

Mississippi River, Dubuque County Iowa
Continuing Authorities Program Section 14
Emergency Streambank Protection

Dubuque Forced Sewer Main

Feasibility Report and
Integrated Environmental Assessment



Doc Version: Draft Feasibility Report
October 2021



**US Army Corps
of Engineers**®
Rock Island District

Mississippi River, Dubuque County Iowa
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Executive Summary

The Study area is comprised of approximately 3,000 linear feet of riverbank south of the City of Dubuque, Iowa. The *Dubuque Forced Sewer Main Section 14 Study* (Study) is experiencing extended periods of high water and natural processes on the Mississippi River that have caused the right descending bank to erode. Natural processes along the riverbank have eroded the entire area with some areas of severe scour. This erosion has exposed the Dubuque Forced Sewer Main which transports 80% of the City of Dubuque's wastewater. Years with extended periods of high water allowed these conditions to become worse. While these processes will continue to occur, this Study provides the opportunity to restore protection to vital infrastructure. Alternatives to this problem were evaluated and analyzed in this report to find the best solution. The Project Delivery Team tentatively selects Alternative 1, riprap revetment, to stabilize and protect the project area.

All alternatives were evaluated against the Planning and Guidance criteria. The alternatives not selected consisted of driving sheet piling and using articulated concrete block matting. These alternatives lacked constructability and cost more than the tentatively selected alternative.

A riprap revetment was the least cost alternative to fulfill the project objectives. The project first cost is estimated at \$5,128,000. The cost would be split between the Non-Federal Sponsor 35% and USACE 65%. The total amount of federal funds is estimated to be \$3,333,000.

ACRONYMS

APE - Area of Potential Effect
ACM - Articulated Concrete Matting
BLM-GLO Bureau of Land Management's General Land Office
CAP - Continuing Authority Program
ER - Engineer Regulation
EA - Environmental Assessment
ESA - Environmental Site Assessment
EO - Executive Order
FCSA - Federal Cost Share Agreement
FONSI - Finding of No Significant Impact
GIS - Geographic Information System
HTRW - Hazardous, Toxic, and Radioactive Waste
IFR/EA - Integrated Feasibility Report and Environmental Assessment
IDNR - Iowa Department of Natural Resources
LERRDS - Lands, Easements, Rights-of-way, Relocations, and Dredged or Excavated Material Disposal Areas
NED - National Economic Development
NEPA - National Environmental Policy Act
NHPA - National Historic Preservation Act
NPS NRHP - National Park Service's National Register of Historic Places
NWP - Nationwide Permit
NFS - Non-Federal Sponsor
O&M - Operation and Maintenance
IPaC - Planning and Consultation
REC - Recognized Environmental Conditions
RPBB - Rusty Patched Bumble Bee
SHPO - State Historic Preservation Office
TSP - Tentatively Selected Plan
UMRR – Upper Mississippi River
USACE - U.S. Army Corps of Engineers
USDA - U.S. Department of Agriculture
USFWS - U.S. Fish and Wildlife Service
WRDA - Water Resource Development Act

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1.0 INTRODUCTION

1.1 Purpose of the Report

The purpose of this Feasibility Report with Integrated Environmental Assessment (EA) is to evaluate the proposed project within the Continuing Authority Program (CAP) and ensure U. S. Army Corps of Engineers (USACE) planning guidance and National Environmental Policy Act (NEPA) requirements are met. The purpose of the Study is to formulate a plan using the USACE 6 Step Planning Process to stabilize the right descending riverbank of the Mississippi River on the southern edge of the City of Dubuque in Dubuque County, Iowa and to evaluate the potential effects of such action. This report provides planning, engineering, and preliminary construction details of the Tentatively Selected Plan (TSP). Final design and construction to proceed after the approval of the plan and receipt of appropriated funds for design and construction phases.

The report uses documented existing conditions, future without Project conditions, with Project future conditions, assesses the problem, provides and compares alternatives, and makes a recommendation to accomplish the emergency streambank protection (*Policy and Procedure for Implementing NEPA*).

1.2 Project Location

The Study area is approximately 2.5 acres in Pool 12 south of the City of Dubuque, approximate River Mile 578.5 – 577.8, in Dubuque County, Iowa. The Dubuque Forced Sewer Main Study area is on the west bank directly adjacent to the Mississippi River. A total of 8 parcels of land are within the study area. The land parcels are owned or occupied by Canadian National Railroad, and City of Dubuque.

The Study includes 3,000 feet of shoreline south of the Dubuque levee and terminates just north of the parking lot at the end of Julien Dubuque Drive (Figure 1). The City of Dubuque transports 80% of its wastewater through the sewer main to the treatment facility downstream.

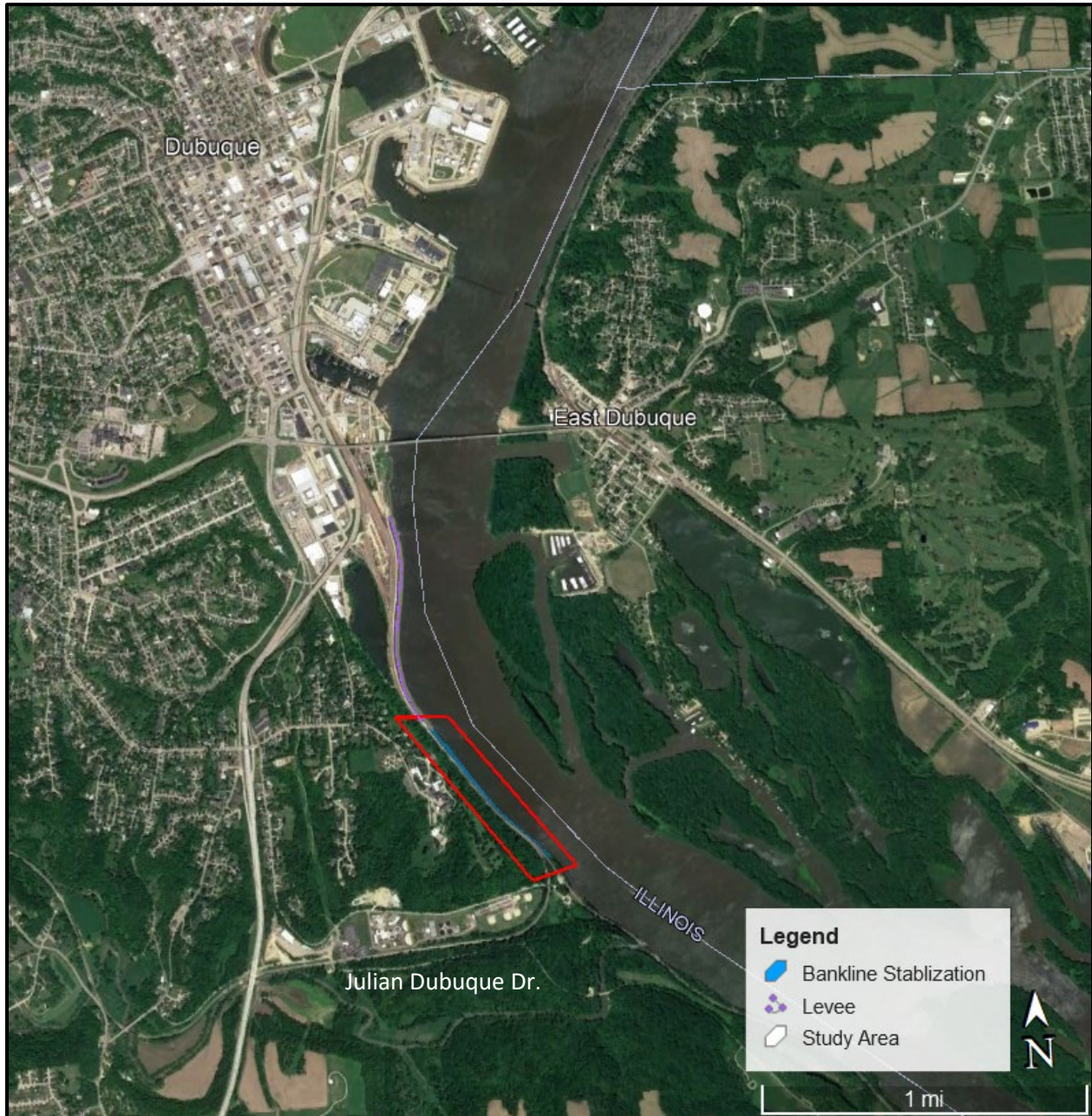


Figure 1. Study Location, Dubuque Forced Sewer Main, Dubuque County, Iowa

1.3 Project Sponsor

The City of Dubuque is the Non-Federal Sponsor (NFS). The NFS submitted a letter of intent that formally requesting assistance on 25 February 2020. A Federal Cost Share Agreement (FCSA) between USACE and the City of Dubuque was signed on 26 February 2021. The FCSA cost sharing agreement is cost shared 50% NFS and 50% federal funding of the feasibility Project cost, over the initial \$100,000 that is 100% Federally funded. The City of Dubuque will obtain any necessary easements or other real estate interests. The City of Dubuque is responsible for

all Operation and Maintenance (O&M) costs after Project completion. The City of Dubuque was heavily involved in the planning process ultimately giving approval when the TSP was selected. During construction and design phase USACE will work closely with the NFS.

1.4 Project Authority and Scope

The Project is authorized under Continuing Authorities Program (CAP) Section 14 of the Flood Control Act of 1946, as amended, Emergency Streambank Protection. CAP Section 14 is designed to implement projects to protect public or non-profit public facilities and/or services which are open to all on equal terms, have been properly maintained but are threatened by natural riverine processes on streambanks and shorelines, and are essential and important enough to merit Federal participation in their protection (ER 1105-2-100, F3). Additionally, the continued erosion would threaten the rail line directly adjacent to the Dubuque Forced Sewer Main. The scope of the study will encompass a 50-year planning horizon (beginning in year 2023) for the Study area (Figure 2).

The Rock Island District finds this Study has Federal Interest based upon the essential nature of the threatened public infrastructure and the opportunity to avoid a high-cost imminent failure by effecting low-cost stabilization in the near term. Study efforts are likely to lead to a project implementation. Final approval is projected for December 2021.

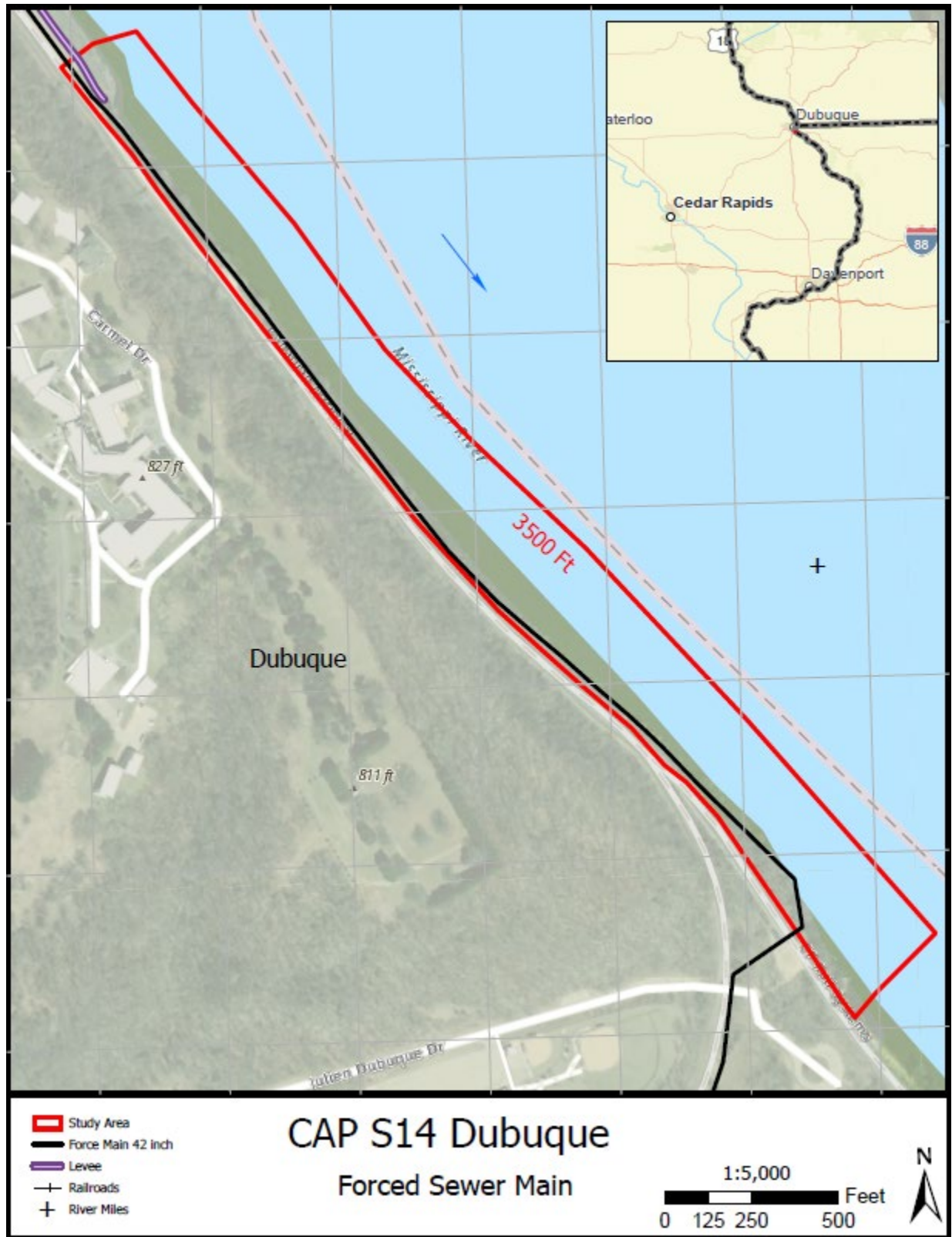


Figure 2. Dubuque Forced Sewer Main CAP 14 Project Site

1.5 Problems, Opportunities, Objectives, and Constraints (Purpose and Need)

This section presents results of the first step of the planning process, the water and related land resources problems and opportunities in the study area. The section also establishes the planning objectives and planning constraints, which are the basis for formulation of alternative plans.

1.5.1 Problems. Based on existing information as well as the purpose and need for action, Extended periods of high water and natural processes on the Mississippi River that caused the channel alignment to migrate west, eroding the outside bend. The Dubuque Forced Sewer Main transports 80% of Dubuque’s wastewater to the treatment facility for approximately 60,000 residents. Erosion patterns and rates are projected to continue, and likely to result in the failure of the Dubuque Sewer Main.

Forced Sewer Main is classified as critical infrastructure, in the surrounding area. Failure would result in direct discharge of untreated wastewater directly into the Mississippi River and is likely to have significant environmental impacts.

Debris strikes to the shoreline and sewer main are a frequent occurrence given the main channel flow alignment, resulting in severe scour, day lighting of the Dubuque Forced Sewer Main, and potential risk rupturing critical infrastructure (forced sewer main) .

1.5.2 Opportunities. The opportunity to address the problem of the Study is to protect the 42-inch Dubuque Forced Sewer Main while re-establishing the shoreline on the right descending bank of the Mississippi River from erosion processes. By protecting the Dubuque Forced Sewer Main it reduces the risk of environmental resources impacts resulting from bank stabilization failure.

1.5.3 Objectives. The 50-year period of analysis (beginning in 2023), the objective of the Study is to stabilize and reduce the rate of erosion and protect the critical infrastructure on the right descending bank of the Mississippi River within the Study area.

1.5.4 Planning Constraints and Considerations

A constraint is a restriction that limits the extent of the planning process. This includes legal and policy constraints that apply to all Federal water resources planning efforts and project-specific constraints. Section 14 of the 1946 Flood Control Act authorizes emergency streambank and shoreline erosion protection of public works and non-profit public services. A favorable balance must be established between the Sponsor’s financial capability and USACE design efforts.

Project-specific planning constraints considered during the study included avoiding impacts to threatened or endangered species and avoiding induced flooding impacts.

Potential habitat for some listed threatened and endangered bat and mussel species exists in the study area. During construction, USACE will comply with U.S. Fish and Wildlife Service (USFWS) best management practices to avoid impacts to tree roosting bats while removing trees.

As the non-Federal sponsor, the City of Dubuque will obtain any necessary easements or other real estate interests.

2.0 INVENTORY EXISTING AND FORECAST FUTURE CONDITIONS

The following describes the current conditions of the study area as well as projections about the future without project conditions. The future without project condition establishes a baseline condition to compare the effects of potential bank stabilization alternatives.

2.1 Hydrologic and Hydraulic Conditions

Flow frequency relationships utilized for this study were from the 2004 Upper Mississippi River (UMRR) Flow Frequency Study (Table 1). Previous 2018 and 2019 hydraulic modeling efforts in Corps Water Management System River Analysis System were utilized for depth information and approximate flow velocities. The maximum flow velocity in the study vicinity is 4.29 ft/sec. An approximate velocity distribution is shown in Figure 3. The possibility of propeller wash impacts exists in the study area from regular navigation. Additional information related to hydrology and hydraulics can be found in Appendix A, *Hydrologic and Hydraulic*.

Table 1. Discharge-Frequency Relationships for the Mississippi River Near Dubuque, Iowa. (UMRSFFS 2004)

Annual Chance Exceedance (ACE)	50% (2-yr)	20% (5-yr)	10% (10-yr)	4% (25-yr)	2% (50-yr)	1% (100-yr)	0.5% (200-yr)	0.2% (500-yr)
Discharge (cfs), 2004 FFS (RM 578.6)	127,000	169,000	195,000	228,000	251,000	274,000	297,000	326,000

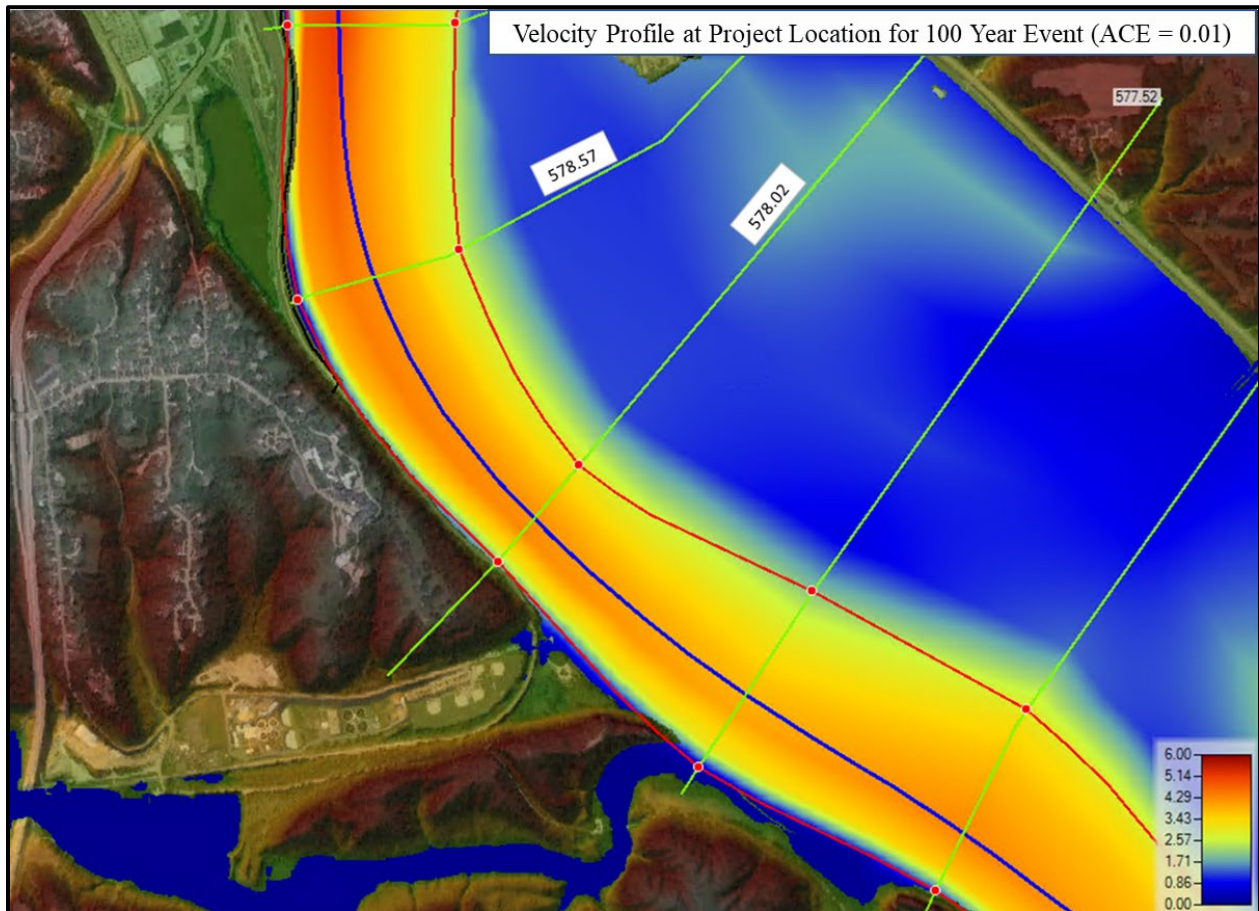


Figure 3. Velocity (ft/sec) Near Project Location

2.2 Geologic Conditions

The study area is located in the Paleozoic Plateau landform region of northeastern Iowa. This region is typically characterized by shallow bedrock that creates plateau-like uplands with thin loess covering and isolated patches of glacial drift. The terrain has many deep valleys created by downward erosion of streams through the rock strata. Over time the Mississippi River has eroded downward through the bedrock leaving behind steep, rocky bluffs upwards of 150 to 200 feet high in the Study area. Karstic features are common in this region, though there is no evidence to suggest they are present within the study boundaries.

Soil borings specific to the Study area are not available. However, the U.S. Department of Agriculture (USDA) Web Soil Survey places the Study area primarily in the Nordness-Rock outcrop complex. The Nordness soil series generally consists of silt loam and silty clay loam, both well-draining soil types. The study's location in and adjacent to the Mississippi River means most of the soil and sediments in the subsurface likely consist of typical alluvial materials consisting of sands, silts, clays, and even gravel. Due to the study's proximity to adjacent steep, rocky bluffs it is likely that larger rocky debris like cobbles and boulders exists in the subsurface soils.

There is a lack of bedrock data specific to the study area. The nearest borings to the site, provide possible bedrock conditions were selected from the Iowa Geological Survey's GeoSam website <https://www.ihr.uiowa.edu/igs/geosam/home>, a database of well and boring logs around the state. Selecting representative borings criteria included locations with similar proximity to the steep rock cliffs, relatively same elevation present at the study site. Specific well data can be found in Appendix D *Geotechnical Engineering and Geology* of this report. A total of three borings were selected that met the above criteria. These borings are approximately 0.6 and 2.0 miles upstream of the study site. One boring is roughly in line with the downstream end of the study site but approximately 0.2 miles inland in an old stream valley. All three of the well logs describe an Ordovician aged dolomite as the uppermost bedrock. The geologic unit differs between all three, but this is not unexpected as depth to bedrock is different in all three borings. Using flat pool (Elevation 595) as a baseline, depth to bedrock in the study area would range between 69 and 161 feet. It should be noted that the two borings upstream of the study site are a greater distance from the rocky bluff which may result in deeper bedrock in those locations. Depth to bedrock within the study boundaries ranges between a few feet to dozens of feet deep, reference Appendix D, *Geotechnical Engineering and Geology*.

Additional information related to geologic conditions can be found in Appendix D, *Geotechnical Engineering and Geology*.

2.3 Natural Resource Conditions

The Study area is located in a floodplain riparian zone along and immediately downstream of the City of Dubuque on the Mississippi River. The following paragraphs describe the natural resources found in the Study area vicinity and surrounding areas of the watershed.

2.3.1 Aquatic and Wetland Resources. The Study is located in Pool 12 of the UMRR between river miles 578.5 and 577.8, is part of the UMRR National Fish and Wildlife Refuge. Pool 12 of the Mississippi River extends 26.3 miles, has 12,349 acres of aquatic habitat, and is home to over 115 species of fish and 39 species of mussels (Mississippi River – Pool 12, 20121). Several forested islands, sloughs, and lakes are adjacent to the study area and provide habitat for birds, fish, and other wildlife. Just south of the study area, Catfish Creek empties into the Mississippi River. District biologists visited the Project site on April 29, 2021 to take sediment samples, using a ponar grab sampler, at seven different locations within the action area. The shore was also surveyed for dead mussel shells. Biologists found fine silt with small gravel at four of the seven locations. No dead mussel shells were found. Samples could not be collected at three of the locations where the ponar hit riprap. Additional information related to aquatic and wetland resources can be found in Appendix H, *Agency Coordination*.

2.3.2 Terrestrial Natural Resources. Previously placed riprap, the sewer main, and the railroad make up the majority of the action area. Several large trees with diameters over 10",

saplings ranging in size from 1-2" diameters, and brush grow along the riverbank. Mines of Spain State Park is located immediately southwest of the study area. The park is approximately 1432 acres of forest and includes a non-operational lead mine and rock outcroppings. The mines include potential winter habitat for bat species, though no records exist of Northern Long-eared Bat using this site (About Us - Mines of Spain, 2021). The UMRR National Wildlife and Fish Refuge land is located east of the study area. Several forested islands provide habitat for migratory birds, fish, and other wildlife. The study area falls within two Rusty Patched Bumble Bee (RPBB) zones: one low and one high potential zone. These zones indicate the likelihood of RPBB presence if suitable habitat is available (Service, 2021).

2.3.3 Threatened and Endangered Species. Federally-listed endangered and threatened species known to occur or potentially occur in Dubuque County include: the Northern long-eared bat (*Myotis septentrionalis*), Higgins Eye Mussel (*Lampsilis higginsii*), Spectaclecase Mussel (*Cumberlandia monodonta*), Sheepsnose Mussel (*Plethobasus cyphus*), Iowa Pleistocene Snail (*Discus macclintocki*), Monarch Butterfly (*Danaus plexippus*, Candidate) RPBB (*Bombus affinis*), Northern Wild Monkshood (*Aconitum noveboracense*), Prairie Bush-clover (*Lespedeza leptostachya*), and Western Prairie Fringed Orchid (*Platanthera praeclara*). Potential habitat for Northern Long-eared Bat, Higgins Eye, and Spectaclecase mussels is present at the action area (Appendix H).

Dubuque County is home to 80+ state listed species. These include mussels, birds, mammals, fish, insects, plants, snails, and reptiles. The study area may not provide suitable habitat for these species, however, they may utilize adjacent areas because of the proximity of the refuge. The Iowa Department of Natural Resources (IDNR) has known occurrence of Higgins Eye Mussel, Butterfly Mussel (*Ellipsaria lineolate*), Creeper Mussel (*Strophitus undulatus*), and potential occurrence of Sheepsnose Mussel (*Plethobasus cyphus*), Spectaclecase Mussel (state-endangered), and Western Sand Darter (*Ammocrypta clara*) within the vicinity of the study area. Burbot (*Lota lota*) maybe also be present in the study area as they likely inhabit the nearby Catfish Creek and move into the Mississippi River in fall/winter. For detailed information, see the IDNR's Natural Areas Inventory webpage for up-to-date information on state listed species: <https://programs.iowadnr.gov/naturalareasinventory/pages/RepDistinctSpeciesByCounty.aspx?CountyID=31>

2.4 Cultural Resource Conditions

The Iowa Office of the State Archaeologist's Online Geographic information system (GIS) and Database for Iowa Archaeology and the National Park Service's National Register of Historic Places (NPS NRHP) online GIS database were utilized to identify known archeological and cultural significant sites. Many known historic properties created during a range of human occupation periods in the region exist within a one-mile radius of the Area of Potential Effect (APE), including a National Register District associated with Julien Dubuque's Mines of Spain. Historical map resources including the Bureau of Land Management's General Land Office (BLM GLO) Records, Library of Congress, Sanborn Fire Insurance Maps, University of Iowa Libraries'

Iowa Counties Historic Atlases, and the 1837 loway Map GIS Project were utilized to identify known sites. Historic maps do not illustrate any historic properties or cultural sites within the APE for this Study area.

The original rail lines through the Study area were constructed sometime between 1863 and 1875 have experienced continuous operation and maintenance for over 145 years. It is unlikely any unknown historic properties meeting eligibility criteria for the NRHP remain undisturbed within the Canadian National Railroad right-of-way where the Study area occur.

2.5 Socio-economic Conditions

Dubuque County has an estimated population of 97,311 residents (U.S. Census Bureau, 2021). The population is increasing, Dubuque County grew by approximately 8,000 residents between 2000 and 2019, with only modest growth occurring between 2010 and 2019 (Table 2).

Table 2. Population of the State of Iowa and Dubuque County

	2000	2010	2019
Iowa	2,926,324	3,046,355	3,155,070
Dubuque County	89,143	93,653	97,311

U.S. Census Bureau

Of these residents, an estimated 90.6 percent identified as white. Table 3 shows the racial composition of Dubuque County and the State of Iowa between 2010 and 2019.

Table 3. Percentage of Population by Race

Race	Iowa	Dubuque	
	2019	2010	2019
White	90.6	91.7	92.5
Black or African American	4.1	4.0	3.6
American Indian & Alaska Native	0.5	.03	0.3
Asian	2.7	1.1	1.3
Native Hawaiian & Other Pacific Islander	0.2	0.5	0.6
Hispanic or Latino	6.3	2.4	2.6

U.S. Census Bureau and Bureau of Labor Statistics

2.5.1 Housing. Dubuque County has a home ownership rate exceeding that of the state average. In Dubuque County in 2019, an estimated 73.3 percent of homes were owned by their occupants while statewide, only 71.1 percent were owned by their occupants.

2.5.2 Employment. The unemployment rate in Dubuque County has fluctuated above and below the state unemployment rate throughout the years. The unemployment rate dropped by .1 percent between 2000 and 2019 and was below the state unemployment rate in 2019 (Table 4).

Table 4. Unemployment Percentage of Iowa and Dubuque County

	2000	2010	2019
Iowa	2.6	3.1	3.6
Dubuque County	3.2	5.8	3.1

U.S. Census Bureau and Bureau of Labor Statistics

2.5.3 Business and Industry. Dubuque County is home to several small and large businesses. The largest employer is John Deere Dubuque Works, employing approximately 2,600 people, followed by Dubuque Community Public Schools with just under 2,000 employees (Dubuque Iowa Major Employers, 2021).

2.5.4 Transportation. Dubuque Regional Airport is 8 miles south of the City of Dubuque on U.S. Highway 61. U.S. Highway 61 mostly follows the course of the Mississippi River and has been designated as the “Great River Road”. Highway 61 south leaves Wisconsin and enters Iowa on the Dubuque-Iowa bridge. An active rail line which both the Canadian Pacific and Canadian National both have operation right to runs through the City of Dubuque. It follows the right descending bank of the Mississippi, continuing through parts of Downtown Dubuque, and meets back with the right descending bank of the Mississippi near river mile 579.

2.5.5 Community Resources. Dubuque County offers a wide range of community resources for its residents including 13 public elementary schools, 3 middle schools and 3 high schools. The City of Dubuque is also home to the National Mississippi River Museum & Aquarium. There are multiple churches/places of worship, medical/emergency services, police, and fire departments.

2.6 Hazardous, Toxic, and Radioactive Waste (HTRW)

A Phase I HTRW Environmental Site Assessment (ESA) was conducted for the Study to determine if there is any risk of HTRW concerns within the Study area. The full report can be found in Appendix E, *Hazardous, Toxic, and Radioactive Waste*. The ESA has revealed no evidence of Recognized Environmental Conditions (REC) that could potentially affect the Study. No additional assessment or further investigation is recommended.

2.7 Future Without Project Condition

The future without Project would involve no Federal action to stabilize the Mississippi River bank in the study area. The future geologic and natural resource conditions assume that the land would continue to erode, which would result in the possible loss of vital infrastructure, aquatic habitat, as well as an increased sediment load into the Mississippi River as the bank line continues to erode. Failure of the sewer main would pollute the area with wastewater, creating a hazard for aquatic and recreational resources. There are no known significant architectural or archeological historic properties present in the Study area, so future without project conditions

would not impact historic properties. The socio-economic impacts of future without project conditions would be significant, as the loss of the Dubuque Forced Sewer Main would negatively impact the local and regional community since it transports 80 percent of the city's total wastewater.

The future hydrologic condition assumes there would be continued erosion of the Mississippi River, near and at the study area, ultimately leading to bank failure and the loss of the Dubuque Forced Sewer Main, an important infrastructure for the local community. The amount of erosion is dependent on flood events and there may be significant differences in erosion rates from year to year. Further information on the discussion on riverbank erosion, can be found in Appendix A, *Hydraulics and Hydrology*.

A qualitative assessment of climate change impacts on the hydrology of the Mississippi River Basin were evaluated in accordance with USACE Engineering and Construction Bulletin 2018-14, *Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs and Projects* (USACE, 2018, and USACE Engineering Technical Letter 1100-2-3, *Guidance for Detection of Nonstationarities in Annual Maximum Discharges* (Friedman D., et al.). The assessment found the available literature and USACE Climate Assessment tools do not demonstrate a statistically significant or operationally substantial change in observed or projected annual peak streamflow in the Mississippi River Watersheds of interest due to long-term persistent climate trends or anthropogenic climate change. Results of the qualitative analysis do not justify a need for a quantitative engineering-based analysis.

Based on this qualitative assessment, which shows minimal significant impact from climate change, the recommendation is to treat the potential effects of climate change as occurring within the uncertainty range calculated for the current hydrologic analysis. An example of adding resiliency to account for climate change impacts could be increased riprap sizing or altering bank line protection design due to higher projected river flows. The full qualitative analysis can be found in Appendix A, *Hydraulics and Hydrology*.

3.0 PLAN FORMULATION

The guidance for conducting civil works planning studies, Engineer Regulation (ER) 1105-2-100, Planning Guidance Notebook, requires the systematic formulation of alternative plans that contribute to the Federal objective. This chapter presents the results of the plan formulation process. Alternatives were developed in consideration of study area problems and opportunities as well as study objectives and constraints with respect to the four evaluation criteria described in the Principles and Guidelines (completeness, effectiveness, efficiency, and acceptability).

A management measure is a feature or activity that can be implemented at a specific geographic site to address one or more planning objectives. Potential measures are actions which contribute to achieving the Project objectives. The initial array of measures included:

1. sheet pile armoring,
2. riprap revetment,
3. articulated concrete block matting,
4. willow revetment.

More in-depth descriptions of the potential measures can be found in Appendix C, *Civil Engineering*.

Following a finding of eligibility, and given the narrow geographic focus, low cost of these projects, and the imminent threat to the facilities, the formulation and evaluation should focus on the least cost alternative solution. The least cost alternative plan is considered to be justified if the total costs of the proposed alternative is less than the costs to relocate the threatened facility. (ER 1105-2-100 F 23.d)

The willow revetment was determined to not be efficient as installation and establishment would be gradual. This would require the removal of existing riprap to establish the willows. Additionally, the constant stress of high velocities and high-water impacts made this measure not effective at reducing erosion over the 50 year project life. The Willow revetment measure was not carried forward for comparison and evaluation. The remaining measures, all commonly and successfully used for streambank protection and erosion control on the Mississippi River, were carried forward to alternative formulation. Figure 4 shows an example of a typical willow revetment.



Figure 4. Example of a Willow Revetment

The final array of alternatives included four alternatives, including three action alternatives and the No Action alternative. The final array of alternatives includes measures that could accomplish the objectives independently to meet Project goals. The value of lands, easements, rights-of-way, relocations, and dredged or excavated material disposal areas (LERRDs) is assumed to be approximately the same for each action alternative and therefore not calculated for each alternative. The value of LEERDs is estimated at \$122,000.

3.1 No Action

The No Action alternative is synonymous with no Federal Action. The No Action alternative would allow the erosion to continue and could potentially lead to the failure of the Dubuque Forced Sewer Main, resulting in an ecological disaster from discharging wastewater directly into the Mississippi River. There is no cost estimate associated with the No Action alternative, as no action would be taken that would incur Federal costs.

3.2 Alternative 1 (Riprap Revetment)

Alternative 1 consists of placing riprap revetment on the right descending bank. Riprap revetment is a blanket of riprap placed on an eroding bank to resist erosive flows and protect the bank from further erosion. Revetment can be used on most any bank, whether straight or meandering in geometry. Bank side slopes should be placed at a 1.5 to 3:1 H:V slope and armors the bank line from the toe of the bank up to 1 to 5 feet above normal pool height. Bank grading may be required to achieve the appropriate slope. The thickness of the placement is generally 18 to 36 inches, but the slope and thickness depend on the type of riprap, existing bank material, use of filter fabric or bedding stone, water velocity, and if the stone will experience freeze/thaw or ice action. The cost per ton of class C riprap is \$130. Table 5 gives the estimated first cost of Alternative 1.

Table 5. Project First Cost Estimate for Alternative 1

Item	Cost	Contingency	Project First Cost
Construction	\$2,923,000	\$718,000	\$3,641,000
LEERDs	\$120,000	\$2,000	\$122,000
Preconstruction Engineering and Design	\$817,000	142,000	\$959,000
Construction Management	\$350,000	\$56,000	\$406,000
Total	\$4,210,000	\$918,000	\$5,128,000

3.3 Alternative 2 (Sheet Piles)



Figure 5. Example of Typical Sheet Piling

Sheet piles are metal sheets pressed or molded to interlock with other such sheets. They are driven into the earth as piles and can be used to retain water, soil, or other materials. Depending on length, they are generally driven into the earth with a pile driving crane. They can be placed along a variety of geometries, including curved paths such as a river bend. Sheet piles work both by holding back soil that is eroding into the river and by serving as armor against the river’s erosive forces. Table 6 gives the estimated first cost of Alternative 2

Table 6. Project First Cost Estimate for Alternative 2

Item	Cost	Contingency	Project First Cost
Construction	\$9,293,000	\$2,326,000	\$11,620,000
LEERDs	\$120,000	\$2,000	\$122,000
Preconstruction Engineering and Design	\$2,603,000	\$452,000	\$3,055,000
Construction Management	\$1,115,000	\$177,000	\$1,292,000
Total	\$13,131,000	\$2,958,000	\$16,089,000

3.4 Alternative 3 (Articulated Concrete Block Matting)

An Articulated Concrete Block Matting (ACM) revetment is a system of interconnected concrete block units installed to provide an erosion resistant revetment. It is static protection and is applicable in high-risk applications where no additional bank or grade movement is allowable. The system consists of concrete blocks, a filter typically made of a geotextile, and cables in some products. The individual units are connected by geometric interlock, cables, ropes,

geotextiles, geogrids, or a combination thereof and, typically, overlay a geotextile for subsoil retention. The filter layer may consist of a geotextile, properly graded granular filter, or both. Proper design of the filter layer is critical to the successful performance of the ACM revetment system. The individual blocks of the system can conform to changes in the subgrade, while remaining connected due to the geometric interlock or other system components such as cables (Figure 6). Table 7 gives the estimated first cost of Alternative 3.

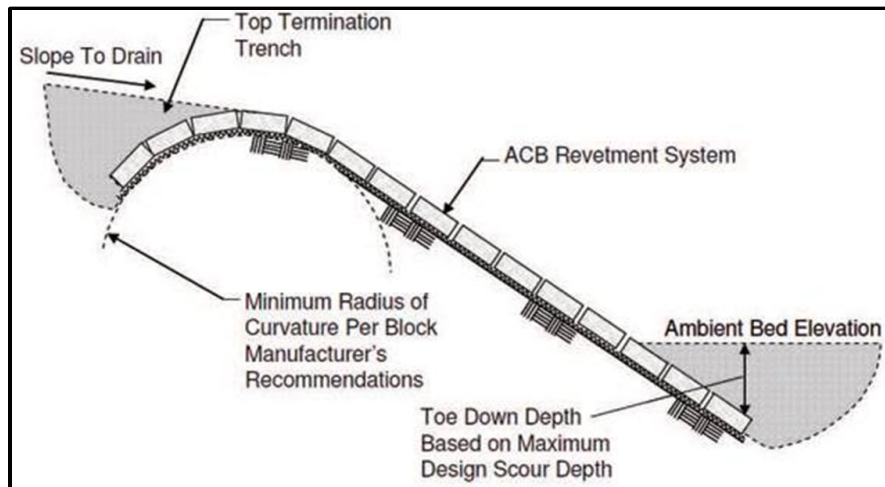


Figure 6. Articulated Concrete Block Matting Cross Section

Table 7. Project First Cost Estimate ROM for Alternative 3

Item	Cost	Contingency	Project First Cost
Construction	\$4,023,000	\$995,000	\$5,018,000
LEERDs	\$120,000	\$2,000	\$122,000
Preconstruction Engineering, and Design	\$995,000	\$326,000	\$1,321,000
Construction Management	\$482,000	\$77,000	559,000
Total	\$5,620,000	\$1,400,000	\$7,019,000

3.5 Comparison and Evaluation of Alternatives

In accordance with planning guidance, alternatives must be compared to consider their completeness, effectiveness, efficiency, and acceptability. Completeness refers to the extent that an alternative plan provides all necessary investments or actions to assure realization of the planned effect. Effectiveness refers to an alternative’s ability to alleviate the specified problems and achieve the opportunities. Efficiency refers to the extent of an alternative plan’s cost effectiveness in alleviating the problems and achieving the opportunities. Acceptability refers to the workability and viability of an alternative with respect to acceptance of Federal, state, and local entities and general public and compatibility of existing laws, regulations, and public policies. When considering efficiency, planning guidance requires CAP Section 14 projects select the least cost alternative that will address the problems and meet the planning objectives. Following ER 1105-2-100 F 23.d, Formulation and Justification: Following a finding of

eligibility, and given the narrow geographic focus, low cost of these projects, and the imminent threat to the facilities, the formulation and evaluation should focus on the least cost alternative solution. The least cost alternative plan is considered to be justified if the total costs of the proposed alternative is less than the costs to relocate the threatened facility (ER 1105-2-100, *Planning Guidance Notebook*). Table 8 summarizes the cost estimates for each alternative.

Table 8. Project First Cost Estimate for Alternative Plans (July 2021 Dollars)

Alternative	Project First Cost
No Action	\$0
Alternative 1 (Riprap Revetment)	\$5,128,000
Alternative 2 (Sheet pile Wall)	\$16,089,000
Alternative 3 (ACM Revetment)	\$7,019,000

The No Action Alternative is an acceptable, complete, and efficient plan, although it is not an effective plan in addressing the Project objectives.

Alternative 1 is an acceptable, complete, efficient, and effective plan in addressing the Project objectives.

Alternative 2 is a partially acceptable, complete, not efficient, and partially effective plan in addressing the Project objectives. Driving the sheet piles through existing riprap/boulders/cobble will likely prevent reaching required embedment depths on the piles and lead to damaged/misaligned piling. It is more expensive than Alternative 1. Sheet pile is not designed to withstand heavy repeated debris impacts. The flat surface of the sheet pile wall may invite barge traffic to the area resulting in an increase in impacts that would affect long term durability.

Alternative 3 is a partially acceptable, complete, not efficient, and partially effective plan. After further analysis during the comparison and evaluation of alternatives, Alternative 3 was determined to be ineffective in achieving Project objectives. ACM needs a relatively flat, uniform slope to be placed properly. This will be difficult to accomplish in the wet area at the Project site. The bedding beneath the ACM would require multiple layers including two layers of geotextile fabric with one layer of bedding stone in between. This is more complex and would require more materials than the single layer of bedding stone that would be needed for the riprap alternative. The wires/cable that hold the blocks of the mat together are not intended to withstand impacts; they are simply used to hold the blocks together during placement. Debris strikes would very likely lead to breaking of these cables and result in the loss of blocks. The area required to properly anchor the ACM requires a larger amount of land than is available in the area in-between the river and rail line. This Alternative is more expensive than Alternative 1. Table 9 compared the Principle and Guideline criteria of all alternatives.

Table 9. Principles and Guidelines Criteria

	Completeness	Effectiveness	Efficiency	Acceptability
Alternative # 1 (Riprap Revetment)	Yes. The alternative includes all features needed to produce the stated effects.	Yes. The alternative optimizes risk reduction of damages associates with erosion, and extended periods of high water.	Yes. This alternative is a cost effective means of providing reduction of damages to vital infrastructure.	Yes. The alternative is viable and in accordance with state and local entities and the compatibility with existing laws.
Alternative # 2 (Sheet Pile Armoring)	Yes. The alternative includes all features needed to produce the stated effects.	Partially. The alternative optimizes risk reduction of damages associate erosion and extended periods of high water. However, it will not withstand navigation traffic for the life of the project.	No. This alternative is not a cost effective means of providing reduction of damages to vital infrastructure.	Partially. The alternative is viable and in accordance with state and local entities and the compatibility with existing laws.
Alternative # 3 (ACM)	Yes. The alternative includes all features needed to produce the stated effects.	Partially. The alternative optimizes risk reduction of damages associates with erosion and extended periods of high water. However, it will not withstand navigation traffic for the life of the project.	No. This alternative is not a cost effective means of providing reduction of damages to vital infrastructure. It is not meant to be used in an area with such limited space.	Partially. The alternative is viable and in accordance with state and local entities and the compatibility with existing laws.
No Action	Yes. No Action requires no additional features and assumes erosion trends will continue.	No. The alternative does not alleviate the problems identified and does not meet the objectives of the project.	No. While no money is expended, no benefits are gained, problems are not alleviated, and objectives are not met.	Yes. However, the alternative does not have the support of local population.

Project Authorization and Need: The intent of Section 14 is for emergency streambank restoration. As such, the repair needs to be constructed and start functioning in a timely manner. Alternative 1 is the least costly and requires the least amount of man hours to complete the Project. ER 1105-2-100 Appendix F, Amendment #2 31 Jan 07 d. Formulation and Justification. Following a finding of eligibility, and given the narrow geographic focus, low cost of these projects, and the imminent threat to the facilities, the formulation and evaluation should focus on the least cost alternative solution. The least cost alternative plan is considered to be justified if the total costs of the proposed alternative is less than the costs to relocate the threatened facility.

3.6 Description of the Tentatively Selected Plan

The TSP is Alternative 1 (Riprap Revetment) which consists of placing IA DOT Class C Riprap along the eroded bank line (Figure 7). This size class of riprap accounts for the possibility of propeller wash. This Project feature was designed to be 24 inches thick and sloped at 2:1 H:V, to be used along the right descending bank of the Mississippi River. The revetment does not include a weighted toe. The stone bedding thickness will be a minimum of 12" above the Dubuque Forced Sewer Main. A 6-inch-thick section of bedding stone will be used on all other areas not directly above the Dubuque Forced Sewer Main in the Project (see figure 8 for typical section). A maintenance access drive is not included in the TSP as it is not feasible due the limited space available to avoid impacts to the sewer main and remain within proposed easement lands. The existing riprap stone will be reworked and repositioned, as necessary, to provide a good base prior to placement of new stone on top. Trees will be removed in the area of riprap placement. Tree removal will not negatively impact the integrity of the Dubuque Forced Sewer Main. During construction, USACE will comply with U.S. Fish and Wildlife Service (USFWS) best management practices to avoid impacts to tree roosting bats while removing trees. As the non-Federal sponsor, the City of Dubuque will obtain any necessary easements or other real estate interests.

A floating construction plant is proposed for placement of bedding and riprap along the entire length of the Project. Temporary installation of steel spud bars for mooring are anticipated to be used for mooring construction barges in place. To minimize the amount of bottom disturbance and impacts to mussel species spudding would be constrained to the staging and study area. Construction easements will need to remain within easement and agreement while railroad flaggers are present. The staging area is proposed to be at Ice Harbor on city-owned property (Figure 9). The approximate material quantities and labor estimates are summarized in Table 10 and table 11, below.

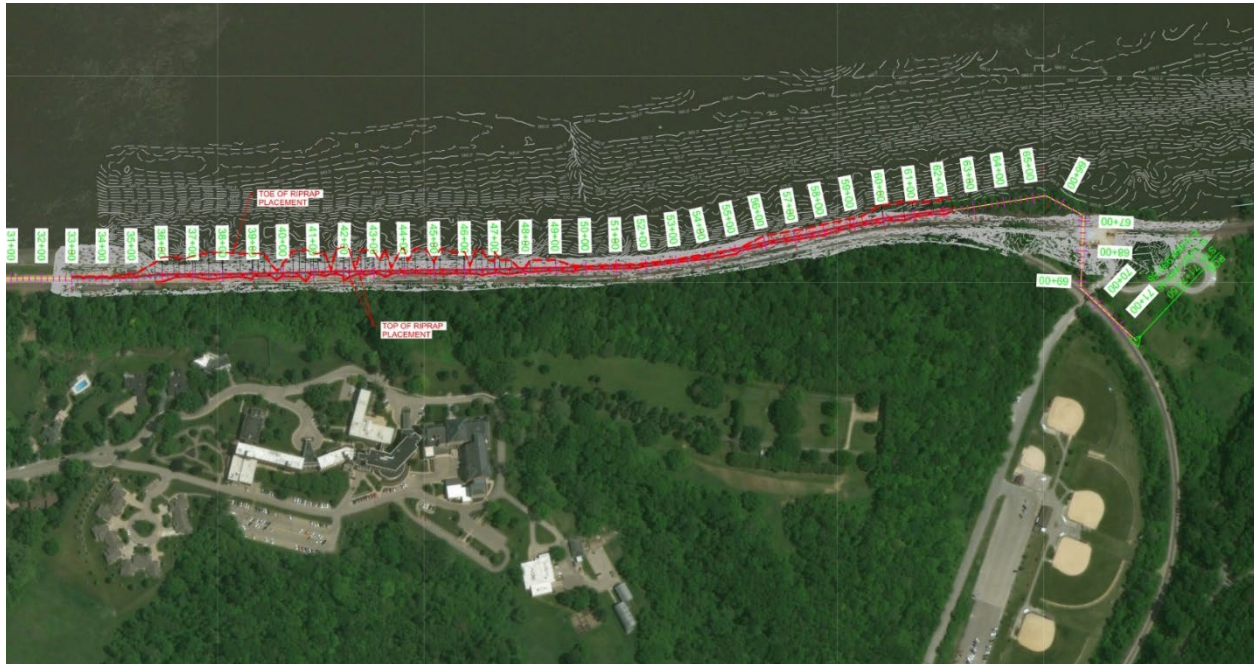


Figure 7. Location of Proposed Riprap Revetment

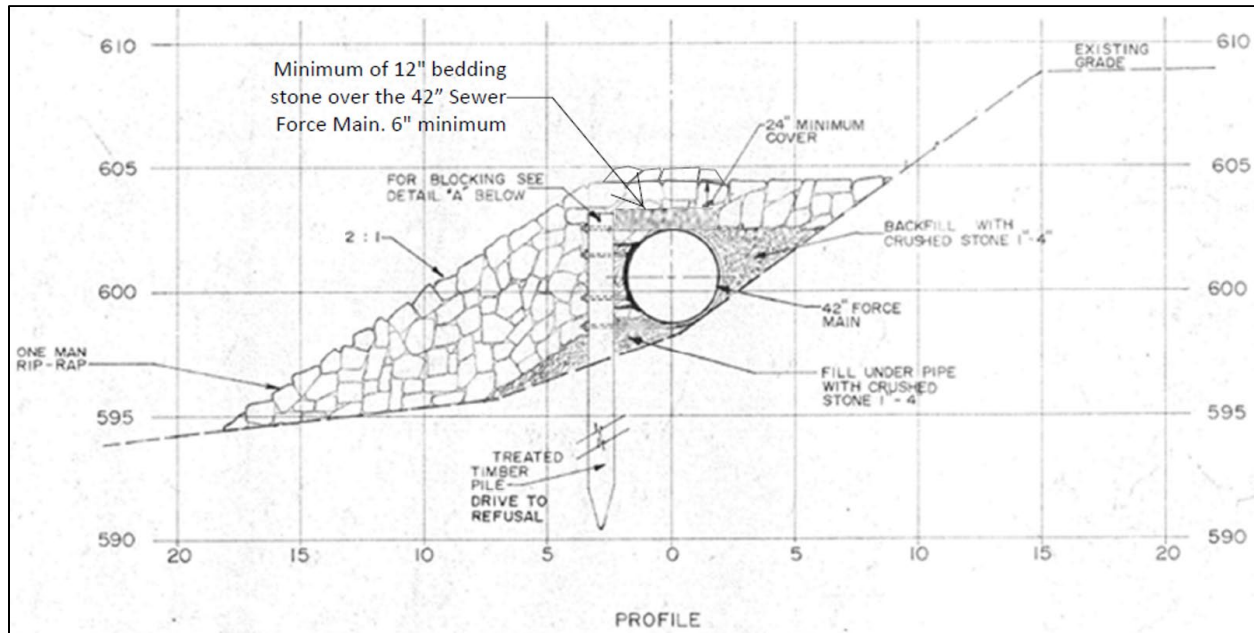


Figure 8. Typical Section



Figure 9. Potential Staging Areas

Table 10. Summary of Tentatively Selected Plan Features and Quantities

Feature	Labor Hours	Locations	Total Length (ft)	Riprap (CY)	Riprap (TN)
Riprap Revetment	640	RDB	3,000	16,000	22,400
Stone Bedding	133	RDB	3,000	4,400	6,380

3.7 Tentatively Selected Plan Cost Estimate

Based on July 2021 price levels, the Project first cost is \$5,128,000 for the TSP, including the value of Lands, Easements, Right of Way and Disposal sites (LEERDs). In accordance with the cost share provisions of Section 104 of the Water Resources development Act (WRDA) of 1986, as amended (33 U.S.C. 2213), the Federal share (65%) of the Total Project Cost (fully funded) is estimated to be \$3,520,000 and the non-Federal share (35%) is estimated to be \$1,895,000 (including LEERDs). Table 11 provides the cost breakdown for total project cost. Detailed information on Project costs can be found in Appendix F, *Cost Engineering*.

Table 11. Total Project Cost

Item	Cost	Contingency	Project First Cost
Construction	\$2,923,000	\$718,000	\$3,641,000
LERRDs (not incl. Real Estate Acquisition)	\$96,000	\$0	\$96,000
(Real Estate Acquisition)	\$24,000	\$2,000	\$26,000
PED	\$817,000	\$142,000	\$959,000
Construction Management	\$350,000	\$56,000	\$406,000
TOTAL	\$4,210,000	\$918,000	\$5,128,000

Operations and Maintenance (O&M) for the Project is considered minimal and the responsibility of the NFS. Maintenance would include yearly inspections of the riprap, removal of unwanted vegetation growing within the riprap, and possibly minor riprap replacement. The limited access to the project site will likely require O&M to occur from the river. The estimated annual O&M costs for the Project would be approximately \$23,000, which is estimated with the assumption that 5% of the Project materials (riprap) will need to be replaced every 10 years. Estimated Annual O&M is outlined in Table 12.

Table 12. Estimated O&M Costs for the Tentatively Selected Plan

Material/Activity	Total Qty for Construction	Unit of Measure	5% Replace	Unit of Measure	Budget Cost	Unit Cost	Maintenance Cost per Year
Riprap Revetment	22,400.00	TON	15,000	TON	\$2,909,000	\$130	\$23,000

3.8 Economic Assessment

3.8.1 Methodology. This study assessed the feasibility of providing protective action to curtail bank erosion threatening the Dubuque Forced Sewer Main. The annual benefits and costs of the proposed action were computed using 2022 price levels and a 2.25 percent discount rate, with a 50-year period of analysis (beginning in year 2023).

3.8.2 Benefits of Protective Action. The benefits of protective action are derived from considering what would occur if no Federal Action were taken.

3.8.2.1 Annualized Benefits. At the recent erosion rates, it is estimated that the failure of the Dubuque Forced Sewer Main is imminent. Therefore, the benefits of Project implementation would be the annual costs avoided by Project construction (versus relocation) over the period of analysis (50 years, beginning at year 2023). Total annual costs avoided are \$499,000 (50-year period of analysis at 2.5%). This amount is the annual benefit of Project implementation.

3.8.3. Estimated Cost of Recommended Action. The estimated Project First Cost (at FY22 price level) of the TSP is \$5,128,000.

3.8.3.1. Annual Costs. Total Project costs were annualized over a 50-year period at a 2.5 percent rate, as shown in Table 13. Interest during construction was not included due to the short construction period. Annual first costs are \$172,000 and annual O&M is \$23,000 (rounded for economic analysis purposes).

Table 13. Total and Annualized Project Costs

First Cost	Annual First Cost	O&M	Total Annual Costs (Rounded)
\$5,128,000	\$172,000	\$23,000	\$195,000

3.8.3.2. Benefit and Cost Summary. As shown in Table 14, the Project exhibits Federal interest with \$499,000 in net benefits, and a benefit-to-cost ratio of 2.6 to 1.0.

Table 14. Benefit and Cost Summary

Total Annual Benefits	Annual Costs	Annual Net Benefits	Benefit-to-Cost Ratio (Rounded)
\$499,000	\$195,000	\$304,000	2.6 to 1

4.0 ENVIRONMENTAL EFFECTS

An environmental analysis is currently in progress for the TSP and a discussion of the impacts. It is anticipated that no significant adverse impacts would result from the construction of the Project. Impacts are similar for all proposed action alternatives including the preferred alternative. Table 16 summarizes the anticipated effects of the No Action alternative and the TSP.

4.1 Natural Resources Effects

4.1.1 Air Quality. No impacts to air quality and no violations of existing air quality standards would be anticipated to occur if the proposed project is not implemented. The operation of construction equipment may result in a short-term localized reduction in air quality. Adverse effects would be limited and short-term, as they are associated only with construction.

Greenhouse gas emissions and their effect on climate change are global issues resulting from numerous and varied sources, with each source making a relatively small addition to global atmospheric greenhouse gas concentrations. Additionally, the ability to accurately predict the localized or short-term effects of changes in greenhouse gas emissions is extremely limited. Nevertheless, it is imperative for agencies to identify the potential emissions from project alternatives when it may inform the agency’s decision-making.

The Project would be expected to produce greenhouse gasses during construction activities in the form of exhaust from various types of machinery used for material transport placement. Based on the scope of the Project and the amount of material required to move and construct

the Project, it is expected that the metric tons of CO₂-equivalent greenhouse gas emissions would be minimal. Therefore, a detailed analysis of greenhouse gas emissions is not required and has not been prepared for the TSP.

4.1.2 Surface Water Quality. Under the No Action Alternative, minor negative impacts to surface water quality, primarily localized increases in suspended solids, could occur due to unchecked erosion of the riverbank at this location. Continued erosion could lead to the failure of the forced sewer main. This would cause raw sewage to spill into the Mississippi River, impacting the water quality in the immediate area.

The action alternatives would have no long-term negative effects on water quality of the Mississippi River. Preventing future bank erosion at the Project site could have a minor positive effect on sediment deposition in the main channel downstream of the Project area, particularly in the long term. Water quality, especially water clarity, may be briefly reduced during construction. Any reduction in clarity would fade following construction.

4.1.3 Aquatic and Wetland Resources. Under the No Action alternative, negative impacts to aquatic and wetland resources are anticipated. Erosion of the riverbank could continue to occur causing the failure of the sewer main. USACE anticipates failure of the Dubuque Forced Sewer Main would lead to poor living conditions and death for aquatic wildlife, including fish, waterfowl, mussels, and other benthic invertebrates, although these anticipated impacts are not quantifiable. Construction of the TSP is anticipated to result in some short-term negative impacts to aquatic resources in the immediate construction area. Invertebrates present in the Project footprint could be buried or crushed by the placement of riprap. However, other benthic and aquatic organisms would be expected to quickly recolonize the new rock substrate. Fish and other mobile aquatic life may avoid the area during construction but would return upon completion. The new riprap may attract fish and provide some low level of habitat value. No long-term adverse impacts would be anticipated to wetlands, aquatic habitat, or biota. The Project would not contribute toward the long-term impairments for fish and invertebrates. The action alternatives should stabilize the streambank, reduce probability of bank failure and erosion of bank materials, and benefit the Mississippi River aquatic habitat.

4.1.4 Terrestrial Natural Resources. The aerial footprint extent of the Project, including the staging area in Ice Harbor, is estimated at approximately 25 acres. Under the No Action Alternative, no short-term adverse impacts due to construction would occur. Over the long term, continued destabilization of the riverbank could cause the loss of some trees and vegetation, as well as the failure of the sewer main. Construction of the TSP would result in the clearing of 2.5 acres of trees and understory vegetation for riprap placement, construction access, and slope reduction to a lower grade. Trees to be removed range in size from 1-2" diameter saplings to several large trees with diameters over 10." Wildlife may temporarily avoid the Project area during construction but would return following construction. No long-term adverse impacts to terrestrial habitat or biota would be anticipated outside of the immediate stabilization site.

4.1.5 Threatened and Endangered Species. USACE reviewed the USFWS Information for Planning and Consultation (IPaC) website and requested an Official Species List from the Illinois-Iowa Ecological Services Field Office on July 28, 2021 (updated list requested October 5, 2021) (Appendix H). Federally-listed endangered and threatened species known to occur or potentially occurring in the Project area include the Northern Long-eared Bat, Higgins Eye Mussel, Spectaclecase Mussel, Iowa Pleistocene Snail, Monarch Butterfly (Candidate) RPBB, Northern Wild Monkshood, Prairie Bush-clover, and Western Prairie Fringed Orchid Table 15. There is no critical habitat for any listed species near the Project area work limits.

The Northern Long-eared Bat roosts and forages in upland woods and forests during summer months, and hibernates in caves and mines during winter months, swarming in surrounding wooded areas in autumn.

The Higgins Eye Mussel prefers habitat with stable substrates in deep water with moderate current. Spectaclecase Mussel are found in large rivers and prefer firm mud or areas sheltered from fast current, such as between boulders, under rock slabs, and tree roots.

The Project area does not include prairie remnant, prairie, prairie wetland, mesic prairie, sedge meadow, shaded to partially shaded cliffs, algific talus slopes, or moist, sandy floodplain habitat. Additionally, the Project areas are located along the main channel of the Mississippi River. Therefore, suitable habitat for the Eastern Prairie Fringed Orchid, Northern Wild Monkshood, Prairie Bush Clover, Western Prairie Fringed Orchid, Iowa Pleistocene Snail, Monarch butterfly, and RPBB is not present in the Project work area limits. Implementation of the Project is not expected to affect any habitat suitable for these species that may be present in the Project area vicinity (Table 15).

Table 15. Generated List of Federally-listed Species from IPaC 2021

Common Name	Scientific Name	Classification	Habitat
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Spends the winters hibernating in caves or mines with constant temperatures. During the summer, they roost in cavities or crevices of both live and dead trees
Higgins Eye Mussel	<i>Lampsilis higginsii</i>	Endangered	Larger rivers where it is usually found in areas with deep water and moderate currents
Spectaclecase Mussel	<i>Cumberlandia monodonta</i>	Endangered	Found in large rivers where they live in areas sheltered from the main force of the river current. This species often clusters in firm mud and in sheltered areas, such as beneath rock slabs, between boulders and even under tree roots
Iowa Pleistocene Snail	<i>Discus macclintocki</i>	Endangered	Found in the leaf litter of special cool and moist hillsides called algific talus slopes
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate	In the spring and summer, the Monarch Butterflies habitat is open fields and meadows with milkweed.
Rusty Patched Bumble Bee	<i>Bombus affinis</i>	Threatened	Found in areas that contain natural and semi-natural upland grassland, shrubland, woodlands, and forests
Eastern Prairie Fringed Orchid	<i>Platanthera leucophaea</i>	Threatened	Shade intolerant species found in variable habitats from mesic prairies to wetlands.
Northern Wild Monkshood	<i>Aconitum noveboracense</i>	Threatened	Typically found on shaded to partially shaded cliffs, algific talus slopes, or on cool, streamside sites. These areas have cool soil conditions, cold air drainage, or cold groundwater flowage.
Prairie Bush-clover	<i>Lespedeza leptostachya</i>	Threatened	Only in the tallgrass prairie region of four midwestern states.
Western Prairie Fringed Orchid	<i>Platanthera praeclara</i>	Threatened	Occurs in moist tallgrass prairies and sedge meadows

Under the No Action alternative, USACE anticipates negative impacts to Higgins Eye Mussel and Spectaclecase Mussel if the sewer main were to fail, although the impacts are of an unknown magnitude. Impacts to other federally listed species in Dubuque County would be minimal.

USACE has determined the proposed action will have no effect to Eastern Prairie Fringed Orchid, Northern Wild Monkshood, Prairie Bush Clover, Western Prairie Fringed Orchid, Iowa Pleistocene Snail, Monarch Butterfly, and RPBB. The TSP would require the removal of trees identified as having the potential to be used by the Northern Long-eared Bat. Additionally, the TSP would include the placement of riprap within an area identified as having the potential to be used by both Higgins Eye Mussel and Spectaclecase Mussel. The District made the determination the Project may affect but is “not likely to adversely affect” Northern Long-eared Bat, Higgins Eye Mussel, and Spectaclecase Mussel, for the following reasons:

- Tree clearing is restricted to the period of October 1 – March 31, when bats are unlikely to be present
- Marginal suitable habitat for Northern Long-eared Bat would be removed within the Project area
- Sediment samples indicate minimal suitable mussel habitat within the project area for listed mussel species
- Disturbance to river bottom would be confined to the action and staging areas
- No Designated or Critical Habitat in project area occur

Coordination with USFWS began on August 25, 2021 and is ongoing. Compliance with Endangered Species Act is pending.

4.2 Cultural Resource Effects

Most of the proposed repair area consists of Modern Channel and Late Holocene Channel Belt soils (LSA 2015). The major topographic feature of the Dubuque North quadrangle, in which the Project is located, is the broad steep-walled Mississippi River valley; bedrock topography in the quadrangle is in the youthful stage of erosion except in the southwest corner in the vicinity of the Project area where it is in the mature stage (Geological Survey Bulletin 1123-C). The area in which the subject repairs are proposed to occur primarily consists of Nordness-Rock outcrop complex, with 18 to 60 percent slopes, and approximately 50 percent coverage of 8-20 inches of Nordness and similar soils to lithic bedrock. Nordness soil is well-drained, in a very high runoff class, with low water capacity. At the northern end of the repair area, approximately 65m of shoreline is identified as Psammets-urban land complex (unconsolidated sand deposits). At the southern end of the repair area, approximately 288m of shoreline is identified as Worthen and Arzenville silt loams, with 0 to 5 percent slopes and more than 80 inches of depth to any restrictive feature; this soil is moderately-well to well-drained and in a low runoff class.

The District Archeologist consulted the Iowa Office of the State Archaeologist and NPS NRHP online GIS and Databases and noted no previous cultural surveys or known historic properties within the Area of Potential Effect (APE). Additional review of digital historical map resources

online (BLM GLO Records, Library of Congress, Sanborn Fire Insurance Maps, University of Iowa Libraries' Iowa Counties Historic Atlases, and the 1837 Iowa Map GIS Project) did not identify any historic properties or cultural sites within the APE for this Project. The original rail lines through the Project area have experienced continuous operation and maintenance for over 145 years. Combined with the geomorphological profile of the Project area, a very low potential for the presence of unknown historic properties meeting eligibility criteria for the NRHP exists within the railroad right of way where the proposed Project is to occur.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the District determined there will be **no historic properties affected** with the Tentatively Selected Plan. The District coordinated this determination with the Iowa State Historic Preservation Office (SHPO) and appropriate tribal representatives. The Iowa SHPO concurred with this determination on July 28, 2021. The Miami Tribe of Oklahoma responded on July 29, 2021 with no concerns. No concerns or objections were received from any other tribe.

Although the District has made a determination of **no historic properties affected** for the proposed Project, if any construction activities and ancillary actions result in the discovery of potentially significant historic properties, the undertaking will be discontinued, the IDNR/SHPO will be formally notified, and coordination with agencies, tribes, and other interested parties on the list will be resumed to identify the significance of the historic property and determine any effects.

4.3 Social and Economic Effects

4.3.1 Noise. Noise generated by heavy equipment used during construction may bother residents near the Project area. However, this impact would be short-term and relatively minor. No sensitive receptors are present in the Project vicinity and no noise ordinances would be violated.

4.3.2 Aesthetics. Site preparation and the placement of materials for bank stabilization activities would result in a minor intrusion on the visual environment. Construction activities would be short-term and relatively minor. While the post-construction presence of riprap would be a permanent intrusion, the area of placement is a relatively short stretch of the river, and the overall impact would be minor.

4.3.3 Recreation. Use of the Mississippi River for fishing and other boating activities near the Project could be disrupted during construction. Public shore fishing access is not available through the Project area. The action alternatives would have no permanent, long-term impacts on the recreational environment.

Under the No Action alternative, recreational activities such as fishing and other boating activities could be substantially and adversely impacted due to continued erosion of the bank and the threat of failure of the bank. Failure of the sewer main could cause a potential health hazard for recreators.

4.3.4 Safety. Construction activities would result in an increase in heavy equipment traffic adjacent to the Project area in the navigation channel. To maintain safety, the city is coordinating with the railroad to obtain flaggers. These effects would be attenuated through the appropriate placement of construction and safety signage or other safety measures. These effects would be short-lived and would cease when construction is complete.

Under the No Action alternative, public health and safety would be substantially and adversely impacted if continued bank erosion undermines the Dubuque Forced Sewer Main, as well as the rail line. The action alternatives would not have long-term adverse effects on public safety at the site. The Project would help protect both the Dubuque Forced Sewer Main and the rail line.

4.3.5 Economy and Employment. The action alternatives would have negligible beneficial impacts on the socioeconomic environment of Dubuque County. It is possible that construction activity could result in a minor short-term infusion of income into the local economy due to purchase of materials from local vendors or employment of persons from the local area, particularly if the construction work is awarded to a local contractor.

4.3.6 Environmental Justice. Environmental justice is a national goal and is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. No adverse economic or social effects would be anticipated under the action alternatives. Under the No Action alternative 80% of the city of Dubuque would be affected if the sewer main were to fail. Environmental justice communities maybe disproportionately affected if a sewer main failure required displacement from business or residence or purchasing of supplies/ equipment until the sewer main is repaired Public involvement, via distribution of information concerning the Project, has and will continue to be an integral part of planning to ensure that concerns of all people will be fully considered in the decision-making process.

4.3.7 Public Facilities and Services. The action alternatives would have no long-term adverse effects on public facilities or services. The Project would help protect the Dubuque Forced Sewer Main and rail line, which would provide an improvement to its continued use. The No Action alternative could have a substantial adverse effect on public services if erosion were to continue to the point of damage to the Dubuque Forced Sewer Main, resulting in its inability to continue as part of the city's critical infrastructure.

4.4 Reasonably Foreseeable Effects

The District's TSP is to place riprap along the right descending bank of the UMRR between river miles 578.5 and 577.8 in the City of Dubuque, Iowa. USACE considered direct and indirect impacts of the TSP and determined minor impacts to social and natural resources are anticipated to occur. Refer to Table 16 for the EA Matrix. Although the action alone should not cause immediate significant impacts, bringing the riverbank back to its originally stabilized state should prevent future erosion and failure of the sewer main.

Table 16. Environmental Assessment Matrix

No Action Alternative Future Effects Compared to Existing Conditions (Effects of Nature)				Symbols: X = Long-Term Effect T = Temporary Effect				Proposed Alternative Effects of Project Compared to No-Action Effects (Effects of Project)			
BENEFICIAL		ADVERSE		PARAMETER				BENEFICIAL		ADVERSE	
SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT					SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT
			X				A. Social Effects				
				X			1. Noise levels				T
					X		2. Aesthetic Values				T
			X				3. Recreational Opportunities				T
				X			4. Transportation				T
						T	5. Public Health and Safety		X		
					X		6. Community Cohesion (Sense of Unity)		X		
				X			7. Community Growth and Development				X
			X				8. Business and Home Relocations				X
			X				9. Existing/Potential Land Use				X
			X				10. Controversy				X
							B. Economic Effects				
			X				1. Property Values				X
			X				2. Tax Revenue				X
			X				3. Public Facilities and Services				X
			X				4. Regional Growth				X
			X				5. Employment				X
			X				6. Business Activity				X
			X				7. Farmland/Food Supply				X
			X				8. Commercial Navigation				X
			X				9. Flooding Effects				X
			X				10. Energy Needs and Reserves				X
							C. Natural Resources Effects				
			X				1. Air Quality				T
			X				2. Terrestrial Habitat				T
			X				3. Wetlands				T
					T		4. Aquatic Habitat				T
			X				5. Habitat Diversity and Interspersion		X		
			X				6. Biological Productivity				X
				X			7. Surface Water Quality				X
			X				8. Water Supply				X
			X				9. Groundwater				X
			X				10. Soils				X
			X				11. Threatened or Endangered Species				X
							D. Cultural Resources Effects				
			X				1. Historic Architectural Values				X
			X				2. Prehistoric & Historic Archeological Values				X

5.0 ENVIRONMENTAL COMPLIANCE AND REVIEW

5.1 Applicable Environmental Laws and Executive Orders

The proposed action would comply with Federal environmental laws, Executive Orders (EO) and policies, and applicable State and local laws. This chapter provides documentation of how the TSP (agency preferred alternative) complies with all applicable Federal environmental laws, statutes, and executive orders. Table 17 includes a summary of the status of compliance activities.

5.2 Clean Water Act of 1972 (Sections 404 and 401)

The District will comply with Section 404 by meeting the conditions of Nationwide Permit 3. Documentation of compliance and authorization from Rock Island District's Regulatory Division can be found in Appendix G. Section 401 water quality certification has been issued and Nationwide Permit (NWP) 3 – Maintenance by the Iowa Department of Natural Resources and therefore would apply to the proposed action. As Project designs are refined, USACE will continue to coordinate with the state and will obtain all permits required by Federal law.

5.3 Fish and Wildlife Coordination Act of 1934

As required by the Fish and Wildlife Coordination Act, this Project is currently being coordinated with the USFWS, as well as with the IDNR. Coordination will continue during the development of the Project's plans and specifications, which will address construction methods and best management practices to avoid and minimize any impacts to the environment.

5.4 Endangered Species Act of 1973

The District has determined the proposed action "May affect, but is not likely to adversely affect" Northern Long-eared Bat, Higgins Eye Mussel, and Spectaclecase Mussel, and will have "no effect" to Eastern Prairie Fringed Orchid, Northern Wild Monkshood, Prairie Bush Clover, Western Prairie Fringed Orchid, Iowa Pleistocene Snail, Monarch Butterfly, and RPBB. These determinations were made following the review and receipt of an official species list from the USFWS IPaC website. The District began coordinating these determinations with USFWS on August 25, 2021. Coordination with USFWS and the IDNR is currently on going. Additional information on Resource Agency coordination is present in Appendix H. USACE will not sign a FONSI until the Project is in full compliance with the Endangered Species Act.

5.5 National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations 36 CFR Part 800: "Protection of Historic Properties," establishes the primary policy and authority for preservation activities and compliance procedures (Public Law 89-665; 16 U.S.C. 470 et seq.). The NHPA ensures early consideration of historic properties preservation in Federal undertakings and the integration of these values into each agency's

mission. The Act declares Federal policy to protect historic sites and values in cooperation with other nations, states, and local governments.

The identification of historic properties potentially affected by the implementation of this Project was fully described and documented under consultation with the Iowa State Historic Preservation Officer (SHPO), other state agencies, tribes, and other interested and consulting parties. Information concerning the absence of known significant historic properties and low probability of existence of unknown historic properties and low probability of existence of unknown historic properties within the APE was shared within all parties, as promulgated under the NHPA and its implementing regulations. This EA review period allows for further comment and consultation relative to the protection of historic properties.

By letter dated July 8, 2021, the District contacted the Iowa Deputy SHPO and federally recognized tribes with an interest in the area describing the Project, existing conditions, and historic data, and defined the APE (Appendix H, *Agency Coordination*). All comments received in response to this correspondence are included in the Project documentation.

Pursuant to Section 800.3 of the NHPA and to meet the responsibilities under the NEPA 1969, USACE has developed a preliminary Consulting Parties Distribution List as part of this formal correspondence. The development and maintenance of the list allows agencies, tribes, individuals, organizations, and other interested parties an opportunity to provide views and consult on any effects of this undertaking on historic properties resulting from the Project, to participate in the review of the Project, and to provide comments during the Project review period. The Rock Island District's intent is to keep this list updated throughout all stages of the Project and keep parties notified of changes or inadvertent discoveries of historic properties and to provide notices of availability of all formal correspondence, public notices, and reports.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the District determined there will be **no historic properties affected** with the Tentatively Selected Plan. The District coordinated this determination with the Iowa State Historic Preservation Office (SHPO) and appropriate tribal representatives. The Iowa SHPO concurred with this determination on July 28, 2021. The Miami Tribe of Oklahoma responded on July 29, 2021 with no concerns. No concerns or objections were received from any other tribe.

Although the District has made a determination of **no significant historic properties affected** for the proposed Project, if any construction activities and ancillary actions result in the discovery of potentially significant historic properties, the undertaking will be discontinued, the IDNR/SHPO will be formally notified, and coordination with agencies, tribes, and other interested parties on the list will be resumed to identify the significance of the historic property and determine any effects.

5.6 Executive Order 12898 Environmental Justice

Compliance with EO 12898, *Environmental Justice*, requires consideration of social equity issues, particularly any potential disproportionate impacts to minority or low-income groups.

Environmental justice issues have been considered during the planning of this Project and there would be no negative impact to minority or low-income populations affected by the proposed action.

5.7 Migratory Bird Treaty Act of 1918

Potential effects to migratory birds were considered during the planning of this Project. Because of the low-quality and disturbed nature of the Project area, there would be little potential for migratory bird take as defined by the Act.

5.8 Bald and Golden Eagle Protection Act

The Project area does not currently contain any known active or historic bald eagle nests. The District will continue to monitor the Project area for bald eagle nests, and coordinate with USFWS as necessary.

5.9 Executive Order 11988 (Floodplain Management)

Implementation of the preferred alternative would avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of the base floodplain. The preferred alternative also avoids direct and indirect support of development or growth (construction of structures and/or facilities, habitable or otherwise) in the base floodplain. Therefore, the Project would be in full compliance.

5.10 Executive Order 13122 Invasive Species

This Project does not authorize or carry out any actions that are likely to promote invasive species proliferation. Any subsequent occurrence of any invasive species in the Project vicinity should not solely be the result of the implementation of the Project. This Project is in full compliance.

Table 17. Environmental Regulations and Guidelines

Federal Environmental Protection Statutes and Requirements	Applicability/Compliance*
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum)	Full Compliance
Bald and Golden Eagle Protection Act	Full Compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full Compliance
Clean Water Act, Sections 404 and 401	Full Compliance
Coastal Zone Areas 16 U.S.C. 1451, et seq	Not Applicable
Corps of Engineers Planning Guidance Handbook (ER 1105-2-100)	Full Compliance
Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq	In Progress
Executive Order 11988, <i>Floodplain Management</i>	Full Compliance
Executive Order 11990, <i>Protection of Wetlands</i>	Full Compliance
Executive Order 12898, <i>Environmental Justice</i>	Full Compliance
Executive Order 13112, <i>Invasive Species</i>	Full Compliance
Farmland Protection Policy Act. 7 U.S.C. 4201, et seq.	Full Compliance
Federal Water Project Recreation Act, 16 U.S.C. 460-(12), et seq.	Not Applicable
Fish and Wildlife Coordination Act, 16 U.S.C. 601, et seq.	In Progress
Green House Gases, CEQ Memorandum 18, Feb 2010	Full Compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not Applicable
Migratory Bird Treaty Act of 1918 and Executive Order 13186 Migratory Bird Habitat Protection	Full Compliance
National Environmental Policy Act, 42 U.S.C. 4321, et seq	In Progress
Noise Control Act of 1972 (P.L. 92-574)	Full Compliance
National Historic Preservation Act, 54 U.S.C. 300101, et seq.	Full Compliance
Rivers and Harbors Act, 33 U.S.C. 403, et seq	Full Compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Not Applicable

* Full Compliance = having met all requirements of the statute for the current stage of planning

In Progress= Coordination is ongoing

Not Applicable = no requirements for the statute required

6.0 COORDINATION, PUBLIC VIEWS, AND COMMENTS

Throughout the planning process, the District has been coordinating with other agencies including USFWS, the State of Iowa Historic Preservation Office, the City of Dubuque, Canadian National Railroad, and Native American Tribes/Bands. The draft Feasibility Report and EA will be released for a 30-day public review and comment period. Additional information can be found in Appendix H, *Agency Coordination*.

6.1 Public Review

The District will circulate the draft Feasibility Report to the distribution list provided in Appendix I to solicit public input as part of the decision-making process. The District will post the Report on the District website. The District will integrate all comments received into their decision-making process.

7.0 SUMMARY AND CONCLUSIONS

The adverse impacts upon the affected environment would be minimal and temporary compared to the benefits gained by the proposed action. The Project would have no long-term significant impacts to water quality in the Mississippi River and infrastructure for the city of Dubuque, IA. However, there would be minor adverse impacts on aquatic habitat and minor temporary impacts on noise, terrestrial habitat, surface water quality, and air emissions associated with Project activities. The temporary adverse effects would cease when the Project is completed.

This EA has been prepared in accordance with NEPA; the Council on Environmental Quality, *Regulations for Implementing the Procedural Provisions for NEPA* (40 CFR Parts 1500 – 1508); and the Corps of Engineers, *Policy and Procedure for Implementing NEPA* (33 CFR Part 230).

8.0 REFERENCES

Census Bureau QuickFacts. 2021. U.S. Census Bureau QuickFacts: Dubuque County, Iowa.

<https://www.census.gov/quickfacts/dubuquecountyiowa>

Engineer Regulation 1105-2-100 F3

Geology of the Dubuque North Quadrangle, Iowa-Wisconsin-Illinois 1963

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Regulations for Implementing the Procedural Provisions for NEPA 40 CFR Parts 1500-1508

Service, U., 2021. USFWS: Rusty Patched Bumble Bee Map. [online] Fws.gov. Available at:
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USDA Web Soil Survey <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

FINDING OF NO SIGNIFICANT IMPACT

Mississippi River, Dubuque County Iowa Continuing Authorities Program Section 14 Emergency Streambank Protection

The U.S. Army Corps of Engineers, Rock Island District (USACE) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The final Integrated Feasibility Report and Environmental Assessment (IFR/EA) dated **DATE OF IFR/EA**, for the *Mississippi River, Dubuque County Iowa, Continuing Authorities Program Section 14, Emergency Streambank Protection* addresses proposed streambank stabilization to reduce the risk of erosion and the failure of the forced sewer main on the right descending bank of the Mississippi River in the City of Dubuque, Iowa. The final recommendation is contained in the Dubuque Forced Sewer Main Feasibility Report with Integrated Environmental Assessment.

The Final IFR/EA, incorporated herein by reference, evaluated various alternatives that would reduce flood risk in the Study area. The TSP is the National Economic Development (NED) Plan and includes:

- Placing IA DOT Class C Riprap along the eroded bank line
- Stone bedding thickness a minimum of 12" about the 42" forced sewer main
- A 6-inch-thick section of bedding stone would be used everywhere else in the project

In addition to a "no action" alternative, USACE considered three alternatives. The alternatives included:

Alternative 1. No Action. Under this Alternative, erosion would continue and could potentially lead to the failure of the Dubuque Forced Sewer Main, resulting in an ecological disaster from discharging wastewater directly into the Mississippi River. There is no cost estimate associated with the No Action alternative, as no action would be taken that would incur Federal costs.

Alternative 2. Riprap Revetment. (Preferred Alternative) This alternative is the District's Tentatively Selected Plan. Under this alternative riprap revetment would be placed on the right descending bank. Bank side slopes would be placed at a 2:1 H:V slope and armors the bank line from the toe of the bank up to 1 to 5 feet above normal pool height. Bank grading may be required to achieve the appropriate slope. The thickness of the placement is generally 18 to 36 inches, but the slope and thickness depend on the type of riprap, existing bank material, use of filter fabric or bedding stone, water velocity, and if the stone will experience freeze/thaw or ice action.

Alternative 3. Sheet Piles. Under this alternative, Sheet piles are metal sheets pressed that

would be molded to interlock with other such sheets and be placed along the riverbank. They are driven into the earth as piles and used to retain water, soil, or other materials. Depending on length, they are generally driven into the earth with a pile driving crane. Sheet piles work both by holding back soil that is eroding into the river and by serving as armor against the river’s erosive forces.

Alternative 4. Articulated Concrete Block Matting. Under alternative 4, Articulated Concrete Block Matting (ACM) revetment, a system of interconnected concrete block units, would be installed to provide an erosion resistant revetment. The bedding beneath the ACM would require multiple layers including two layers of geotextile fabric with one layer of bedding stone in between.

SUMMARY OF POTENTIAL EFFECTS:

For all alternatives, the potential effects were evaluated, as appropriate. Table 1 summarizes the potential effects of the Tentatively Selected Plan.

Table 1: Summary of Potential Effects of the Tentatively Selected Plan

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action	Positive Effects
Aesthetics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Aquatic resources/wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Invasive species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fish and wildlife habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Threatened/Endangered species/critical habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historic properties	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other cultural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Floodplains	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hazardous, toxic & radioactive waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Land use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Navigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Noise levels	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Public infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Socio-economics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Environmental justice	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tribal trust resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The TSP does not require compensatory mitigation.

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the Tentatively Selected Plan.

Public review of the draft IFR/EA and FONSI will be completed on **DATE DRAFT EA AND FONSI REVIEW PERIOD ENDED**. All comments submitted during the public review period will be responded to in the Final IFR/EA and FONSI.

OTHER ENVIRONMENTAL AND CULTURAL COMPLIANCE REQUIREMENTS:

A. ENDANGERED SPECIES ACT. Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined the TSP is anticipated to have “no effect” on Eastern Prairie Fringed Orchid, Northern Wild Monkshood, Prairie Bush Clover, Western Prairie Fringed Orchid, Iowa Pleistocene Snail, Monarch Butterfly, and Rusty Patched Bumble Bee. The TSP is “may affect, but not likely to adversely affect” Northern Long-eared Bat, Higgins Eye Mussel, and Spectaclecase Mussel. There is no designated critical habitat for any species at the Project area. The U.S. Army Corps of Engineers is currently coordinating “not likely to adversely affect” determinations with the U.S. Fish and Wildlife Service and seeking concurrence. This FONSI will not be signed until the Project is in full compliance with the Endangered Species Act.

B. NATIONAL HISTORIC PRESERVATION ACT.

NO HISTORIC PROPERTIES NOT ADVERSELY AFFECTED:

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the District determined there will be **no historic properties affected** with the Tentatively Selected Plan. The District coordinated this determination with the Iowa State Historic Preservation Office (SHPO) and appropriate tribal representatives. The Iowa SHPO concurred with this determination on 07/28/2021. The Miami Tribe of Oklahoma responded on 07/29/2021 with no concerns. No concerns or objections were received from any other tribe.

C. CLEAN WATER ACT SECTION 404 COMPLIANCE. Pursuant to the Clean Water Act of 1972, as amended, this project does not require section 404(b)(1) analysis. The District complies with Section 404 by meeting the conditions of Nationwide Permit 3.

D. CLEAN WATER ACT SECTION 401 COMPLIANCE. Section 401 water quality certification has been issued for Nationwide Permit (NWP) 3 – Maintenance by the Iowa Department of Natural Resources and therefore would apply to the proposed action.

OTHER SIGNIFICANT ENVIRONMENTAL COMPLIANCE:

The District considered and coordinated all applicable environmental laws with the appropriate agencies and officials.

Finding

Technical, environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the TSP would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date

Jesse T. Curry
Colonel, US Army
Commander & District Engineer