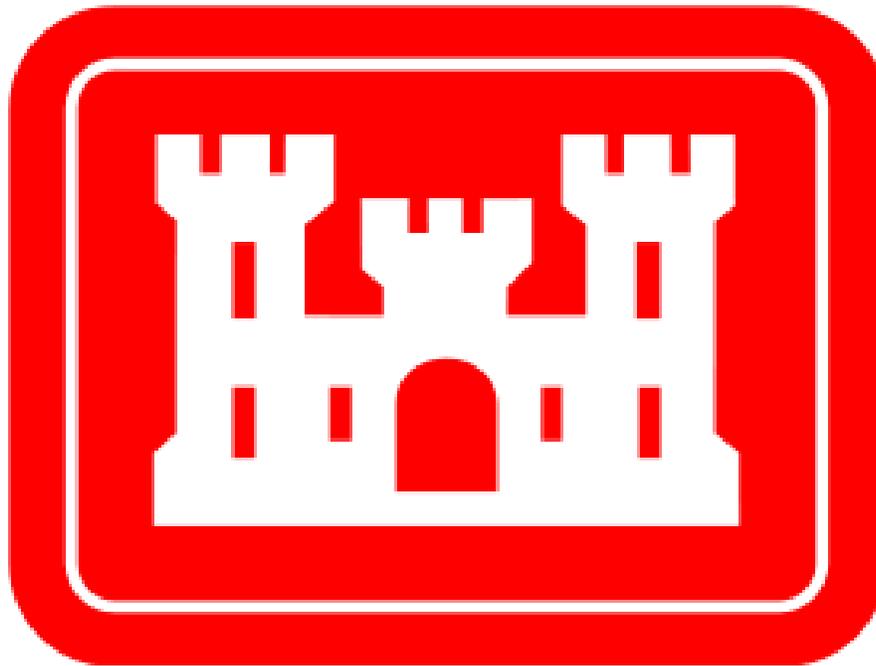




DRAFT ENVIRONMENTAL ASSESSMENT AND
PLANNING DESIGN ANALYSIS
SECTION 14 EMERGENCY STREAMBANK PROTECTION PROJECT
CITY OF MARIETTA, WASHINGTON COUNTY, OHIO



U.S. Army Corps of Engineers
Huntington District
Huntington, West Virginia

March 2012



ABSTRACT

In accordance with the National Environmental Policy Act (NEPA), the U.S. Army Corps of Engineers (USACE) Huntington District has prepared this Environmental Assessment (EA) and Planning Design Analysis (PDA) to evaluate the potential environmental impacts of a streambank protection project in Washington County, Ohio. Studies for this project were initiated under Section 14 of the Flood Control Act of 1946 (PL 79-526) as amended; Emergency Streambank Protection. This law provides authority for the USACE to implement streambank erosion protection projects to protect public facilities, including public works that are open to all people on equal terms. The Huntington District's review and analysis of economic, human and natural environments, and engineering designs has determined that the Preferred Alternative is the most environmentally sound alternative that best meets the Proposed Action's purpose and need.

The Preferred Alternative for the City of Marietta Emergency Streambank Protection Project includes design and construction of a longitudinal dike to protect a sewer collection line which is endangered due to flood related erosion and recessional bank failures. Failure of the line would result in a serious health issue for downstream communities taking municipal drinking water from the Ohio River and significant impacts for sensitive aquatic species. This sewer collection line, a key component of the public works sewage collection and treatment system serves a population of 14,500 people and numerous businesses and industries within the City of Marietta. The purpose of this project is to provide a cost-effective means to prevent further damage to the municipal sewer line.

Information gathered for the preparation of the EA was derived from Federal and State agencies. Areas of concern including aquatic and terrestrial ecosystems, wetlands, socioeconomic, Hazardous, Toxic, and Radioactive Waste (HTRW), were evaluated for potential adverse impacts. Impacts associated with the Project Area are anticipated to be minimal. During project construction, there would likely be minor and localized and temporary increase in turbidity to waters in the Ohio River. However, all resources would realize long-term benefits from project implementation.

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DRAFT FINDING OF NO SIGNIFICANT IMPACT
SECTION 14 EMERGENCY STREAMBANK PROTECTION
CITY OF MARIETTA PROJECT
WASHINGTON COUNTY, OHIO

1. Members of my staff have conducted an environmental assessment, in the overall public interest, which considers the environmental impacts of the proposed City of Marietta Emergency Streambank Protection Project in Washington County, Ohio. The purpose of this project is to provide a cost-effective means to prevent further damage to the municipal sewer line. The Preferred Alternative includes design and construction of a longitudinal dike. The proposed project is authorized under Section 14 of the Flood Control Act of 1946 (PL 79-526) as amended.

2. The possible consequences of the project have been studied for environmental, cultural and social well-being effects.

3. The Preferred Alternative and the No Action Alternative were the only alternatives carried forward for detailed evaluation. The Preferred Alternative is the most cost effective and is both environmentally and socially acceptable. The No Action Alternative would not be in the public's best interest and would have continued negative impact on the natural resources of the area.

4. An evaluation of the Preferred Alternative and the No Action Alternative produced the following pertinent conclusions:

a. Environmental Considerations. The Huntington District has taken reasonable measures to assemble and present the known or foreseeable impacts of the Preferred Alternative to the human and natural environment in the Environmental Assessment (EA). All potential adverse impacts of the proposed action are insignificant.

b. Social Well-Being Considerations. No significant economic or social well-being impacts that are both adverse and/or unavoidable are foreseen as a result of the Preferred Alternative. The human community would benefit from the proposed action. The proposed action will ensure that residents of Marietta continue to receive sewage collection service and it safeguards the drinking water of downstream communities. The Preferred Alternative will not have any impact on sites of significant archeological or historical importance. The Phase 1 Hazardous, Toxic, and Radioactive Waste (HTRW) assessment documented in the EA recommends certain procedures during construction to avoid impacts. Following these recommendations will allow HTRW to not be impacted on the site.

c. Coordination with Resource Agencies. Coordination with the following agencies has been performed: the U.S. Fish and Wildlife Service, West Virginia Division of Natural Resources, the U.S. Department of Agriculture, and the Ohio Division of Natural Resources. The U.S. Army Corps of Engineers will coordinate with the Ohio Historic Preservation Office under Section 106 of the National Historic Preservation Act (NHPA) to address any concerns or recommendations during the 30-day public review period. Pursuant to the Fish and Wildlife Coordination Act (FWCA) of 1958 as

amended, and the Endangered Species Act of 1970 as amended, the Preferred Alternative should not impact listed species. Appropriate measures and best management practices have been identified and incorporated into the plan.

d. Other Pertinent Compliance. The Preferred Alternative is also in compliance with Section 401 of the Clean Water Act, Executive Order (EO) 11988 (Floodplain Management), and EO 11990 (Protection of Wetlands). The PAA is not expected to have significant impact on prime or unique farmland under the Farmland Protection Policy Act (FPPA). National Pollutant Discharge Elimination System (NPDES) permit may be required for construction storm water.

e. Other Public Interest Considerations. There has been no opposition to the proposed action expressed by the state or local governments, or organized environmental groups, and there are no unresolved issues regarding the implementation of the Preferred Alternative. Comments received during the public review period are included in the EA.

f. Section 176(c) Clean Air Act. The Preferred Alternative has been analyzed for conformity and applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act (CAA). The Preferred Alternative will not exceed *de minimis* levels or direct emissions of a criteria pollutant or its precursors and is exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the District's continuing program responsibility and generally cannot be practicably controlled by the District. For these reasons a conformity determination is not required for the action.

5. I find the City of Marietta Emergency Streambank Protection Project has been planned in accordance with current authorization as described in the EA. The Preferred Alternative is consistent with national policy, statues and administrative directives. This determination is based on thorough analysis and evaluation of the Preferred Alternative and the alternative courses of action. In conclusion, I find the proposed City of Marietta Emergency Streambank Protection Project will have no significant impact or adverse effect on the quality of the human environment.

Date

Robert D. Peterson
Colonel, Corps of Engineers
District Engineer

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SECTION I. SUMMARY

This Draft Environmental Assessment and Planning Design Analysis is being prepared to identify the most cost-effective alternative while minimizing environmental, economic, and social impacts that may result from the proposed streambank protection project located on the Ohio River near Marietta, Ohio. Erosion and bank failures from flood events have endangered a municipal main sewer line paralleling the Ohio River. The proposed project consists of protecting the sewer line from further encroachment by the river during flood events and eventual failure.

SECTION II. PURPOSE AND NEED

The purpose of this project is to provide a cost-effective means to prevent further damage to the municipal sewer line. The proposed project is in accordance with guidelines established for Section 14 of the Flood Control Act of 1946 (PL 79-526) as amended; Emergency Streambank Protection. The Section 14 program is designed to implement streambank erosion protection projects to public facilities, including public works that are open to all people on equal terms.

During recent Ohio River flood events occurring in a period between 2001 to present, a 1050 foot reach of 36-inch diameter sewer line was misaligned due to flood related erosion and rapid recession bank failures. Bank erosion and failures have resulted in endangerment of the sewer line. Flood related bank erosion and failures could continue, resulting in a breach of the sewer line



Figure 1 *Flood Erosion along the Ohio River has lead to bank failure endangering the adjacent sewer line.*

SECTION III. DESCRIPTION OF ALTERNATIVES

1. Alternatives considered

Longitudinal Dike (see cross section in Appendix A).

A 1050-foot reach of longitudinal dike would be constructed to protect the sewage line from further exposure, endangerment, and failure. Requirements for the construction of this plan require limited clearing and grubbing of vegetation, partial removal of trees, drift, rubble, and debris within the dike footprint and transitions. The dike would be built on the edge of the shallow water bench above normal pool elevation, but below the ordinary high water line (OHWL). The proposed treatment would consist of placing COE 15 inch rock to stable geometries within the lower bank bench, extending from normal pool/land water contact, to form a slope of 1.5H:1V on the riverward face of dike. The dike would be six feet high and have a three-foot top width (Figure 2). The dike crest height would be reduced in an approximate 20 foot section to maintain river access for the county maintenance yard. Rock placement would form a 1.3H:1V back slope. The interior dike area would then fill with failed soils and sediment after storms and high water events. The accumulated sediment would provide additional soil for riparian vegetation to volunteer and establish. Up and downriver transitions and woody adventitious vegetation (deposited from high water events) will be necessary to prevent flood flows from eroding recently retained sediments and failed bank soils and to address the potential for outflanking. Across from the site, a system of dikes constructed adjacent to Buckley Island illustrates the effectiveness of similar vegetative components (Figure 3). Construction would be accomplished by the Indefinite Delivery Indefinite Quantity Contract (IDIQ) using land based construction methods. The contractor will access the site from Pierce Street and through the county maintenance and stockpile yard existing river access ramp. The contractor will construct a haul road on the access ramp to the river by placing stone on filter reinforcement fabric to the base of the dike structure. The base of dike will serve as the haul road and will be constructed on reinforcement/filter fabric to the full length of the dike. Trimming of vegetation and some debris clearing will be required to allow access of equipment along dike alignment. Hauling and initial placement of stone will be from dump trucks provided by the quarry. Stone will be shaped to final configuration using a bulldozer and excavator. Post construction volunteering of native adventitious vegetation will be a necessary component of the treatment. The total project cost would be \$375,000. This is considered the Preferred Alternative.

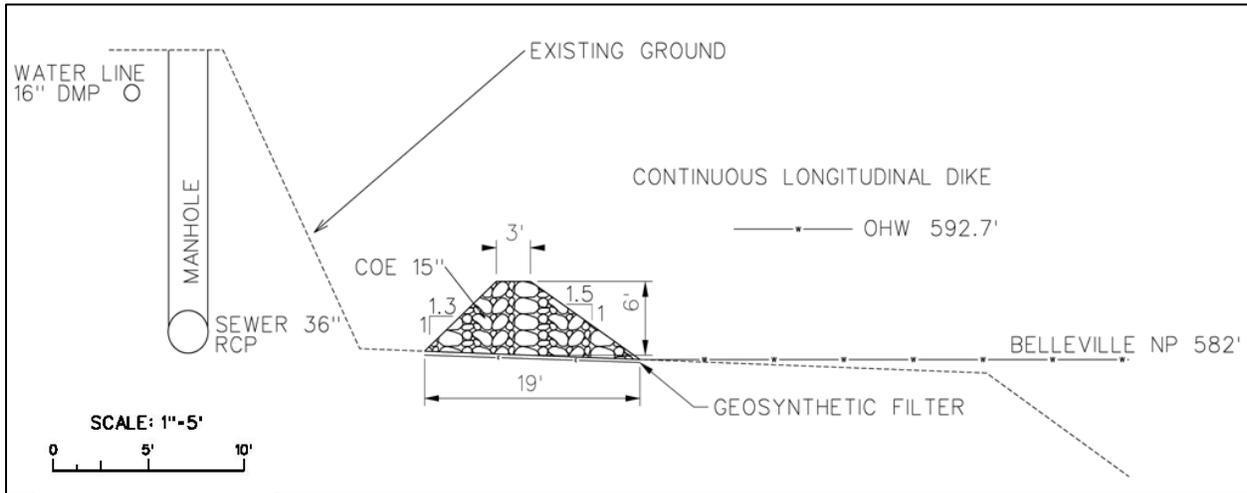


Figure 2 Typical Cross Section of longitudinal dike protection of sewer line. Area behind the dike will naturally fill with Ohio River sediment.



Figure 3 Dike built in 2006 at Buckley Island on the Ohio River. Previously eroded bankline has filled with sediment and new vegetation has volunteered in.

No Action.

Under the No Action Alternative there would be no bank protection. Failure to protect this sewer line would result in further endangerment and breach of the line resulting in a serious health issue for downstream communities taking municipal drinking water from the Ohio River and in significant impacts for sensitive aquatic species in the Ohio River. Breach of this line would result in loss of service to approximately 14,500 customers. These customers include private, public, commercial, and industrial facilities within the City of Marietta.

2. **Alternatives Dismissed from Further Consideration.**

Alternatives considered but dismissed from further consideration include Sheet Piling, Gabion or Crib Wall Treatment, Vegetative Cover, and Relocation. A brief description of each alternative is provided below.

Sheet Piling

Installation of this alternative would require the excavation of failed soil, fill, debris, and vegetation to expose a suitable installation surface. Stone would be placed to construct erosion protection at the up and downriver limits of treatment. Cost for construction of this treatment would be \$2,350,000. This alternative provides protection for the sewer line similar to the longitudinal dike option but with greater adverse environmental impacts. As this alternative was significantly less cost-effective, it was eliminated from further consideration.

Gabion Basket/Crib Wall Treatment

This method of streambank stabilization requires bank preparation similar to that required for conventional stone slope treatments which includes excavation of failed soil, fill, debris, and vegetation and placement of free-draining granular fill and geotextile filter, and basket/crib or block treatment placed to stable slopes for height of bank. This treatment would use a pre-manufactured wire basket or interlocking concrete crib anchored within in-place soils. Stone transitions would be placed. Gabion wall would be constructed along the full length of failed bank. The engineered near vertical surface of these materials are not as conducive for the establishment of vegetation thereby resulting in reduced environmental and aesthetic quality when compared to the longitudinal dike alternative. The cost for this alternative is approximately \$780,000. This alternative provides protection for the sewer line similar to the longitudinal dike option but at higher cost. Therefore, the Gabion Basket/Crib Wall treatments are eliminated from further consideration.

Vegetative Cover

Vegetative treatments cannot be implemented at this site due to continuing failures and erosion occurring along the adjacent river bank. Excavating to stable slope geometries to allow for installation of vegetation would require the relocation of the sewer line and would not affect sufficient sewer and manhole stability or be cost justifiable. This alternative would not provide

sewer line protection, the fundamental project objective, and was eliminated from further consideration.

Relocation

The relocation of the sewer line would cost approximately \$1,200,000. Relocation would include acquisition of real estate and relocation of utilities. Such relocation would also require significant removal of riparian vegetation along the sewer line causing greater environmental damage than the longitudinal dike alternative. This alternative provides protection for the sewer line similar to the longitudinal dike option but is less cost-effective and was therefore not further considered.

SECTION IV. GEOGRAPHICAL ASPECTS

1. Location.

This project is located on the right descending bank of the Ohio River within the City of Marietta, Ohio (Figure 4). The project is located at Ohio River Mile 171 at 39.407452° latitude, -81.432116° longitude (WGS84) and is located above Belleville Lock and Dam normal pool elevation of 582 feet above mean sea level (ft-msl). The OHWL at the project location is about 592.7 ft-msl (Ohio River Navigation Chart 2009).

2. Physical Features.

The proposed project area is located in the Unglaciated Allegheny Plateau Section of the Appalachian Plateau Physiographic Province. The area is characterized by steep hills and valleys and maturely dissected topography of moderately high to high relief (ODNR). Adjacent riverbanks are actively eroding and failing.

3. Climate.

Using the Köppen climate classification system, the proposed project area is located in the humid continental climate region. Precipitation is relatively distributed and moderate year round. This location experiences large seasonal temperature differences due to the continentality of the project location (Rohli et al., 2008)

Draft Environmental Assessment and Planning Design Analysis
Section 14 Emergency Streambank Protection Project, Marietta, Ohio

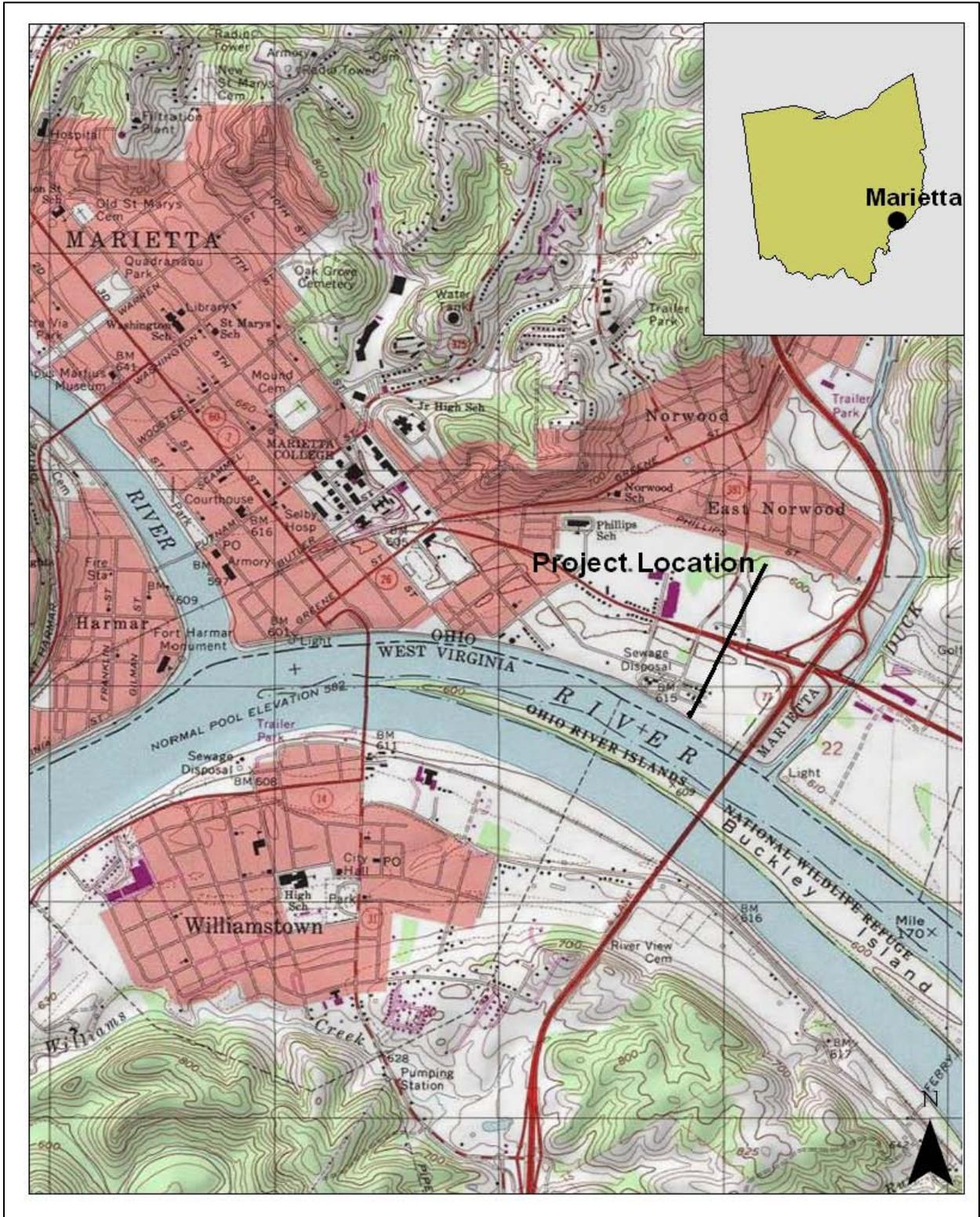


Figure 4 The area depicted above is shown in more detail in the Construction Work Limit (CWL) map located in Appendix A.

SECTION V. EXISTING CONDITIONS AND IMPACTS OF ALTERNATIVES

1. Cultural Resources

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

In general, the Preferred Alternative will result in no new ground disturbance, although stone placement and tree trimming would cause minor surface disturbance. No cultural resources eligible for inclusion in the National Register of Historic Places are located within the project work limits. A search of files maintained by the Ohio Historic Preservation Office online revealed no recorded resources and an examination of the project work limits by the District Archeologist revealed a heavily over-steepened bank covered with secondary deposits of rubble and refuse debris. No evidence of eroding archeological material or other historic properties were identified. However, if left untreated, further erosion could lead to the exposure of archeological deposits. If enacted, the Preferred Alternative would stabilize the bank to prevent potential loss of buried resources due to natural erosion.

The Preferred Alternative has no potential to affect any above-ground historic property located outside of the project work limits. Permanent changes to the landscape will be limited to portions of the riverbank exposed above the Ohio River. The river bank and modern commercial facilities located directly on the bank will shelter Ohio from views of the project. Undeveloped Buckley Island will shelter the built environment in West Virginia from views of the project.

Therefore, in accordance with 36 CFR 800.4(d)(1), the District has determined that no historic properties will be affected by the Preferred Alternative. If project work limits are expanded or if unanticipated cultural resources are discovered during construction activities, all activities in the immediate area would cease and the District would resolve its obligations under U.S.C. 470(f) utilizing the procedures set forth in 36 CFR 800.13, for post-review discoveries.

Although no cultural resource are known to be in the area, under the No Action alternative, further erosion could potentially uncover and disturb unknown subterranean archeological resources that could be eligible for inclusion in the National Register of Historic Places. If exposed, these deposits could be looted and/or otherwise damaged by flooding, scouring and retreating of the Ohio River. The resulting damage could result in an adverse effect to historic properties.

2. Aesthetic Resources.

The project area contains low quality and quantity riparian vegetation near the bankline. In general, the bankline is covered with flood event deposited sands and silt along the river's edge. The project area is surrounded by vegetated banks with lesser erosion continuing along the bankline. The aesthetic quality of the project is further diminished by the presence of rubble and debris (Figure 5). Some of the project area is visible from the adjacent top of bank and from a maintenance and stockpile yard owned by the county. There is an unpaved road leading to the project area. The opposite bank is Buckley Island, part of the Ohio River Islands National Wildlife Refuge (NWR). Recreational boating is common in the Ohio River. This site would be primarily visible to recreational boaters and barge industry workers.

Under the Preferred Alternative, the current vegetation would remain largely intact. The appearance of the longitudinal stone dike would introduce an unnatural-appearing structure. Although the stone will initially contrast in color with the natural surroundings, it will darken and become covered with vegetation over time, significantly lowering its long-term visual impact. From the adjacent bank, visitors of Buckley Island would initially be able to clearly see the stone dike. Over time, vegetation behind and within the dike would obscure the stone and also limit some of the visibility to the river. Under the No Action alternative, viewers would have little, if any, change in aesthetics until erosion actually compromises the sewer main.

Both the No Action and Preferred Alternatives introduce visual changes to the project area bankline. Compared to the No Action alternative, the Preferred Alternative would preserve and enhance more natural native woody vegetation at the site, and would therefore have no significant adverse impact on aesthetic resources.



Figure 5 *Debris scattered along the project area.*

3. **Recreation Resources.**

The Ohio River is used for recreational boating, water-skiing, jet skis, and fishing. There is an unpaved sand and gravel road leading to the bankline. However, this property is on county land and inaccessible to the public. Some of the banks are wide and sandy and thus easily accessible to fishermen. During a site visit to the project area, a fire pit and make shift bench was visible in the sand near the bankline, indicating that the bankline area experiences use by local residents. The remaining project bankline is narrow and covered with debris from the river and is largely inaccessible to casual recreational users by foot.

Under the Preferred Alternative, recreational fishing and boating would not likely be directly affected by this project, as the entire stone dike placement would be above normal pool water elevation. The Preferred Alternative therefore has no anticipated long-term significant impacts to recreation. Recreational impacts would be minor and short-term. Construction equipment and noise at the site may pose a minor nuisance to some recreational boaters. The effects would be brief and would not directly impose upon existing recreational uses. The Preferred Alternative would therefore have no significant effect on recreational resources.

The No Action alternative would have no direct effect on recreation in the near term. However, in the event of sewer line failure, aquatic species would be impacted with potential adverse impacts to recreation.

4. **Economic Resources.**

While the Preferred Alternative would likely allow continued sanitary service to residents and industry in the city, the No Action alternative would result in decreased net economic benefit associated with service interruption, maintenance, and replacement costs for the existing sewer line. Relocation of the sewer line would be expensive and is a higher cost than the Preferred Alternative, while delivering essentially the same services to the city. The Preferred Alternative should preclude the probability of sewer failure and therefore decrease costs of loss of function and maintenance.

5. **Environmental Resources.**

a. **General.**

Environmental resources at the site are very limited due to extensive flood related bank erosion. Project implementation would have inconsequential overall adverse impacts on environmental resources. The No Action alternative would result in continued erosion and eventual failure of the sewer line.

b. **Aquatic Resources.**

The project area contains a low quantity of riparian habitat with severely eroding banks along a shallow aquatic bench. Barge tows carrying coal, industrial projects, and chemicals navigate throughout the river channel. The Ohio River supports an aquatic community of species that include invertebrates, mussels, fish, amphibians, and reptiles, which live in spite of these human disturbances. Riparian habitats, the strips of inundation-tolerant vegetation along rivers, are important for the aquatic health of a river system. Riparian habitat captures and filters silt and pollution during flooding and provides an influx of plant and insect matter that serves as food for the aquatic ecosystem. Dense riparian vegetation is becoming increasingly rare. Because the project area is prone to erosion and bank failure, the riparian vegetation is stressed and silt and sediment are transported away from the river bank, rather than being retained as would occur in a healthy riparian environment. Silt can harm sensitive mussel species, which are filter feeders and live in the benthic substrate. Fish, which breed, feed, and find shelter near riparian habitat, are also impacted by excess sedimentation. The Preferred Alternative would result in sediment deposition between the landward side of the dike and the existing riverbank, supplying nutrient-rich soil for riparian plant species and reducing excess silt and sediment release from the existing riverbank into the aquatic ecosystem, thus protecting aquatic species such as fish and mussels. There would be minor temporary impacts in the form of sedimentation due to construction activities however best management practices (silt fencing) would be utilized as necessary to minimize effects. The project would be constructed completely out of the Ohio River normal pool and by land based construction thus eliminating any long-term aquatic impacts associated

with construction. The Preferred Alternative would therefore have a net positive long-term impact to the aquatic ecosystem. Under the No Action alternative, aquatic degradation caused by bank erosion would continue and should sewer breach occur, discharge of raw sewage would significantly impact aquatic species.

c. Terrestrial Resources.

Terrestrial resources within the project area are limited due to the severe streambank erosion throughout the project reach. The project area lacks diversity of riparian hardwoods along the riverbank. Small sapling shrubs dominate the project area. Dominant tree species in this area include box elder and sycamore. The riparian habitat is further compromised by invasive vegetation. Japanese knotweed and tree-of-heaven are an invasive species located in the project area, limiting indigenous herbaceous species from becoming established. Near the normal pool water contact of the Ohio River, a combination of erosion, recessional failures, and piping associated with periodic flood and recessional events have eroded soil away from the riverbank. Wave action along the bench formed at the water's edge effects a constant rework and transport of failed soils and alluvial substrate preventing permanent vegetation from establishing that would otherwise function to slow down the erosion process. Due to the lack of natural rehabilitation mechanism under the No Action alternative, the riparian habitat is expected to become increasingly degraded over time. The Preferred Alternative, in addition to protecting the underlying sewer line, would also protect the riparian vegetation at risk. The Preferred Alternative will allow for indigenous plant species to reestablish. Once the interior dike area fills with failed soils and sediments deposited after storms and high water events, the accumulated sediment would then provide additional soil for riparian vegetation to volunteer in and establish. The Preferred Alternative would therefore benefit the local habitat and have no significant long-term impacts on terrestrial environmental resources. The proposed design concept has been applied to other sites along the Ohio River, resulting in bank stabilization, protection of existing trees, and recruitment of dense volunteer native woody vegetation that otherwise would not have been established.

d. Threatened and Endangered (T&E) Species.

There are 30 T&E species found within Ohio as listed by the US Fish and Wildlife Service (USFWS). Of these, five could potentially be found within and around the Bellville navigation pool of the Ohio River. These include the Indiana Bat (*Myotis sodalists*), the Eastern Hellbender (*Cryptobranchus a. alleganiensis*), the Bald Eagle (*Haliaeetus leucocephalus*), the following Fanshell Mussel (*Cyprogenia stegaria*), and the Pink Mucket Pearly Mussel (*Lampsilis abrupt*). The proposed project also lies within the range of two freshwater mussels, the Sheepsnose Mussel (*Plethabasus cyphus*) and the Snuffbox Mussel (*Epioblasma triquetra*) that are currently proposed for listing as federally endangered. The Ohio Department of Natural Resources (ODNR) Division of Wildlife (DOW) Ohio Biodiversity Database has located the following four rare fish within the vicinity of the project area on the Ohio River: Ohio lamprey (*Ichthyomyzon bdellium*), state endangered, Channel Darter (*Percina copelandi*), state threatened, River Darter (*Percina shumardi*), state threatened, and River Redhorse (*Moxostoma carinatum*), state species of concern.

During project scoping, the USFWS pursuant to Section 7 of the Threatened and Endangered species act concluded that due to project type, size and location of the project, as proposed, should have no effect on the Indiana Bat, Eastern Hellbender, and Bald Eagle (correspondence with USFWS, 2011). The letter identified potential impact to federally listed mussel species including the fanshell and pink mucket pearly mussel as well as sheepnose and snuffbox proposed for listing as federally endangered. As there are no known published information on the location of mussel beds in the project area, a survey was recommended to determine the presence or possible absence of these mussels in the vicinity of the project site.

A recon was conducted by the USFWS Ohio River Islands NWR personnel on August 22 to 24, 2011. A total of 427 individuals representing 17 species of mussels were collected alive, including the endangered fanshell, candidate sheepnose, and rare salamander mussel (See Appendix G for USFWS Habitat and Mussel Community Assessment). The Corp will avoid potential impacts to mussels by constructing the dike above the normal pool elevation, 582 ft-msl and by constructing the dike using only land based equipment. The Preferred Alternative is not likely to adversely affect listed mussel species.

Under the No Action alternative, long-term releases of silt and eroding bank material could impact or bury silt-intolerant mussel species although the watershed impacts would not be predictable.

e. Water Quality.

The entire length of the Ohio River is listed as impaired due to elevated polychlorinated biphenyls (PCB) levels, an industrial pollutant (EPA 2002). In general, industrial pollutants, municipal sewers, urban runoff, loss of riparian buffer, and water column impacts from navigational dams and towboats have resulted in long-term impacts on water quality in the Ohio River and its tributaries. Ohio River fish consumption advisories illustrate the degradation of water quality in and along the river. The Preferred Alternative would reduce local siltation caused by active erosion of the riverbank and protect important riparian vegetation in the project reach. Jurisdictional waters of the US extend to the OHWL, which is about 10.7 feet above the normal water line above which the proposed dike would be constructed. Temporary impacts of placing the proposed stone dike in the waters of the US would be minimized by following best management practices. Coordination with the Ohio Division of Environmental Protection Division of Surface Water on March 21, 2011, was conducted to discuss details of the current proposal and potential applicability for Nationwide permitting. Upon review, the Ohio EPA concluded that the current project meets certification for Nationwide Permit 12, Maintenance of utility lines. Correspondence with the Ohio EPA is attached in Appendix B. A National Pollutant Discharge Elimination System (NPDES) permit is required for construction storm water (correspondence with Washington Soil and Water Conservation District).

f. Hazardous, Toxic, or Radioactive Waste (HTRW).

A Phase 1 HTRW assessment was conducted within the proposed project area. This project is located along the Ohio River in a commercial area where the city wastewater treatment plant, the Washington County, OH tract containing road maintenance materials, and a junkyard are located. Sludge from the city's wastewater treatment plant (WWTP) is managed off-site at permitted facilities in accordance with appropriate environmental regulations; no land farming of sludge takes place within the project area. The city's outfall is downstream of the project area. No combined sewer overflows are located within the project area. An active, main storm drainage line draining about 12 acres from the Jefferson Street to Pike Street area is located within the project area. Coal slag/coal cinder ash was observed along the western portion of the project area and along the bank in the vicinity of the Washington County, OH property. The bank area of the Washington County, OH property is currently used for barge off-loading of transit aggregates (sand and gravel) for road maintenance. Previously, barges would off-load cinder ash from power plants to be used by the county for snow and ice control. Discarded tires and concrete were visible in several places along the bank. Below are the following HTRW recommendations:

- ***Avoid excavation or other movement*** of the coal slag and cinder ash located along the county property and along the downstream end of the project. Construction workers need to be made aware that the coal slag/ash may contain elevated levels of heavy metals.
- Miscellaneous debris such as concrete and bricks, along with other miscellaneous materials or waste, that are removed from the work zone need to be disposed at a permitted solid waste landfill in accordance with the appropriate solid waste regulations. Discarded tires that are removed from the work zone are considered a "special waste" and need to be recycled/disposed at a permitted solid waste facility in accordance with the appropriate Ohio EPA Solid Waste Regulations.
- Impacts to the stormwater outfall located within the eastern portion of the project area need to be avoided.
- During construction, if evidence of contamination is discovered in the area of the auto salvage facility, then construction shall be halted for consideration of impacts to the project.

No sampling of surface water or soil is recommended at this time. No further HTRW concerns were noted.

g. Air Quality.

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

- Carbon monoxide (CO)
- Lead (Pb)
- Nitrogen dioxide (NO₂)
- Ozone (O₃)
- 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) 1997 Standard
 - An aerodynamic size less than or equal to 2.5 micrometers (PM 2.5) 2006 Standard
- Sulfur dioxide

Washington County is in attainment of all criteria air pollutants except for particulate matter (PM 2.5) at the level of 15.0 microgram per cubic meter particulates, which are released primarily through industrial activities (Ohio EPA Division of Air Pollution Control). In general, construction activities described by the Preferred Alternative would have the potential to cause localized temporary, nuisance air quality impacts, including particulate emissions. Emission sources include diesel exhaust and fuel odors associated with operation of heavy equipment, engine emissions associated with construction and construction activities. A maintenance and stockpile yard owned by Washington County is located immediately adjacent to the project site and may realize a temporary increase of air emissions associated with the construction of the stone dike structure.

All construction would be performed in compliance with applicable Ohio EPA Division of Air Pollution Control requirements. The construction period is expected to be brief and impacts would not exceed de minimis levels of direct emissions of a criteria pollutant. Under the No Action alternative, further erosion of the riverbank and endangerment of the sewer line would eventually require repairs or relocation, leading to similar temporary elevations in emissions from construction equipment.

h. Wetlands.

The physiography and drainage patterns at the project are not conducive of the formation or occurrence of wetlands. A review of the National Wetlands Inventory (NWI) maps as well as an on-site survey revealed no wetlands in the project area.

i. Noise Level.

Ambient noise in the area is representative of a mixed commercial/industrial area. Immediately adjacent to the project area is a auto salvage yard and county maintenance and stockpile yard whose activities contribute significantly to ambient noise in the project area. Nearby receptors which lie landward of the auto salvage and stockpile yards include residences and a commercial shopping plaza.

There would be a temporary increase in noise levels associated with increased traffic and machinery use during project construction. Equipment to be used during project construction, including, but not limited to trucks, excavators, bulldozers and end loaders would contribute to ambient noise in the area. However, construction would be limited to daytime hours and would likely be unnoticeable to receptors in the project vicinity due to ambient noise from the neighboring auto salvage facility and county maintenance and stockpile yard. Therefore, impacts for the Preferred Alternative are considered insignificant. Under the No Action alternative, industrial noise would continue to be the predominate form of noise pollution.

j. Floodplain Management.

The project area is located adjacent to the Ohio River which experiences occasional periods of flooding. The project lands are located within the 100 year floodplain and regulatory floodway and therefore do fall under the purview of Executive Order 11988. Floodplain information for the project location is located in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 39167C0266E dated February 16, 2006. The project area is in floodway areas of Zone AE which is defined by FEMA as the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. A previous project on the Ohio River of similar dimensions has shown no adverse impact on the regulatory floodplain and floodway (USACE, 2010). The Preferred Alternative is designed in a manner that will not result in increased flood heights in the regulatory floodplain within the vicinity of the project area, as well as areas both upstream and downstream. Additionally, the design of the Preferred Alternative prevents floodwaters from being impeded and diverted to areas previously not delineated within the regulatory floodplain. The nature of this Corps project does not result in incompatible use of the regulatory floodplain nor does it directly or indirectly encourage development of the floodplain.

Under the No Action Alternative, it is anticipated no stabilization measures or structured form of bank treatment would be employed. Therefore, the only alternations that are likely to occur to the physical properties of the floodplain would result from erosion and natural deposition

mechanisms of river systems. The mechanisms are present throughout the entire river system and not just specific to the identified project area. Under the No Action Alternative there would be no significant or adverse change to the regulatory floodplain.

k. Transportation and Traffic.

The project area is located along the Ohio River and can be accessed from Pierce Street and through the county maintenance and stockpile yard's river access ramp. Stone will be transported by dump trucks to the project location. Traffic will be affected by the project during the delivery of construction equipment and stone hauling along Pike Street, Jefferson Street, and Pierce Street. Pike Street (State Route 7) is the main principle arterial road through the City of Marietta. Jefferson Street is a two-lane road that experiences commercial traffic and Pierce Street is a two-lane rural roadway. The project will result in occasional temporary disruptions in the flow of traffic as heavy equipment and stone is moved in areas where construction is to take place. It is not anticipated that any delivery will cause a traffic stoppage. The project is adjacent to the county maintenance and stockpile yard which already sees an influx of equipment and stone to and from the site. Equipment and stone will be staged at a location on the site or county maintenance and stockpile yard. Impacts anticipated to occur from the Preferred Alternative would be minimal and temporary.

No impacts to transportation and traffic are anticipated to occur from the No Action alternative.

l. Environmental Justice.

Under Executive Order 12898 "Federal Action to Address Environmental Justice in Minority Populations and Low Income Populations," Federal agencies are directed to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low income populations. According to the U.S. Census Bureau, the City of Marietta has been losing population. It is estimated that the city has lost approximately 3% of its year 2000 population of 14,515. Approximately 94.4% of the population is white. The median family household income is \$41,060 compared with \$59,208 for the state of Ohio. Individuals residing in the city below the poverty level is 23.9% compared to 13.6% statewide.

The Preferred Alternative does not unfairly affect any segment of the population, because the collection line serves all residences and business in Marietta. The proposed project would have no effect on minority and low-income populations and therefore is in compliance with Executive Order 12898.

m. Health and Safety.

Currently, debris such as tires and metal car parts litter a portion of the project area presenting a safety hazard to people accessing the site. The Preferred Alternative will increase safety at the site by removing debris. The Preferred Alternative has been designed to stabilize the bank to protect the sewer line, thereby minimizing ground water and pollution in the Ohio River. The dike height decreases along a 20 foot section to maintain river access for the county maintenance

yard, thus allowing the county to safely access the site. The dike should not cause a safety concern to navigation because is not an active mooring and fleeting area.

Under the No Action alternative discharge of untreated wastewater would result in significant adverse effects to aquatic life in the river and may result in serious human health issues for downstream communities drawing water from the Ohio River.

n. Cumulative Effects.

The Corps of Engineers 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 (Federal or non-Federal) 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).

The cumulative effects analysis is based on the potential effects of the proposed project when added to similar impacts from other projects in the region. An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the analysis and states that "when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment. ...and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 CFR 1502.22).

Construction of the preferred alternative would have very localized effects confined to the area immediately in the vicinity of the project, therefore the geographic limit of the analysis is confined to the reach of the Ohio River adjacent to the City of Marietta. Project life of longitudinal dike projects are considered to be 50 years, therefore, that is the future temporal boundary of this analysis. The boundary for the past would coincide with the construction of the Belleville Lock and Dam in 1965 when the pool level was permanently modified. This cumulative effects discussion recognizes extensive cumulative effects analysis (CEA) completed for the Ohio River Mainstem System Study (ORMSS) in 2006. Within that analysis, ten resources were thoroughly examined and an exhaustive list of reasonably foreseeable future actions (RFFAs) was developed. The RFFAs were grouped by Navigation Investment Actions, Other Corps Actions, "But For" Action (actions that would not occur but for the navigation system), Actions by Others, Natural Climatic Events, and Regulatory Environment.

Based on this assessment, this project will have no significant impact on any resources within the geographic and temporal boundaries established for this CEA. The ORMSS CEA, however, did identify two resources that are marginally sustainable along the river: riparian resources and mussels. Since the proposed action would not result in impact to either of these resources, there is no potential for this project to increase nor decrease the cumulative impact of all past, present, and reasonably foreseeable future actions.

SECTION VI. HYDRAULIC ANALYSIS

Stone requirements for streambank protection in the project area are based on the criteria and procedures outlined in EM 1110-2-1601 *Hydraulic Design of Flood Control Channels*. Hydraulic information was derived from a previously developed HEC-RAS one-dimensional flow model developed by the Huntington District. The nearest cross section to the protected area is River Mile 171.03, as measured downstream of Pittsburg, PA. The average channel velocity for the 100-year discharge was computed to be 5.2 feet per second at the protected area. The maximum channel depth of the 100-year discharge at this location was calculated to be approximately 49-feet, and approximately 35-feet at the location of the treatment. Average channel boundary shear stress was calculated to be 0.19 lb/ft².

The recommended gradation limits for the stone size distribution are provided in Table 1; but a gradation using a larger D₃₀ value may be used if more practicable. This gradation represents the values outlined in EM 1110-2-1601 for a 0.61 Flood Frequency Data derived from a previous hydrologic and hydraulic analysis are contained in Table 2. These values were derived from a gage at St Mary's, West Virginia (RM 155) and are based on a period of record November 1937 – July 1972.

Table 1 *Gradation Limits for Stone Slope Protection*

PERCENT LIGHTER BY WEIGHT	MAXIMUM STONE DIAMETER (IN.)	MINIMUM STONE DIAMETER (IN.)
D ₁₀₀	15	11
D ₉₀	N/A	10.5
D ₅₀	10	8.8
D ₃₀	N/A	7.2
D ₁₅	7.9	3.6

Table 2 *Frequency-Discharge Relationship Based on Marietta Gage*

RECURRENCE INTERVAL (YEARS)	DISCHARGE (CFS)	APPROXIMATE WATER SURFACE ELEVATION (FT.)
500	518,000	622.4
200	467,000	619.0
100	434,000	616.6
50	397,000	613.7
20	347,000	610.1
10	314,000	607.4
5	276,000	604.2
2	228,000	600.5
1	187,000	597.0

The stage data was analyzed for the period of record at the Marietta, Ohio gage from January 1985 to March 2011. This data was utilized to construct the stage-duration curve displayed in Figure 6. A stage duration curve indicates the amount of time, as a percentage of the total time that a stage is equaled or exceeded. Analysis of this gage also suggests that on average September and October have the lowest flow and lowest chance of flood, although flooding can occur at any time of the year.

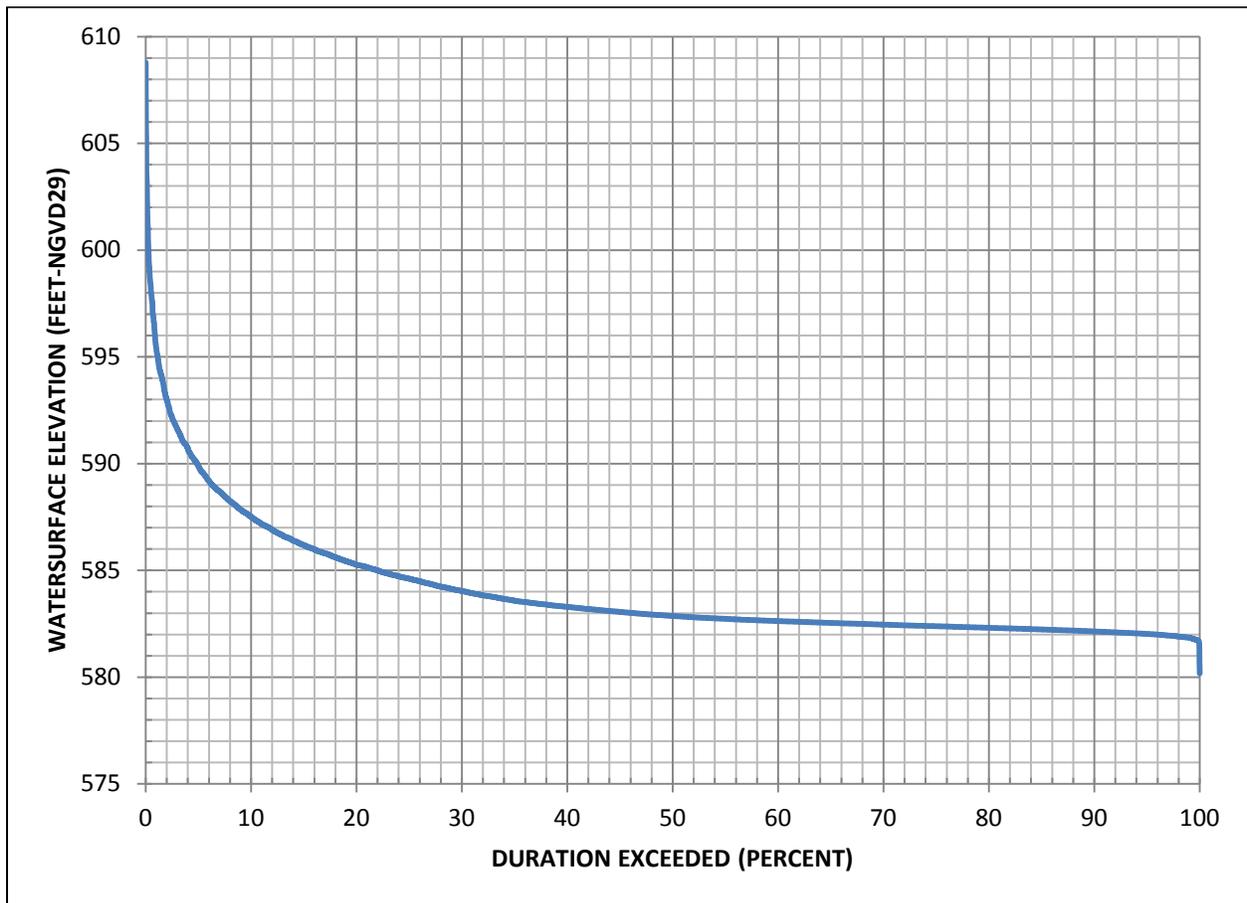


Figure 6 *Elevation Duration-Exceedance Plot for Marietta Ohio*

SECTION VII. ECONOMIC COSTS FOR SELECTED ALTERNATIVE

A cost estimate for the Preferred Alternative was completed based on August 2011 prices and conditions. Total non-fully funded cost to construct this project is estimated to be \$405,918. The fully funded cost is estimated to be approximately \$410,000.

ESTIMATED ECONOMIC COSTS FOR PROJECT ALTERNATIVES FY 2011 Price Level	
Preferred Alternative	
Non-Fully Funded Project Cost	\$405,918
Estimated Annual Project Cost (4% for 50 years)	\$18,896
Annual Operations and Maintenance	\$2,000
Total Annual Economic Cost	\$20,896
Relocation Alternative	
Estimated Project Cost	\$1,200,000
Estimated Annual Project Cost (4% for 50 years)	\$55,860
Annual Operations and Maintenance	\$0
Total Annual Economic Cost	\$55,860

*Costs are subject to change as a result of Agency Technical Review.

SECTION VIII. ECONOMIC JUSTIFICATION FOR SELECTED ALTERNATIVE

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 Preferred Alternative.

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

$$\text{BCR} = \frac{\$55,860}{\$20,896}$$

$$\text{BCR} = 2.67$$

SECTION IX. REAL ESTATE REQUIREMENTS

Investigations indicate that the City of Marietta does own a sewer easement along the bank of the Ohio River within the project area. The existing easement is insufficient to accomplish the proposed work. Additional easements will be acquired by the Non-Federal Sponsor. The land required for the project is approximately 1.21 acres of streambank protection easement across five private property owners. A six month temporary work area easement for 0.83 acre will also be required across one private property owner. Non-standard estates are not proposed for this project. There are no existing federal projects within the proposed project's area. The United States owns a flowage easement for the Belleville Lock and Dam up to elevation 595 feet, mean sea level. Consent will be provided as part of the normal Section 404 regulatory permitting process. The total real estate cost is \$10,349.

SECTION X. PUBLIC INVOLVEMENT AND COORDINATION

1. Required Coordination.

Coordination with Federal and state resource agencies was conducted in conjunction with the preparation of the Section 14 Emergency Streambank Protection, Draft Environmental Assessment, City of Marietta, Washington County, Ohio. All correspondence letters can be found in Appendix B. The USFWS, West Virginia Division of Natural Resources (WVDNR), United States Department of Agriculture (USDA), and ODNR have all been asked to review the project for potential negative resource impacts. The Corps will coordinate with the OHPO to address any concerns or recommendations regarding impact to historic properties during the 30-day public review period.

2. Public Involvement.

The Draft Environmental Analysis and Planning Design Analysis will be available to the local community, state and Federal governmental agencies, the general public, and other interested agencies and groups for a 30-day review/comment period as required by NEPA.

A Notice of Availability (NOA) will be prepared and published in the Marietta Times based in Marietta, Ohio regarding this document. All comments received during the 20-day review period will be considered in the Final Environmental Assessment and Planning Design Analysis.

SECTION XI. CONCLUSIONS

No significant adverse impacts have been identified with implementation and construction of a longitudinal dike at the proposed location. Short term impacts associated with construction of the longitudinal dike would be localized and minor. Long-term beneficial effects on the environment would be realized by project implementation through the prevention of sewer line failure with subsequent discharge of raw sewage as well as of localized sedimentation and reestablishment of riparian corridor vegetation in the project area.

SECTION XII. REFERENCES

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