathway to US Route 60, unless stabilization treatments are installed. Some stabilization efforts have been conducted by the City of Charleston in an effort to address erosion features, such small scale efforts would be expected to continue. However, these limited stabilization projects do not effectively address erosion and recession related piping of fill and alluvial soil and would allow for continued stone and fill displacement, bank failure and retreat with eventual failure of US Route 60.

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Stafford, Susan LRH

From: Blankenship, Dottie [dottie.blankenship@cityofcharleston.org]
Sent: Thursday, August 25, 2011 9:43 AM
To: Stafford, Susan LRH
Subject: Proposed Streambank Protection Project

Ms. Stafford

Municipal Beautification Commission has been very pleased with the previous Streambank Protection Project between the Patrick Street Bridge and Magic Island. We would prefer that this design be continued for the section now under consideration between Greenbrier Street and the 35th Street Bridge.

Having the stone cover from the water edge to the lower sidewalk decreases the difficulty Public Ground employees have in keeping the rip rap free of weed trees and other vegetation.

Thank you,

Dottie Blankenship emailing for

Municipal Beautification Commission

Mary Jane Vanderwilt, Chairman

CONFIDENTIALITY NOTE: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.



**CITY OF CHARLESTON
PLANNING DEPARTMENT
915 QUARRIER STREET, SUITE 1
CHARLESTON, WV 25301**

Jay Aya-ay
Chief, Environmental Analysis Section
Department of the Army
Huntington District, Corps of Engineers
502 Eight Street
Huntington, WV 25701-2070

Dear Mr. Aya-ay,

At their monthly meeting on Thursday, August 18, 2011, the Charleston Historic Landmarks Commission reviewed the proposed stabilization project on the right descending bank of the Kanawha River between river miles 60 to 61 (approximately from the 35th Street Bridge to Greenbrier Street).

The Commission understands that the existing stone bank protection and steps, constructed by the WPA in the 1930s, are in extreme disrepair and threaten the stability of the river bank, recreational pathways and the Kanawha Boulevard. The CHLC also understands that multiple alternatives are being considered, but would like to express that they are in favor of options that most closely maintain existing conditions. Most important of which are the pedestrian trails. The Commission also recently reviewed an extension of the upper trail to Daniel Boone Park, and hopes that the connection is recognized by the Corp as it is at the edge of this proposed stabilization project.

Provided finalized plans are presented in the future, the Commission supports the project and concurred with the Corp's determination that the project will not have an adverse affect on historic properties.

Thank you for your investment in the City of Charleston.

Sincerely,

Geoffrey Plagemann
Neighborhood Planner
Staff Liaison to the Charleston Historic Landmarks Commission
City of Charleston Planning Department



From: Stafford, Susan LRH
To: "Plagemann, Geoffrey"
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)
Date: Monday, September 12, 2011 1:00:00 PM

Classification: UNCLASSIFIED
Caveats: NONE

Geoffrey,

Thank you for the response. I'm aware of the Riverfront Master Plan, but have not seen it. Do you know where I may obtain a copy? I would be fine with an electronic version.

As we review the alternatives, it appears we will most likely be completing the current project in a similar manner to Patrick Street to Magic Island. We will be retaining the pedestrian sidewalks in their current locations, segmentally limiting use during construction. In general terms, we are familiar with the planned improvements to the upper pedestrian sidewalk from the end of our project to Daniel Boone Park. Since we would not be removing or relocating the existing pedestrian sidewalks, the improvements to Daniel Boone Park should tie-in to our project. We foresee the most impacts to trail use on the lower pedestrian sidewalk with more limited disruption to the upper pedestrian sidewalk.

Thank you,

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

-----Original Message-----

From: Plagemann, Geoffrey [<mailto:geoffrey.plagemann@cityofcharleston.org>]
Sent: Monday, September 12, 2011 12:13 PM
To: Stafford, Susan LRH
Subject: Kanawha Riverbank Protection

Susan,

Attached is a response/approval letter from the Charleston Historic Landmarks Commission that went out last week regarding the Kanawha Riverbank Stabilization Project in Charleston. On behalf of the CHLC, we thank you for including us in this, and future, projects.

I also have a general question as one of Charleston's city planners: Is the Corp aware of the Riverfront Master Plan for the City of Charleston? With the substantial and quality work that the Corp has done on other stabilization projects, they would be an excellent partner in helping the City accomplish the long-range goals of the master plan.

I look forward to hearing from you.

Warm regards,

Geoffrey Plagemann

Neighborhood Planner

City of Charleston

CONFIDENTIALITY NOTE: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Classification: UNCLASSIFIED

Caveats: NONE

From: Stafford, Susan LRH
To: "[Plagemann, Geoffrey](mailto:Geoffrey.Plagemann@cityofcharleston.org)"
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)
Date: Monday, September 12, 2011 3:13:00 PM

Classification: UNCLASSIFIED
Caveats: NONE

Geoffrey,

Currently the USACE is conducting design work and the environmental assessment. At the present time, we do not have funding for construction. I therefore can't give you a timeframe to coordinate our efforts. I can forward the proposed landing/overlook at the end of Greenbrier Street to our lead engineer so he is aware of the proposed project. This is also something he may need to be made aware as part of his design at Greenbrier Street.

Thanks,

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

-----Original Message-----

From: Plagemann, Geoffrey [<mailto:geoffrey.plagemann@cityofcharleston.org>]
Sent: Monday, September 12, 2011 2:35 PM
To: Stafford, Susan LRH
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)

Susan,

This link should get you to a pdf copy of the plan:

http://www.charlestonwaterfrontnow.org/Portals/0/CharlestonWaterfrontNow/docs/Sasaki_Master_Plan_020806_Part1.pdf

(The site can be finicky, so if it doesn't work, let me know.)

As you will see, the plan calls for many improvements to the riverfront, but within the boundaries of the Corps improvements for river miles 60-61, there are two landings/overlooks at the ends of Greenbrier Street and Chesapeake Ave. While these are the City's "vision" it only makes sense to me that if the Corp is going to be working to improve these areas, so should we.

What is the Corps' timeline for this project?

Thanks,

Geoff

-----Original Message-----

From: Stafford, Susan LRH [<mailto:Susan.B.Stafford@usace.army.mil>]
Sent: Monday, September 12, 2011 1:02 PM
To: Plagemann, Geoffrey
Subject: RE: Kanawha Riverbank Protection (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Geoffrey,

Thank you for the response. I'm aware of the Riverfront Master Plan, but have not seen it. Do you know where I may obtain a copy? I would be fine with an electronic version.

As we review the alternatives, it appears we will most likely be completing the current project in a similar manner to Patrick Street to Magic Island.

We will be retaining the pedestrian sidewalks in their current locations, segmentally limiting use during construction. In general terms, we are familiar with the planned improvements to the upper pedestrian sidewalk from the end of our project to Daniel Boone Park. Since we would not be removing or relocating the existing pedestrian sidewalks, the improvements to Daniel Boone Park should tie-in to our project. We foresee the most impacts to trail use on the lower pedestrian sidewalk with more limited disruption to the upper pedestrian sidewalk.

Thank you,

Susan B. Stafford
U.S. Army Corps of Engineers
Huntington District
502 8th Street
Huntington, WV 25701
Telephone: (304) 399-5729

-----Original Message-----

From: Plagemann, Geoffrey [<mailto:geoffrey.plagemann@cityofcharleston.org>]
Sent: Monday, September 12, 2011 12:13 PM
To: Stafford, Susan LRH
Subject: Kanawha Riverbank Protection

Susan,

Attached is a response/approval letter from the Charleston Historic Landmarks Commission that went out last week regarding the Kanawha Riverbank Stabilization Project in Charleston. On behalf of the CHLC, we thank you for including us in this, and future, projects.

I also have a general question as one of Charleston's city planners: Is the Corp aware of the Riverfront Master Plan for the City of Charleston? With the substantial and quality work that the Corp has done on other stabilization projects, they would be an excellent partner in helping the City accomplish the long-range goals of the master plan.

I look forward to hearing from you.

Warm regards,

Geoffrey Plagemann
Neighborhood Planner
City of Charleston

CONFIDENTIALITY NOTE: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Classification: UNCLASSIFIED
Caveats: NONE

CONFIDENTIALITY NOTE:

This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have

received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Classification: UNCLASSIFIED
Caveats: NONE



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

October 14, 2011

Mr. Jay Aya-ay
Chief, Environmental Analysis Section
Department of the Army
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701-2070

Dear Mr. Aya-ay:

Thank you for your letter, dated September 19, 2011, concerning your proposed streambank restoration protection project along the Kanawha River in Charleston, generally between Greenbrier Street and the 35th Street Bridge (CR 60/63).

The West Virginia Division of Highways (WVDOH) is proceeding with the implementation of a shared path along US 60 from the 35th Street Bridge to Daniel Boone Park. Generally, the scope of this project will involve the construction of a seven-foot wide concrete path adjacent to the south (River) side of US 60 beginning directly underneath the downstream/western end of the 35th Street Bridge and extending to the entrance to the Daniel Boone Park. Minor grading along the access road that connects US 60 to the lower sidewalk parallel to the River, from the western side of the 35th Street Bridge to US 60, a retaining wall between the 35th Street Bridge and the 36th Street Bridge (CR 60/62) and two retaining walls between the 36th Street Bridge and the Moose Lodge, as well as utility relocations, also are proposed. The WVDOH can provide you with preliminary plans regarding this project, if desired.

Your coordination efforts regarding this matter are appreciated. Should you require additional information, please contact Mr. David E. Cramer, P. E., of our Commissioner's Office of Economic Development, at (304) 558-9211.

Sincerely,

A handwritten signature in cursive script that reads "Paul A. Mattox, Jr.".

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

PAM:Cm



REPLY TO
ATTENTION OF

Department of the Army
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

July 5, 2012

Planning, Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Susan Pierce
Deputy State Historic Preservation Officer
WV Division of Culture and History
1900 Kanawha Boulevard, E.
Charleston, West Virginia 25305-0300

Dear Ms. Pierce:

In accordance with 36 CFR 800.4(a)(3), the U.S. Army Corps of Engineers, Huntington District (District) has sought project input for the Section 14 Streambank Protection Project Kanawha River 35th Street to Greenbrier Street through initial project scoping. Interested parties have requested the District move forward with the project in a manner that most closely mimics existing conditions. Interested parties have also stated that they are pleased with the results of a previous stone slope protection project conducted approximately three (3) miles downstream of the current project (Patrick Street to Magic Island) and would like to see similar results with the current project. The Patrick Street to Magic Island project removed seven sets of lower stairs that are eligible for the National Register of Historic Places (NRHP) as a contributing element to Kanawha Boulevard. Two of the sets were rebuilt, while the remaining stairs were either repurposed as benches along the lower bank pathway or stockpiled by the city for future use.

Pursuant to 36 CFR 800.4(b)(3), initial research and project scoping has resulted in the determination that there will be no effect to archaeological resources that may be eligible for inclusion in the NRHP as long as an alternative not requiring the relocation of Kanawha Boulevard is selected. Alternative selection that would result in a relocation of Kanawha Boulevard would require additional coordination with your office. Kanawha Boulevard, which was originally constructed by the Public Works Administration (PWA), is considered eligible for the NRHP under Criterion A and C. The Boulevard includes the road, the upper and lower bank pathways, the existing derrick stone, and upper and lower bank stairs.

The District has screened project alternatives based upon constructability, an analysis of the Patrick Street to Magic Island project, project cost, and input from project scoping. The District has selected Toe of Slope Stone Blanket as the recommended alternative. The District feels the recommended alternative provides the most effective protection for Kanawha Boulevard. This alternative includes the placement of granular bedding and filter material, a filter fabric (where necessary), filter transition and stone blanket encapsulating the original PWA derrick stone on the lower bank slope. The treatment will be approximately 5,400 feet long and extend along the lower bank to the lower bank pathway. A profile and plan view of this alternative has been enclosed for your reference.

In accordance with 36 CFR 800.5(a)(1), the District has determined that the project will have an adverse effect lower bank stairs that lead from the lower pathway to the Kanawha River. The lower stairs include nine (9) sets within the 5,400 foot project reach in various stages of disrepair. The disrepair is due to lack of maintenance as well as the inability of water to freely discharge from underneath the stairs. Water is forced to escape around the stairs causing them to degrade and misalign as well as create voids and subsequent instability in the surrounding stone slope protection. This degradation and misalignment is visible within the original PWA stair placement as well as the rebuilt lower bank stairs implemented as part of the previously constructed stabilization measures along the lower bank, extending from Patrick Street to Magic Island.

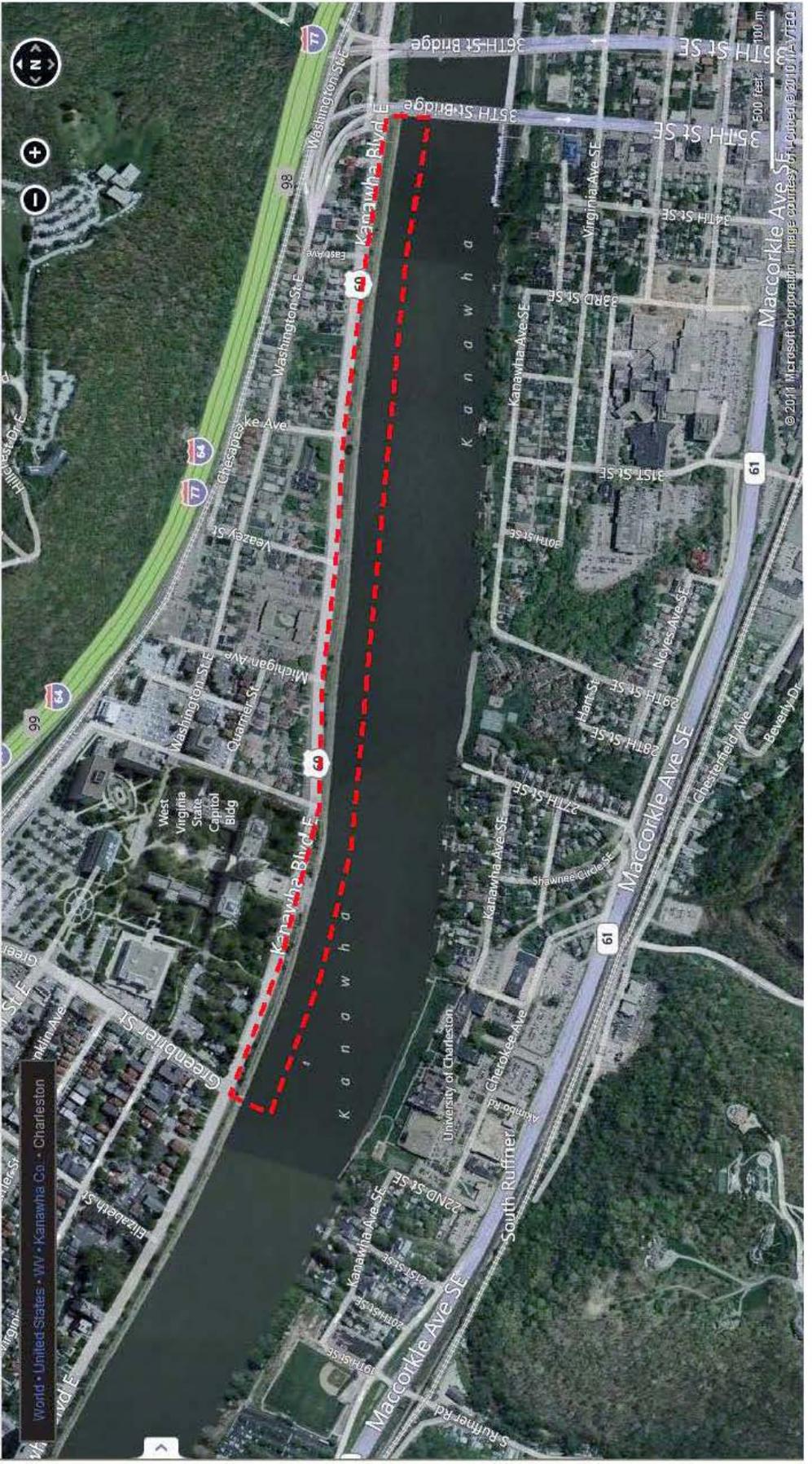
Pursuant to 36 CFR 800.6(a), the District would like to continue working with SHPO and other interested parties to resolve the adverse effect to Kanawha Boulevard. The District proposes dismantling the lower bank stairs and incorporating a minimum of five (5) and a maximum of ten (10) benches along the lower bank pathway from the dismantled stairs. The remaining stairs would be stockpiled by the city for future use. The District also proposes to mitigate the adverse effect through the placement of an interpretative sign along the upper pathway that provides a brief history of the PWA and their involvement in the construction of Kanawha Boulevard.

Please submit any comments to my attention within 30 days of receipt of this letter. If questions arise when reviewing the enclosed attachments, please do not hesitate to contact Susan Stafford of my staff at 304-399-5729 or by email at Susan.B.Stafford@usace.army.mil.

Sincerely,

Jay Aya-ay
Chief, Environmental Analysis Section

Enclosures



World • United States • WV • Kanawha Co. • Charleston

500 feet
100 m
© 2017 Microsoft Corporation. Image courtesy of Google/AVIATION

Mailing List

Susan Pierce
Deputy State Historic Preservation Officer
State Historic Preservation Office
1900 Kanawha Boulevard, E.
Charleston, West Virginia 25305-0300

Ric Cavendar, Executive Director
East End Main Street
1116 Smith Street #213
Charleston, WV 25301-1314

Geoffrey Plagemann
Neighborhood Planner
Staff Liaison to the Charleston Historic Landmarks Commission
City of Charleston Planning Department
915 Quarrier Street, Suite 1
Charleston, WV 25301

Henry Battle, President
Kanawha Valley Historical & Preservation Society, Inc.
P.O. Box 2283
Charleston, WV 25328

Mary Jane Vanderwilt
Municipal Beautification Commission
1208 Upper Ridgeway Road
Charleston, WV 25322

Ms. Louise Dunford Brodnitz
Program Analyst, Office of Federal Agency Programs
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004



DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

July 5, 2012

Planning, Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Ms. Louise Dunford Brodnitz
Program Analyst, Office of Federal Agency Programs
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

RE: USACE Determination of Adverse Effect to Historic Properties from the Kanawha River 35th Street Bridge to Greenbrier Street CAP Section 14 Emergency Stream Bank Protection Project, Charleston, West Virginia

Dear Ms. Dunford Brodnitz:

Pursuant to 36 CFR 800.6(a)(1), I am writing to notify you that the above-referenced undertaking will have an adverse effect to a historic property. The USACE is providing assistance to the City of Charleston, West Virginia with streambank erosion along the right descending bank of the Kanawha River between river mile 60 and 61. The undertaking is being conducted under authority of Section 14 of the Rivers and Harbors Act of 1946, as amended. The Act authorizes the Corps of Engineers (USACE) to plan and construct emergency streambank and shoreline protection projects to protect endangered highways, highway bridge approaches, and public facilities such as water and sewer lines, churches, public and private nonprofit schools and hospitals, and other nonprofit public facilities.

Recent high water and flood events have resulted in endangerment to US Route 60 (Kanawha Boulevard) which is a critically essential transportation route. Flood flow erosion and recession related piping of fill and alluvial soil have resulted in extensive stone and fill displacement with subsequent bank failure and retreat.

The existing displaced stone is associated with Kanawha Boulevard, which was originally constructed by the Public Works Administration (PWA) and is considered eligible for the NRHP under Criterion A and C. The Boulevard includes the road, the upper and lower bank pathways, the existing derrick stone, and upper and lower bank stairs. Projects constructed under this authority did not require maintenance and no agreements were effected with local interests. Since construction, extensive flood related bank failure and erosion has outflanked this treatment and continually caused loss of bank material and derrick stone.

The USACE has evaluated several alternatives based upon constructability, an analysis of the Patrick Street to Magic Island project which has recently been completed approximately three miles downstream of the proposed undertaking, project cost, and input from project scoping. The USACE has selected Toe of Slope Stone Blanket as the recommended alternative. The USACE feels the recommended alternative provides the most effective protection for Kanawha Boulevard. This alternative includes the placement of granular bedding and filter material, a filter fabric (where

necessary), filter transition and stone blanket encapsulating the original WPA derrick stone on the lower bank slope. The treatment would be approximately 5,400 feet long and extend along the lower bank to the lower bank pathway. As part of the treatment, the lower bank stairs will be removed. A profile and plan view of this alternative has been enclosed for your reference.

In accordance with 36 CFR 800.5(a)(1), the USACE has determined that the project will have an adverse effect lower bank stairs that lead from the lower pathway to the Kanawha River. The lower stairs include nine (9) sets within the 5,400 foot project reach in various stages of disrepair. The disrepair is due to lack of maintenance as well as the inability of water to freely discharge from underneath the stairs. Water is forced to escape around the stairs causing them to degrade and misalign as well as create voids and subsequent instability in the surrounding stone slope protection. This degradation and misalignment is visible within the original PWA stair placement as well as the rebuilt lower bank stairs implemented as part of the previously constructed stabilization measures along the lower bank, extending from Patrick Street to Magic Island.

In accordance with 36 CFR 800.6(a) and 800.6(b)(1), the USACE is continuing consultation to resolve the adverse effect with the West Virginia State Historic Preservation Office (WVSHPO) and the City of Charleston. The USACE is also soliciting input from the Charleston Landmarks Commission, the City of Charleston Beautification Commission, and the Kanawha Valley Historic Society, all of which were active participants during project scoping. The USACE is also soliciting input from East End Main Street which includes the East End Historic District and borders Kanawha Boulevard along the project area reach.

It is anticipated that the adverse effect can be resolved through the execution of a Memorandum of Agreement (MOA) as described in 36 CFR 800.6(c) among the USACE, the City of Charleston and the WVSHPO. The MOA would require the execution of an agreed upon mitigation plan.

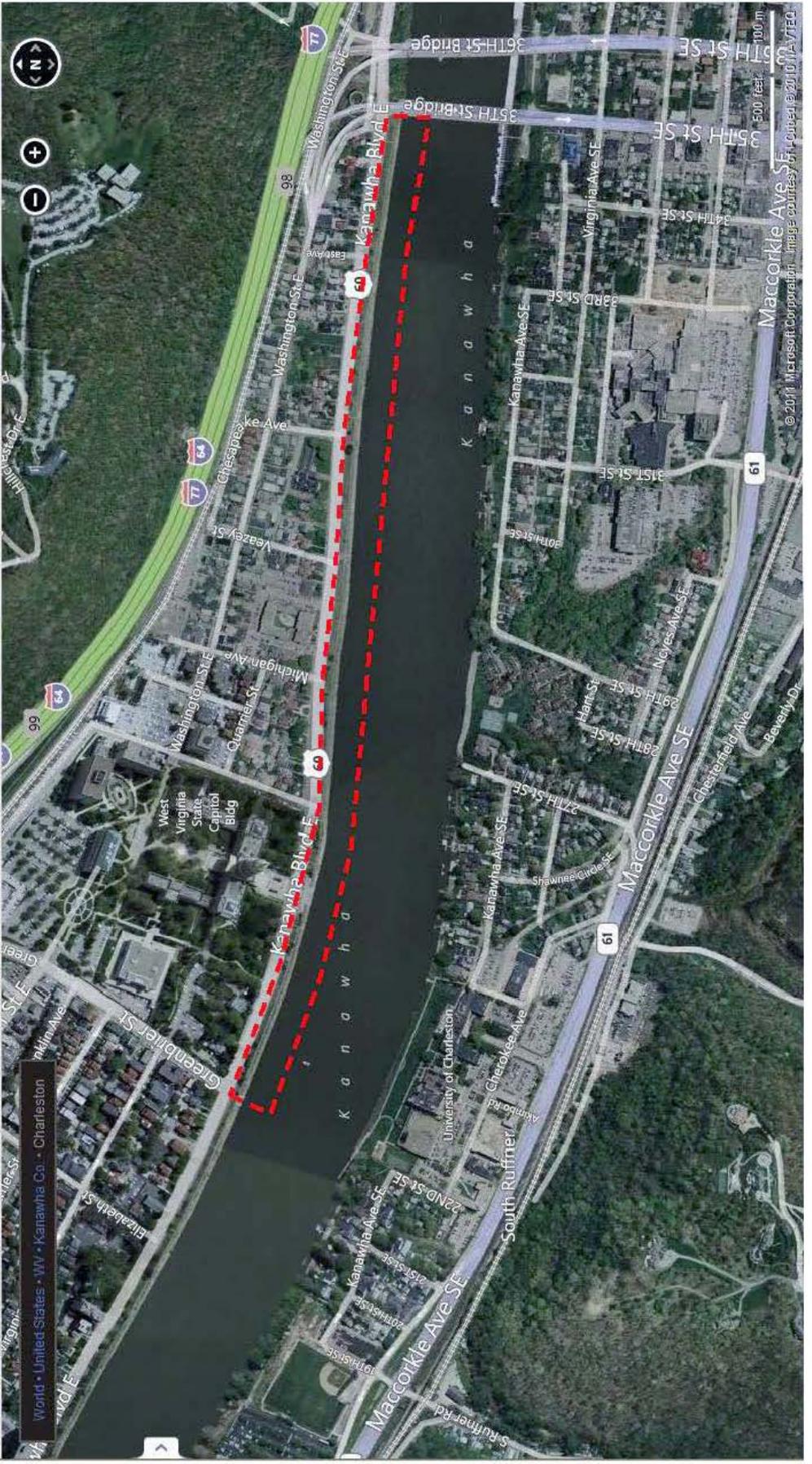
In accordance with 36 CFR 800.6(a)(1)(iii), I request that the ACHP advise the USACE within 15 days of receipt of this notice as to whether it will participate in consultation to resolve adverse effects. If I do not receive notice in that time frame, the USACE shall continue to consult to resolve adverse effects in accordance with 36 CFR 800.6(b)(1). If questions arise when reviewing the enclosed attachments, please do not hesitate to contact Susan Stafford of my staff at 304-399-5720 or Susan.B.Stafford@usace.army.mil.

Sincerely,

AYA-AY PD-R

Jay Aya-ay
Chief, Environmental Analysis Section

Enclosures



World • United States • WV • Kanawha Co. • Charleston

100 m
500 feet
© 2017 Microsoft Corporation. Image courtesy of Bing.com/Map/VELOCITY/



August 6, 2012

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300

Randall Reid-Smith, Commissioner

Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562

EEO/AA Employer

Mr. Jay Aya-ay
Chief
Dept. of the Army
Huntington District, COE
502 Eighth Street
Huntington, WV 25701

RE: Bank Stabilization Project – Kanawha River from 35th Street to Greenbrier Street
FR#: 12-958-KA

Dear Mr. Aya-ay:

We have reviewed the information submitted for above referenced project to determine its effects to cultural resources. As required by Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties," we submit our comments.

According to the submitted information, Huntington District COE is proposing a streambank protection project along the Kanawha River from 35th Street to Greenbrier Street.

Architectural Resources

Submitted information indicates that "interested parties have also stated that they are pleased with the results of a previous stone slope protection project conducted ...downstream of the current project (Patrick Street to Magic Island) and would like to see similar results with the current project." Please note that in the last correspondence we have regarding that particular project (07-1560-KA-3), we had requested the completion of a Memorandum of Agreement (MOA) for the adverse effect that the project would have on eligible resources. We can find no response from your organization relating to this request or a draft MOA for the project. Thus, the Section 106 review process for that project has not been completed. Please advise this office regarding the completion of the Section 106 review process for the Patrick Street to Magic Island project.

With regards to the current project, the Corps of Engineers proposes to encapsulate the original PWA derrick stone on the lower bank slope as well as dismantle nine sets of stairs. It is your opinion that this would result in an adverse effect to the eligible resources. We concur with this assessment; however, before proceeding to a Memorandum of Agreement (MOA), we will require additional information. While your submission indicates that an analysis of the project and project costs have been evaluated, your current submission does not include that

August 6, 2012
Mr. Aya-ay
FR#: 12-958-KA
Page 2

information. We request that it be forwarded at this time. In addition, federal regulations in 36 CFR 800.6(a) states that with regards to resolutions of adverse effect that “[T]he agency official shall consult with the SHPO/THPO and other consulting parties...to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties.” Could the project be designed in such a way to retain the eligible components or most of the eligible components? If you have studies regarding why these details cannot be retained, please forward them at this time. In addition, please forward photographs of the existing condition of all components that will be impacted by this project as well as photographs from the referenced Patrick Street to Magic Island alterations that have occurred.

Public Comments

We are in receipt of a letter from the Kanawha Valley Historical & Preservation Society, Inc voicing strong concern regarding this project. We request that all information that we have requested above also be forwarded to that organization at the same time that it is submitted to us. In addition to this interested party, we also request that in accordance with 36 CFR 800.2(d)(1), 800.2(d)(2), 800.3(e), 800.6(a)(4) that you contact the Charleston Historic Landmarks Commission. Its contact information is below:

Charleston HLC
Planning Department
915 Quarrier St.
Charleston, WV 25302
Current contact: Geoffrey Plagemann

Archaeological Resources:

Submitted information indicates that there are no archaeological resources within the project area. We concur with this determination; however, if intact deposits are encountered, we ask to be notified.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the Section 106 process, please contact or Shirley Stewart Burns, Structural Historian, in the Historic Preservation Office at (304) 558-0240.*

Sincerely,



Susan M. Pierce
Deputy State Historic Preservation Officer



Preserving America's Heritage

July 27, 2012

Mr. Jay Aya-ay
Chief, Environmental Analysis Section
Planning, Programs and Project Management Division
Huntington District, Corps of Engineers
502 Eighth Street
Huntington, WV 25701-2070

**REF: *Proposed Kanawha River Stream Bank Protection Project
Charleston, West Virginia***

Dear Mr. Aya-ay:

On July 9, 2012, the Advisory Council on Historic Preservation (ACHP) received your notification for the referenced project which was submitted in accordance with Section 800.6(a)(1) of our regulations, "Protection of Historic Properties" (36 CFR Part 800). Unfortunately, the background documentation included with your submission does not meet the specifications listed in Section 800.11(e). We, therefore, are unable to determine whether Appendix A of the regulations, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, applies to this undertaking. Accordingly, we request that you submit the following information so that we can determine whether our participation is warranted.

- Copies or summaries of any views provided by consulting parties and the public, including comments from Indian tribes, and the West Virginia State Historic Preservation Officer (SHPO).

Upon receipt of the additional information, we will notify you within 15 days of our decision. If you have any questions or require further assistance, please contact Louise Brodnitz at 202-606-8527, or via email at lbrodnitz@achp.gov.

Sincerely,

Raymond V. Wallace
Historic Preservation Technician
Office of Federal Agency Programs

The Kanawha Valley Historical & Preservation Society, Inc.

POB 2283
Charleston, West Virginia 25328
304 342-7676

Jay Aya-ay
Dep't of the Army, Corps of Engineers, Huntington District
502 Eighth Street, Huntington, WV 25701

July 26, 2012

Re: Section 14 Streambank Protection Project Kanawha River,
right descending bank U S Rte 60, Charleston WV 35th St to Greenbrier St.

Dear Mr. Ay-ay:

The Kanawha Valley Historical & Preservation Society, Inc. is vitally interested in the historic integrity of Charleston's Kanawha Boulevard, including of course the maintenance of the Boulevard's supporting river banks.

The section of the Boulevard now under consideration forms the southern boundary of a densely populated historic residential area as well as the State Capitol Complex. The roadway was designed over 70 years ago as a practical, intentionally utilitarian work of beauty and remains so today. An essential part of that utility for the public has been direct river access for fishing, boat, swimming (yes, swimming - a lot more palatable than it was 70 years ago) and the like. Your idea of "dismantling the lower bank stairs" and entirely removing historical river access for more than a mile does severe injury to the traditional utility of the structure, particularly to the local residents.

As you mentioned, the Corps managed to save and reconstruct lower bank stairs in the previously stabilized portion of the Boulevard. We understand and accept the practical considerations in the matter, but we believe at least three of the present nine must remain, either as rebuilt or as constructed from the materials from the removed six.

Our concern is with the visual impact of the stair-removal proposal as well. That section of the Kanawha Boulevard is probably seen by more Charleston visitors than any other due to the adjacency of the State Capitol Complex. Loss of the lower stairs destroys historic appearance and rhythm of the architect's plan associated with Cass Gilbert's riverfront structure.

Thank you for the opportunity to participate - we believe the long-term stability of the Kanawha Boulevard, Charleston's defining work of infrastructure, is essential to the viability of the City.

Sincerely,



Henry Battle, president

cc: Charleston Historic Landmarks Commission
WV State Historic Preservation Office



Department of the Army
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070
August 31, 2012

Planning, Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Susan Pierce
Deputy State Historic Preservation Officer
WV Division of Culture and History
1900 Kanawha Boulevard, E.
Charleston, West Virginia 25305-0300

RE: USACE Determination of Adverse Effect to Historic Properties from the Kanawha River 35th Street Bridge to Greenbrier Street CAP Section 14 Emergency Stream Bank Protection Project, Charleston, West Virginia (FR# 12-958-KA)

Dear Ms. Pierce:

The US Army Corps of Engineers, Huntington District (District) has provided correspondence to your office on two separate occasions regarding the Kanawha River 35th Street Bridge to Greenbrier Street CAP Section 14 Emergency Stream Bank Protection Project (FR# 12-958-KA). The District initiated consultation with your office, as well as, local groups during project scoping by letter dated 1 August 2011. The letter included the locations of both the current project and the previously constructed Patrick Street to Magic Island project, proposed construction work limits, and a mailing list. Initial scoping listed five design alternatives, as well as the no action alternative. During project scoping, the existing stone slope protection, which is associated with Kanawha Boulevard, was assumed to have been built by the Works Progress Administration (WPA), and considered eligible for the National Register of Historic Places under Criterion A and C. The District received several scoping responses concerning the existing stone slope protection which are bulleted below:

- The Kanawha Valley Historical & Preservation Society, Inc. issued a response on 11 August 2011 stating that they are pleased with the past streambank repairs as well as the proposed project. They expressed concern over the visual impact of the project and requested a detailed description of the proposed alternatives and a typical section of the preferred alternative once an alternative is selected.
- The City of Charleston Municipal Beautification Commission issued a response on 25 August 2011 stating that they are pleased with the previous Streambank Protection Project between the Patrick Street Bridge and Magic Island and would prefer to see the same design for the proposed project.
- The Charleston Historic Landmarks Commission issued a response on 12 September 2011 stating that they felt there would be no adverse effect to historic properties as part of

the undertaking. They also stated that they are in favor of alternatives most closely maintaining existing conditions and are most concerned with impacts to the existing recreational pathways.

- The WVSHPO issued a response on 31 August 2011 stating that it is very unlikely that intact archaeological sites will be encountered. There will be no effect to archaeological resources that may be eligible for inclusion in the NRHP as long as an alternative not requiring the relocation of Kanawha Boulevard is selected. A relocation of Kanawha Boulevard would require additional coordination. Kanawha Boulevard within the project area is eligible for the NRHP under Criterion A and C. Additional information on project impacts to Kanawha Boulevard is required once an alternative is selected.
- The West Virginia Division of Highways (WVDOH) issued a response letter on 14 October 2011. They did not express concerns with the project, but stated that they are implementing a shared path along Kanawha Boulevard from 35th Street to Daniel Boone Park. This path is an extension of the upper pathway starting at the eastern terminus of the project. The WVDOH also provided an electronic copy of the original plans for the Boulevard which credits the Public Works Administration (PWA) rather than the WPA as the agency responsible for the Boulevard's construction.

Post project scoping, the District conducted a detailed analysis of the current project area as well as the previous project from Patrick Street to Magic Island. The District identified Toe of Slope Stone Blanket as the preferred alternative. This alternative was also the selected alternative for the Patrick Street to Magic Island Project, but unlike that project, an engineering analysis determined that the placement of the original PWA stairs on top of the new treatment is not feasible. A second letter was submitted to your office, as well as parties that responded to initial project scoping, on 5 July 2012. The letter included the proposed construction work limits, a typical section of the proposed design, and a mailing list. The letter summarized the initial engineering analysis related to the original and rebuilt stairs. The letter stated that:

“(D)isrepair is due to lack of maintenance as well as the inability of water to freely discharge from underneath the stairs. Water is forced to escape around the stairs causing them to degrade and misalign as well as create voids and subsequent instability in the surrounding stone slope protection. This degradation and misalignment is visible within the original PWA stair placement as well as the rebuilt lower bank stairs implemented as part of the previously constructed stabilization measures along the lower bank, extending from Patrick Street to Magic Island.”

Pursuant to 36 CFR 800.5(a)(1), the July letter stated that the loss of the original PWA stairs results in an adverse effect to Kanawha Boulevard. The letter informed the WVSHPO, interested parties, and the Advisory Council on Historic Preservation of the adverse effect. The letter also proposed mitigation for the adverse effect through:

“dismantling the lower bank stairs and incorporating a minimum of five (5) and a maximum of ten (10) benches along the lower bank pathway from the dismantled stairs. The remaining stairs would be stockpiled by the city for future use. The District also

proposes to mitigate the adverse effect through the placement of an interpretative sign along the upper pathway that provides a brief history of the PWA and their involvement in the construction of Kanawha Boulevard.”

The July letter was distributed to all of the parties that responded to initial project scoping, including East End Main Street organization, which did not respond to initial scoping, but includes the East End Historic District which borders Kanawha Boulevard adjacent to the project area reach. The only responses received from the 5 July 2012 letter are bulleted below:

- The ACHP has requested additional information pursuant to 36 CFR 800.11(e) prior to determining if their participation is warranted.
- The Kanawha Valley Historical & Preservation Society, Inc. understands the practical considerations stated that the July letter, but questioned the loss of utility for local residents associated with the loss of the lower stairs as well as the visual impacts associated with stair removal. The Society noted that the District was able to rebuild two (2) of eleven (11) sets of lower stairs from Patrick Street to Magic Island and requested that the District rebuild three (3) of the nine (9) sets of lower stairs that are proposed to be dismantled as part of the preferred alternative.
- The WVSHPO stated that the removal of the lower stairs from Patrick Street to Magic Island also resulted in an adverse effect and that a Memorandum of Agreement (MOA) was not completed. The response concurs that the preferred alternative will result in an adverse effect and requested additional information before resolving the adverse effect. Requested information included analysis of project and project costs, design possibilities to retain historic components, photographs of existing components that will be impacted, and photographs of alterations to Patrick Street to Magic Island. A request was also made to forward requested information to the Kanawha Valley Historical & Preservation Society, Inc. and to contact the Charleston Historic Landmarks Commission.

The following information is provided to address your comments regarding the previously constructed project from Patrick Street to Magic Island. Originally, this project was designed to encapsulate the original Kanawha Boulevard features that were to be impacted by the project. This encapsulation was intended to include the existing stone slope protection and the lower stairs. Two of the sets of lower stairs were not to be encapsulated, but instead rebuilt on top of the new stone slope protection. Since original features were to be encapsulated or rebuilt, the District and WVSHPO concurred there would be no adverse effect to Kanawha Boulevard. This determination and design was included in the final Environmental Assessment. Upon initiation of project construction, the City of Charleston and the District determined that stones surrounding existing storm drains and the lower stairs required removal and would be repurposed. The District Archeologist coordinated the change in project design with WVSHPO on 4 February 2010 stating that the District felt the modification in design did not result in an adverse effect. WVSHPO responded on 22 February 2010 stating that the modifications would result in an adverse effect and required a MOA. Though there is some recollection amongst District staff that subsequent coordination with WVSHPO occurred, there are no records documenting this correspondence. Therefore, per our records, and pursuant to 36 CFR

800.5(c)(2)(i), the disagreement with the finding did not appear to fully resolved and a MOA was not completed.

Per your request, a summary of project alternatives and associated costs has been provided as an attachment. Also attached is the District's engineering analysis of the existing and rebuilt PWA stairs. The analysis provides information concerning design failures associated with the inability of water to freely discharge behind the stairs which causes piping and outflanking. The results of such piping and outflanking are stair misalignment and void formation. Due to these failures related to water discharge, the District's engineering analysis determined that design possibilities associated with retaining the stairs are not feasible. Photographs illustrating the location of the existing stairs, as well as a photograph of each set of existing stairs and the rebuilt stairs at Patrick Street to Magic Island have been included following the engineering analysis.

Your letter also requested coordination with the Charleston Historic Landmarks Commission. The District coordinated with the Commission through initial project scoping, as well as the adverse effects determination. A response was received during project scoping which is summarized on page one. The District will re-coordinate with the Charleston Historic Landmarks Commission, the Kanawha Valley Historical & Preservation Society, Inc., local groups, and the larger public through the issuance of the draft environmental assessment. This letter will also be copy furnished to the Kanawha Valley Historical & Preservation Society, Inc.

The District is requesting concurrence on the proposed mitigation for the preferred alternative which would include dismantling the lower bank stairs and incorporating a minimum of five (5) and a maximum of ten (10) benches along the lower bank pathway from the dismantled stairs. The remaining stairs would be stockpiled by the city for future use. The District also proposes to mitigate the adverse effect through the placement of an interpretative sign along the upper pathway that provides a brief history of the PWA and their involvement in the construction of Kanawha Boulevard.

The final alternative will be selected from the five (5) build and no build alternative after the thirty (30) day public review. Final selection will take into account comments received from the public review as well as comments received from prior correspondence concerning the adverse effect to the Kanawha Boulevard.

Please submit any comments to my attention within 30 days of receipt of this letter. If questions arise when reviewing the enclosed attachments, please do not hesitate to contact Susan Stafford of my staff at (304) 399-5729 or by email at Susan.B.Stafford@usace.army.mil.

Sincerely,



Jay Aya-ay
Chief, Environmental Analysis Section

Enclosures

ATTACHMENT

Project Alternatives and Associated Costs

Gabions/Mat/Block

Gabions would include rectangular baskets and mats made of steel wire filled with stone. The gabion structure would be keyed-in at the toe and the top of the bank and at transitions. This would require excavating trenches along the length and at up and down stream limits of the lower bank to be protected. Additionally, these gabion structures would require filter materials. Gabion structures would be built in the following configuration. The mats and gabions would be placed on a filter and underlying granular bedding material and hydraulic fill. The gabion baskets and mats would then be filled with stone four to eight inches in diameter closed and secured. The estimated cost of this alternative is \$2,650,000. This alternative is expected to result in greater environmental effects than the recommended alternative, offering similar utility and was therefore removed from further consideration.

Top of Bank Stone Blanket

Stone placement from the Kanawha River to Kanawha Boulevard was evaluated. This alternative would cost \$3,200,000. The District has evaluated upper slope conditions and determined that maintenance of vegetation cover would provide sufficient slope protection and was therefore removed from further consideration.

Vegetative Cover

Vegetative treatments cannot be implemented at this site due to continuing failures and erosion occurring along the river bank. Persistent groundwater seeps and frequent pool fluctuations preclude the establishment of vegetative treatment within defined limits. Excavating to stable slope geometries to allow placement of vegetation would require the relocation of the current recreational pathways and Kanawha Boulevard and would not result in sufficient stability, be sustainable, or cost effective and was therefore removed from further consideration.

Relocation of Highway and Utilities

This alternative consists of the relocation of existing recreational pathways and Kanawha Boulevard. Relocation would include acquisition of real estate and relocation of utilities. Cost for relocation is estimated to be \$10,270,000. This alternative protects Kanawha Boulevard but at higher cost and therefore does not meet the cost-effectiveness objective of the project. It is expected to result in greater environmental effects than the proposed, offering similar utility and was therefore removed from further consideration.

Toe of Slope Stone Blanket (Proposed Action Alternative)

Requirements for the construction of this plan include the placement of granular bedding and filter material; a filter fabric, (where necessary; filter transition and stone blanket on the derrick stone; and hydraulic fill on the lower bank slope. The treatment would be approximately 5,400 feet long and extend approximately 21 to 23 feet up the bank to a paved recreational pathway. The lateral extent of treatment would occur from Greenbrier Street and would stop shortly before the 35th Street Bridge abutment. Durable stone, with a transitional filter component, would then

be placed over the filter material on the lower bank slope. The stone would have an approximate maximum size of 15 inches, and the treatment would be three feet thick. Up and downriver transitions would be constructed to prevent the outflanking of treatments. The lower bank stairs would be removed in order to avoid leaving discontinuities in the bank protection. The sandstone block stairs would be removed and stored by the City for later use. Within disturbed areas adjacent to stone placement areas, a filter fabric, topsoil, and native grass seed mix would be placed to prevent erosion. The estimated cost of this alternative is \$2,059,000.

No Action Alternative

For the No Action Alternative, USACE would not provide streambank stabilization for Kanawha Boulevard along the right descending bank of the Kanawha River between Greenbrier Street and the 35th Street Bridge. Erosion and bank failure would continue, and would extend upslope to the roadway, unless stabilization treatments are installed. Some stabilization efforts have been conducted by the City of Charleston in an effort to address erosion features, such small scale efforts would be expected to continue. However, these limited stabilization projects do not effectively address erosion and recession related piping of fill and alluvial soil and would allow for continued stone and fill displacement, bank failure and retreat with eventual failure of Kanawha Boulevard.

ATTACHMENT

Engineering Analysis of the PWA Stairs

MEMORANDUM FOR RECORD

SUBJECT: Charleston WV Section 14 Project Risk with Inclusion of Historic Stair Rebuild

Flood and high river stage bank soil (hydraulic fill) saturation and groundwater recharge of banks between 35th Street to Greenbrier Avenue have resulted in extensive erosion and failure related endangerment of US Route 60. During Kanawha River recession from flood and high stages, and as a result of significant precipitation events, bank area groundwater discharges result in internal erosion, piping of hydraulic fill (layered and lensed river alluvium of which the banks were constructed) which causes slope failures and displacement of overlying derrick stone. The failed hydraulic fill, including both piped out silts and sands and collapsed gravel and cobble lenses and derrick stone accumulate along the toe of slope at the Kanawha River Normal Pool and Water contact (566 msl). Subsequent high water and flood events re-work and erode failed hydraulic fill materials. Derrick stone accumulations, which include large stone 36" by 48", remain as a toe of upper bank armoring feature. Successive flood flow erosion result in exposure and failure of the hydraulic fill and formation of additional upper slope scarp features. These unstable erosion and failure bank reaches are then subject to additional high water stages and recessional failures since these saturated hydraulic fills continue to drain slowly as the Kanawha recedes from river crests to near normal pool stages. As a result of these interrelated bank erosion and failure processes the previously constructed stone stairways and storm water outfall flumes have become locations of most severe bank instability.

At the inception of this project, design engineers reviewed the recently constructed Patrick Street to Magic Island Section 14 Project. Stair reconstruction within the Patrick Street to Magic Island Section 14 project caused the blinding of the underlying hydraulic fill. Additional excavation and extensive placement of geosynthetic filter and granular bedding and filter material, and graded stone slope protection was constructed in what was believed would address stone stair structure foundation instability and the probability of these structures being otherwise outflanked. These components have not been effective since the constructed stairs precluded localized discharge of groundwater. This condition resulted in increased exit gradients and exit velocities at the edges of the stairs and within adjacent slope areas which resulted in loss of foundation, filter, and bedding materials. Furthermore, vandalism has resulted in the removal of stone slope protection for unauthorized uses. This vandalism has exposed additional bedding and filter material and resulted in stair misalignment and void formation and has increased the probability of failures.



Exposed and Lost Bedding Material on Downstream Side of Stairs as a Result of Vandalism at Patrick Street to Magic Island Section 14 Project



Exposed and Lost Bedding Material on Downstream Side of Stairs as a Result of Vandalism at Patrick Street to Magic Island Section 14 Project



Void Formation as a Result of Loss of Filter Material and Piped Foundation Soils Adjacent to Stone Stairs at Patrick Street to Magic Island Section 14 Project



Loss of Bedding and Filter Material Adjacent to Stairs at Patrick Street to Magic Island Section 14 Project Which will Result in Subsidence and Loss of Hydraulic Fill Foundation



**Void Formation Behind Maintenance Grout Filling of Void at Patrick Street to Magic Island
Section 14 Project**

Therefore the District should not modify established design requirements or construction practices to replace any of the eroded and failed stone stairs since construction of these features would result in a defect in the bank treatment. Stair placement would result in increased project failure risk and uncertainty. More frequent project monitoring, evaluations, and costly repairs to the stairs and adjacent related areas of stone slope protection failures would be necessary to prevent outflanking of the stone slope protection at the stairs.

Respectfully submitted by,

Alexander B. Neal, P.E.

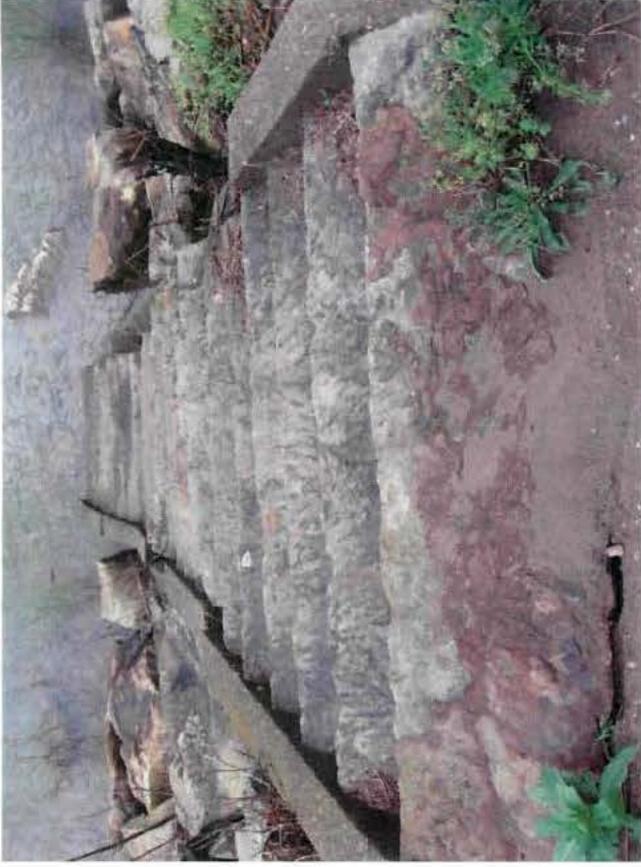
Lead Engineer

Kanawha Boulevard Section 14 Project

ATTACHMENT

Photographs





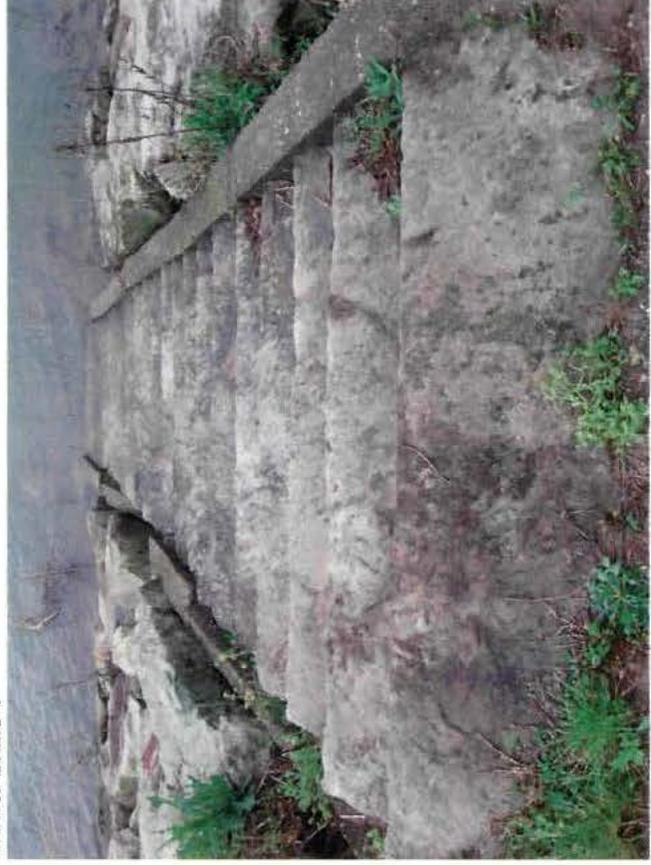
Lower Stairs 2



Lower Stairs 4



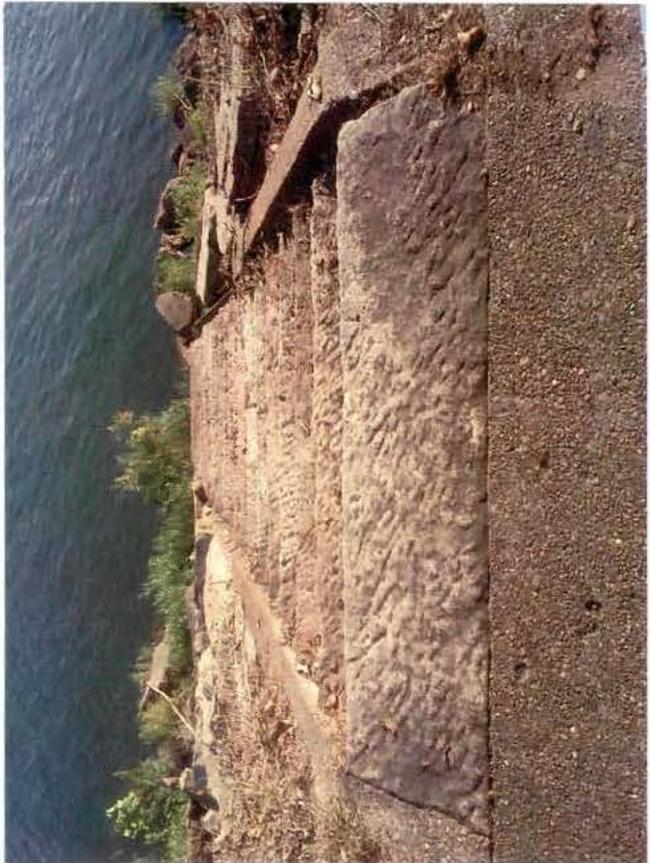
Lower Stairs 1



Lower Stairs 3



Lower Stairs 6



Lower Stairs 8



Lower Stairs 5



Lower Stairs 7



Lower Stairs 9



Rebuilt Stairs at Magic Island (South End of Project)



Rebuilt Stairs at Magic Island (North End of Project)



REPLY TO
ATTENTION OF

Department of the Army

HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

August 31, 2012

Planning, Programs and Project Management Division
Planning Branch, Environmental Analysis Section

Henry Battle, President
Kanawha Valley Historical & Preservation Society, Inc.
P.O. Box 2283
Charleston, WV 25328

RE: USACE Determination of Adverse Effect to Historic Properties from the Kanawha River 35th Street Bridge to Greenbrier Street CAP Section 14 Emergency Stream Bank Protection Project, Charleston, West Virginia (FR# 12-958-KA)

Dear Mr. Battle:

The US Army Corps of Engineers, Huntington District (District) is providing you with a copy of a response letter to the West Virginia Historic Preservation Office regarding the Kanawha River 35th Street Bridge to Greenbrier Street CAP Section 14 Emergency Stream Bank Protection Project. The District is also issuing a Draft Environmental Assessment (DEA) of the proposed undertaking in the near future.

The final alternative will be selected from the five (5) build and no build alternative after the thirty (30) day public review of the DEA. Final selection will take into account comments received from the public review as well as comments received from prior correspondence concerning the adverse effect to the Kanawha Boulevard.

Please submit any additional comments to my attention within 30 days of receipt of this letter. The District also welcomes comments to the DEA. If questions arise when reviewing the enclosed letter, please do not hesitate to contact Susan Stafford of my staff at (304) 399-5729 or by email at Susan.B.Stafford@usace.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "Jay Aya-ay".

Jay Aya-ay
Chief, Environmental Analysis Section

Enclosure



October 2, 2012

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300

Randall Reid-Smith, Commissioner

Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562

EEO/AA Employer

Mr. Jay Aya-ay
Chief
Dept. of the Army
Huntington District, COE
502 Eighth Street
Huntington, WV 25701

RE: Bank Stabilization Project – Kanawha River from 35th Street to Greenbrier Street
FR#: 12-958-KA-2

Dear Mr. Aya-ay:

We have reviewed the information submitted for above referenced project to determine its effects to cultural resources. As required by Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties," we submit our comments.

Architectural Resources

Thank you for forwarding the additional, requested information. Submitted information indicates that the project will now result in the demolition of Public Works Administration (PWA) stairs for one mile between 35th Street Bridge to Greenbrier Street; however, a conversation between Shirley Stewart Burns of my staff and Susan Stafford of your staff verified that the Capitol Steps will remain.

According to an engineering analysis submitted with the current submission, the original stairs were built upon excessive slopes that prohibit water from discharging underneath the stairs. Essentially, throughout the years, this force has dislodged the larger stones, which creates more areas for water to infiltrate and pop additional stones from an already unstable slope. According to the engineers, retaining the stairs is not feasible as doing so would result in further severe bank stabilization.

In addition, you have acknowledged that our earlier consultation regarding the Patrick Street to Magic Island portion of the bank stabilization project was never completed, and successful resolution of disagreements between our agencies regarding effects of the project to eligible resources did not occur. That project has already been completed, and any comments that we would offer at this point would be moot. In the future, we request that resolutions of disagreements between our offices be attempted before moving forward with a project.

October 2, 2012
Mr. Aya-ay
FR#: 12-958-KA-2
Page 2

It is your continued opinion that the proposed project will result in an adverse effect to eligible resources. We concur with this assessment. You have suggested some ideas for mitigation including using some of the steps for benches along the lower bank pathway and installing an informational sign regarding the PWA, and its part in erecting the stairs. Before moving forward with a Memorandum of Agreement (MOA) and deciding on final mitigation measures, we request that the public be allowed the opportunity to provide feedback regarding the types of mitigation that they would like to see. Once this information has been compiled, please forward those responses, along with a draft MOA, to our office.

Public Comments

It is our understanding that you have forwarded the same packet of information that our office received to a variety of organizations, including the Charleston HLC and the Kanawha Valley Historical & Preservation Society, Inc. Further, it is our understanding that as of the date of this letter, you have received no response from any organization or member of the public.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the Section 106 process, please contact or Shirley Stewart Burns, Structural Historian, in the Historic Preservation Office at (304) 558-0240.*

Sincerely,



Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/SSB

cc: Henry Battle, the Kanawha Valley Historical & Preservation Society, Inc.
Geoffrey Plagemann, Charleston HLC

APPENDIX D

MAILING LIST

Mailing List

Section 14 Emergency Streambank Protection Project Kanawha River 35th Street to Greenbrier Street, City of Charleston, WV

David Molgaard
City Manager
501 Virginia Street East, Room 101
Charleston, WV 25301

Susan Pierce
State Historic Preservation Office
1900 Kanawha Boulevard, E.
Charleston, West Virginia 25305-0300

Chris Knox
City Engineer
105 Main Street
Charleston, WV 25301

Paul A. Mattox, Jr., P.E.
West Virginia Department of Transportation
Building 5
1900 Kanawha Blvd E
Charleston, WV 25305

Gerry Workman, Chairman
Municipal Planning Commission
515 Havana Drive
Charleston, WV 25311

Janet Clayton
WV Department of Natural Resources
P.O. Box 67
Elkins, WV 26241

Lori Brannon c/o Planning & Zoning Dept.
Charleston Historic Landmarks Commission
915 Quarrier Street
Charleston, WV 25301

Lyle Bennett
WV DEP
601 57th Street
Charleston, WV 25304

Mary Jane Vanderwilt
Municipal Beautification Commission
1208 Upper Ridgeway Road
Charleston, WV 25322

John Forren NEPA/404 Coordinator
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, Pennsylvania 19103

Geoffrey Plagemann
Staff Liaison to the Charleston Historic Landmarks
Commission
City of Charleston Planning Department
915 Quarrier Street, Suite 1
Charleston, WV 25301

Deborah Carter, Field Supervisor
U.S Fish and Wildlife Service
694 Beverly Pike
Elkins, West Virginia 26241

Ric Cavendar, Executive Director
East End Main Street
1116 Smith Street
Charleston, WV 25301-1314

Kanawha County Public Library
123 Capitol St.
Charleston, WV 25301

Henry Battle, President
Kanawha Valley Historical & Preservation Society, Inc.
P.O. Box 2283
Charleston, WV 25328

Honorable Earl Ray Tomblin
Governor of West Virginia
1900 Kanawha Boulevard, E
Charleston, WV 25305

Honorable Jay Rockefeller
United States Senate
405 Capitol Street
Suite 508
Charleston, WV 25301

Honorable Joe Manchin
United States Senate
300 Virginia Street, East
Suite 2630
Charleston, WV 25301

Honorable Shelley Moore Capito
House of Representatives
4815 MacCorkle Ave., SE
Charleston, WV 25304

Honorable Dan Foster
West Virginia State Senate
Room 223W, Building 1
State Capitol Complex
Charleston, WV 25305

US Post Office
1002 Lee Street East
Charleston, WV 25301

US Post Office
4600 MacCorkle Ave SE
Charleston, WV 25304

Honorable Brooks McCabe
West Virginia State Senate
Room 441M, Building 1
State Capitol Complex
Charleston, WV 25305

Honorable Corey Palumbo
West Virginia State Senate
Room 210W, Building 1
State Capitol Complex
Charleston, WV 25305

Honorable Erik Wells
West Virginia State Senate
Room 417M, Building 1
State Capitol Complex
Charleston, WV 25305

Honorable Meshea Poore
West Virginia House of Delegates
Room 208E, Building 1
State Capitol Complex
Charleston, WV 25305

Honorable Danny Jones
Mayor of Charleston
501 Virginia Street East
Charleston, WV 25301

US Post Office
1579 Washington Street East
Charleston, WV 25311

APPENDIX E

NOTICE OF AVAILABILITY

**NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT
SECTION 14 EMERGENCY STREAMBANK PROTECTION PROJECT
KANAWHA RIVER 35TH STREET TO GREENBRIER STREET
CITY OF CHARLESTON, WV**

The U.S. Army Corps of Engineers, Huntington District, by this Notice of Availability, advises the public that the combined Draft Planning Design Analysis (PDA) and Environmental Assessment (EA) is complete and available for public review for the proposed streambank protection project located along the Kanawha River in Charleston, WV. The purpose of the project is to stabilize 5,325 linear feet of failing riverbank in order to protect Kanawha Boulevard. The recommended alternative includes the placement of a stone blanket on the existing derrick stone on the lower bank slope. The treatment would extend from just below normal pool level to approximately 25 feet up the bank to a paved recreational pathway. The treatment length would extend from Greenbrier Street and would stop shortly before the 35th Street Bridge abutment. A Finding of No Significant Impact (FONSI) is anticipated for the proposed project. A copy of the draft FONSI is included with the Draft PDA/EA for public review.

In compliance with the National Environmental Policy Act (NEPA) and 40 CFR 1501.4, the Draft PDA/EA and draft FONSI will be available to the public in the affected area for thirty (30) days for review and comment. Final determination regarding the need for additional NEPA documentation will be made after the public review period, which begins on or about November 16, 2012. Copies of the documents may be viewed at the following location:

Kanawha County Public Library
123 Capitol Street
Charleston WV 25301

The documents may also be viewed at the following website:
<http://www.lrh.usace.army.mil/Missions/PublicReview.aspx>

Copies of the Draft PDA/EA and Draft FONSI may be obtained by contacting the Huntington District Office of the Corps of Engineers at (304) 399-5276. Comments pertaining to the documents may be submitted on the website named above, by e-mail to: LRHPublicComments@usace.army.mil; or by letter to:

Mr. Jonathan J. Aya-ay, Chief
Environmental Analysis Section, Planning Branch
Huntington District Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701-2070

APPENDIX F

BASELINE COST ESTIMATE

NOT AVAILABLE FOR PUBLIC REVIEW