

DRAFT 404(b)(1) EVALUATION
St. Francis Basin Maintenance
West Basin Levee – Castor River Headwater Diversion Channel Scour Repairs
Cape Girardeau and Bollinger Counties, Missouri

I. Project Description

a. Location

The proposed scour repair measures are along the right descending bank (RDB) of the West Basin Levee – Castor River Headwater Diversion Channel, located near the town of Whitewater in Cape Girardeau and Bollinger Counties, Missouri (Figure 1). The proposed action is in the vicinity of levee baseline station 334+00 – 713+19, and includes approximately the lower 7 miles of the Castor River Diversion Channel above Block Hole.

b. General Description

- 1) The proposed work calls for the repair of ten total scour sites that have developed along the RDB of the Castor River Headwater Diversion Channel. Due to large flows and high velocities typical after rain events, head cutting has given rise to major scour problems along the banks of the Diversion Channel. Because of the close proximity of the levee to the RDB, the scour problems have the potential to undermine and destabilize the riverside levee slope. The problem is so widespread that individual spot-fixes are not suited to address the scope of the problem.

Proposed work, funding dependent, would take place in three phases (Table 1). Phase 1 scour repair was a similar project, but due to its nature and small size, was constructed under a Nationwide Permits.

Table 1. Proposed R-400 Quantities and Scour Lengths.

Scour Site	Phase	~ Length of Repair	R-400 Quantity Estimated	~ Repair Section Excavation (cubic yard)
1	2	121	1,392	96
2	2	2,609	30,011	2,069
3	2	1,228	13,779	1,000
4	2	1,210	13,577	985
5	2	4,475	50,212	3,643
6	3	1,894	16,192	993
7	3	13,069	103,648	5,213
8	3	7,902	51,678	3,213
9	4	302	3,308	240
10	4	502	3,415	186

All construction work would be conducted from the cleared top RDB. A four foot deep key with an 18-inch bottom width would be excavated and then filled with R-400 riprap. Since the riprap is to be placed in moving water, filter material was eliminated to simplify construction. The R-400 riprap would be sloped at no steeper than 1.5H:1V with a minimum R-400 thickness of 30-inches (Figure 2). Any excavated material from key construction would be placed as semi-compacted backfill between the RDB and the flood side levee toe of the West Basin Levee and have a maximum final thickness of 1 foot. The excavated material would be placed so that is slopes to drain away from the levee and towards the RDB. Placed excavated material would be seeded and mulched prior to project completion. No wetlands would be filled or otherwise affected.

Access to the project areas would be from County Highway N or State Highway 91 and then along an existing road on top of the West Basin Levee. All work would be from RDB. It is anticipated that no utilities would be disturbed as part of the proposed work.

c. Authority and Purpose

The proposed St. Francis Basin Project action is authorized as part of the Flood Control Act, 15 May 1928, as amended by the Acts of 15 June 1936, 18 August 1941, 24 July 1946, 17 May 1950, 27 October 1965, 13 August 1968, and 11 December 1973. The U.S. Army Corps of Engineers is not authorized to conduct work in the Castor River Diversion Channel unless necessary to protect the adjacent levee.

d. General Description of Dredged or Fill Material

1) General Characteristics of Material

Riprap – Only R-400 riprap would be used for the scour locations. No filter material or geotextile filter fabric would be placed as bedding material.

Backfill – Any excavated material from key construction would be placed as semi-compacted backfill between the RDB and the flood side levee toe of the West Basin Levee and have a maximum final thickness of 1 foot. The excavated material would be placed so that is slopes to drain away from the levee and towards the RDB. Placed excavated material would be seeded and mulched prior to project completion.

2) Quantity of Material

Riprap – Approximately are that 103,782 tons of R-400 riprap would be needed for the five scour repair locations for Phase 2. Approximately 171,520 tons of R-400 would be needed for the three scour repair locations for Phase 3, and approximately 6,723 tons of R-400 would be needed for the two scour repair locations for Phase 4. Since the riprap is to be placed in moving water, filter material was eliminated to simplify construction.

Backfill – Approximately of 7,793 cubic yards are expected to be excavated in Phase 2 repairs. Approximately of 9,419 cubic yards are expected to be excavated in Phase 3 and 426 cubic yards in Phase 4.

- 3) Source of Material – The riprap and associated silt fencing and other site protection measures would be provided from commercial sources. The backfill would be obtained from the excavation required for scour repairs.

e. Description of the Proposed Discharge Site(s)

- 1) Location – The project area is in Cape Girardeau and Bollinger Counties, Missouri and would drain via the Headwater Diversion Channel into the Mississippi River in the vicinity of Cape Girardeau, Missouri. The existing channel to be modified is the Upper Castor River – Headwater Diversion Channel, a permanent water body.
- 2) Size – The Headwater Diversion Channel ranges in widths from about 120 – 140 feet with a bottom width of approximately 60 feet. Banks are about 30 feet high and steeply sloped. The RDB is about 5 to 50 feet from the West Basin Levee toe. The Castor River Drainage Basin is approximately 550 square miles in size. Selective tree clearing has previously occurred as part of the Little River Drainage District’s levee maintenance program.
- 3) Type(s) of Habitat – Available in-stream habitat is sparse throughout the project area as there are few trees along the channelized ditch to provide any allochthonous input. The stream sediment load consists of shifty sands and very little stable habitat. The immediate riparian zone is dominated by grasses and weed species with no trees or shrubs. Outside the immediate vicinity of the ditch, the surrounding vegetation is in agriculture.
- 4) Timing and Duration of Discharge – Construction is scheduled to commence in the immediate future. Construction would take place as soon as possible, but every effort would be made to construct during periods of low water and dry conditions. Best management practices would be applied.

f. Description of Disposal Method

No vegetation would be cleared along the banks to allow for equipment access. Minimal amounts of excavation of the channel bottom would be necessary to create the suitable slope and drainage flows required during key construction. Construction would take place during periods of low water.

II. Factual Determinations

a. Physical Substrate Determinations

- 1) Substrate Elevation and Slope – Slopes not steeper than 1.5H:1V would be created by the R-400 at the scour locations. The key is to be excavated to roughly

30 inches below the existing bottom of the channel. Excavated material from key construction would be sloped to drain away from levee toe towards the RDB.

- 2) Sediment Type – Sediment is composed exclusively of Levees-Borrow Pits Complex, 0 – 25 percent slopes. However, the soils on the riverside of the levee still flood frequently. These soils are somewhat poorly drained and occur mostly as narrow strips that parallel levees where soil material has been excavated for use in constructing the levee. Due to large flows and high velocities typical after rain events, head cutting has given rise to major scour problems along the banks of the Diversion Channel. Because of the close proximity of the levee to the RDB, the scour problems have the potential to undermine and destabilize the riverside levee slope.
- 3) Dredged/Fill Material Movement – Material would be excavated from the existing RDB and deposited adjacent to the ditch for associated scour repair.
- 4) Physical Effects on Benthos – Excavation of sediment would have a minimal impact on benthos. Benthic communities would return to pre-existing conditions shortly after project completion.
- 5) Other Effects – not applicable.
- 6) Actions Taken to Minimize Impacts - The following actions would be implemented during construction to minimize impacts:
 - The recommended plan is the least environmentally damaging plan that is economically feasible.
 - Effective erosion control would be in place prior to construction and maintained throughout the construction period.
 - Construction would take place during periods of low rainfall and low water stages.
 - Discharge material would be clean and free of pollutants, contaminants, toxic materials, hazardous substances, waste metal, construction debris and trash, and other wastes.
 - Vegetation to be cleared would be the minimum necessary to allow for construction access.
 - Work would be accomplished from one side of the ditch.
 - All disturbed areas would be seeded within 30 days after construction is completed.
 - Heavy equipment shall be kept out of free flowing water.

- Construction debris would be kept from entering the ditch channel and shall be disposed of properly.
- Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the water.

b. Water Circulation, Fluctuation, and Salinity Determinations

- 1) Water. No change in water quality is expected due to this project.
 - a) Salinity – not applicable.
 - b) Water Chemistry – There would be no significant effects on water chemistry.
 - c) Clarity – There would be limited disturbances to water clarity during construction due to minor increases in suspended particulates and turbidity levels. Water clarity is expected to return to pre-construction levels shortly after construction is completed.
 - d) Color – Water color is not expected to change significantly.
 - e) Odor – Odor of the water is not expected to change significantly.
 - f) Taste – The taste of the water is not expected to change significantly.
 - g) Dissolved Gas Levels – Dissolved gas levels are not expected to change significantly.
 - h) Nutrients – Nutrients are not expected to change significantly.
 - i) Eutrophication – No significant changes to eutrophication rates are expected from the discharge.
 - j) Others - not applicable.
- 2) Current Patterns and Circulation
 - a) Current Patterns and Flow – Current patterns and flows are not expected to be altered.
 - b) Velocity – Water velocity is not expected to be affected. Average and low-flow conditions would not be affected.
 - c) Stratification – No significant changes to stratification are expected from project construction.
 - d) Hydrologic Regime – No significant changes to the hydraulic regime are expected.

- 3) Normal Water Level Fluctuations – The existing water levels in the ditches are determined by rainfall and channel capacity. No enlargement of the existing ditch is planned with the storage capacity within the ditch to remain the same. Water level fluctuations would remain the same.
- 4) Salinity Gradients – not applicable.

Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above.

c. Suspended Particulate/Turbidity Determinations

- 1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site – Minor increases in suspended particulates and turbidity levels are expected during construction. Best management practices would be used throughout the construction process to minimize the impact. Ambient conditions are expected to return shortly after completion of construction.
- 2) Effects on Chemical and Physical Properties of the Water Column
 - a) Light Penetration – Minor impacts are expected to light penetration due to an expected increase in turbidity levels during construction. Ambient conditions are expected to return shortly after completion of construction. The only trees in the project area are limited to the left descending bank (outside project limits).
 - b) Dissolved Oxygen – No change is expected due to the shallow water depth and currents.
 - c) Toxic Metals and Organics – No effect on toxic metals and organics are expected.
 - d) Pathogens – not applicable.

Aesthetics – Aesthetics would be temporarily impacted during construction due to the presence of construction equipment. Woody vegetation would not be cleared on left descending bank, no woody vegetation is within the project area.

- e) Others as Appropriate – None noted.

3) Effects on Biota

- a) Primary Production – Aquatic vegetation is limited within the existing ditch. The proposed work should have little effect on primary production after the banks revegetate.

- b) Suspension/Filter Feeders – Increased turbidity would be of short duration, and any organisms that are impacted should repopulate the area after project completion.
 - c) Sight Feeders – Resident fish are adapted to turbidity increases that occur after every rainstorm. Project-related turbidity increases would be minor compared to these natural events. Since fish and other sight feeder are highly mobile, project impacts to sight-feeding organisms would be insignificant and short term.
 - d) Actions taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above.
- d. Contaminant Determinations – It is not expected that any contaminants would be introduced or translocated due to construction. A hazardous, toxic, and radioactive waste survey has been conducted on the area. No potential sources of contamination were found. The discharge material would be clean and free of pollution. No testing of the discharge material is warranted.
- e. Aquatic Ecosystem and Organism Determinations
- 1) Effects on Plankton – Effect, if any, on plankton communities are expected to be insignificant and of short duration.
 - 2) Effects on Benthos – Benthic organisms may be disturbed with the turbidity increase, but no more than what would naturally occur during high flow events.
 - 3) Effects on Nekton – Nekton would be temporarily displaced during construction, but would return shortly after project completion.
 - 4) Effects on Aquatic Food Web – Temporary reductions in benthic and suspension/filter communities in such a small area should not significantly impact the aquatic food web during construction. These organisms would quickly recolonize the area after construction.
 - 5) Effects on Special Aquatic Sites
 - a) Sanctuaries and Refuges – not applicable.
 - b) Wetlands – No wetlands exist within the project area.
 - c) Mud Flats – not applicable.
 - d) Vegetated Shallows – not applicable.
 - e) Coral Reefs – not applicable.

- f) Riffle and Pool Complexes – not applicable.
- 6) Threatened and Endangered Species – The endangered Indiana bat and threatened northern long-eared bat would potentially utilize the forested habitat outside the project areas. No forested areas are located within the proposed project location. Site habitat assessments of the proposed project areas occurred during the winter of 2018. Results of the site assessment concluded that no evidence of suitable roost trees were present within the project location. Additionally, no evidence of bald eagles, or their nests, were observed at any project location. No federally threatened or endangered aquatic organisms, including freshwater mussels have been collected or observed in the Castor River-Headwater Diversion Ditch or in the vicinity of the project. Therefore, USACE has determined that the proposed project would have no effect on any threatened or endangered species nor their critical habitats. The U.S. Fish and Wildlife Service concurred with the no effect determination regarding federally listed threatened or endangered species on April 02, 2018.
- 7) Other Wildlife – Terrestrial wildlife would be minimally impacted during construction activities, but should return to pre-construction levels after construction is completed.
- 8) Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above, chiefly construction would occur in low-flow periods and impact areas would be limited to the extent necessary for construction.

f. Proposed Disposal Site Determinations

- 1) Mixing Zone Determinations – not applicable.
- 2) Determination of Compliance with Applicable Water Quality Standards – A state water quality certification is being requested from the State of Missouri, Department of Natural Resources as part of this application process.
- 3) Potential Effects on Human Use Characteristic
 - a) Municipal and Private Water Supply – not applicable.
 - b) Recreational and Commercial Fisheries – not applicable.
 - c) Water Related Recreation – not applicable.
 - d) Aesthetics – Any construction activities would have minimal impacts to the aesthetics of the area.
 - e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves – not applicable.

- g. Determination of Cumulative Effects on the Aquatic Ecosystem – With the stabilization of the stream banks, scouring would be reduced and could potentially reduce the amount of sediment entering the system. By armoring the RDB, the integrity of the adjacent levee would be ensured.
- h. Determination of Secondary Effects on the Aquatic Ecosystem – not applicable.

III. Findings of Compliance for Scour Control Measures

- a. Evaluation of Availability of Practical Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem

The original 1928 Environmental Impact Statement (EIS) and subsequent 1973 EIS has been previously completed that addresses alternatives to the proposed action. Furthermore the original EIS and amendments direct that the completed projects are to be maintained to insure the design degree of protection is retained. The recommended plan was determined to be the most cost effective and least environmentally damaging of the other alternatives studied in detail. The no action alternative was determined not to be practical. The proposed action would protect existing public infrastructure, and private homes and businesses. Without installation of scour control measures, the integrity of the levee would be compromised. Seepage could undermine the levee and cause it to breach during a flood event.

- b. Compliance with Applicable State Water Quality Standards

Application for State of Missouri water quality certification has occurred. A determination concerning water quality certification has not been made to date. Those making comments to this 404(b)(1) evaluation are asked to furnish a copy of their comments to the Missouri Department of Natural Resources.

- c. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 Of the Clean Air Act

Cape Girardeau and Bollinger Counties are in attainment for all air quality standards. No significant impacts to air quality are expected. The equipment to be used is a mobile source. Therefore, the project is exempt from air quality permitting requirements.

- d. Compliance with Endangered Species Act of 1973

No impacts are expected to federally listed or proposed threatened or endangered species. This project has been coordinated with the Department of Interior, U.S. Fish and Wildlife Service.

- e. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

Not applicable.

f. Evaluation of Extent of Degradation of the Waters of the United States

1) Significant Adverse Effects on Human Health and Welfare

- a) Municipal and Private Water Supplies – not applicable.
- b) Recreation and Commercial Fisheries – No significant impacts are expected.
- c) Plankton – No significant impacts are expected.
- d) Fish – No significant impacts are expected.
- e) Shellfish – not applicable.
- f) Wildlife – No significant impacts are expected.
- g) Special Aquatic Sites – not applicable.

2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems

No significant impacts are expected.

3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity, and Stability

No significant impacts are expected.

4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values

No significant impacts are expected. No clearing of woody vegetation would occur and construction activities would have minimal impacts to the aesthetics of the area. Vegetation would regenerate following construction.

g. Appropriate and Practical Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above, chiefly best management practices would be implemented, construction would occur during low-flow periods, and impact areas would be limited to the extent necessary for construction.

h. On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material is:

- 1) Specified as complying with the requirements of these guidelines; or,
- 2) Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

All conditions from the Missouri Department of Natural Resources would be adhered to.

- 3) Specified as failing to comply with the requirements of these guidelines.

May 18, 2018
Date



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Figure 1. Location of Proposed Scour Repairs, Cape Girardeau and Bollinger Counties, MO.

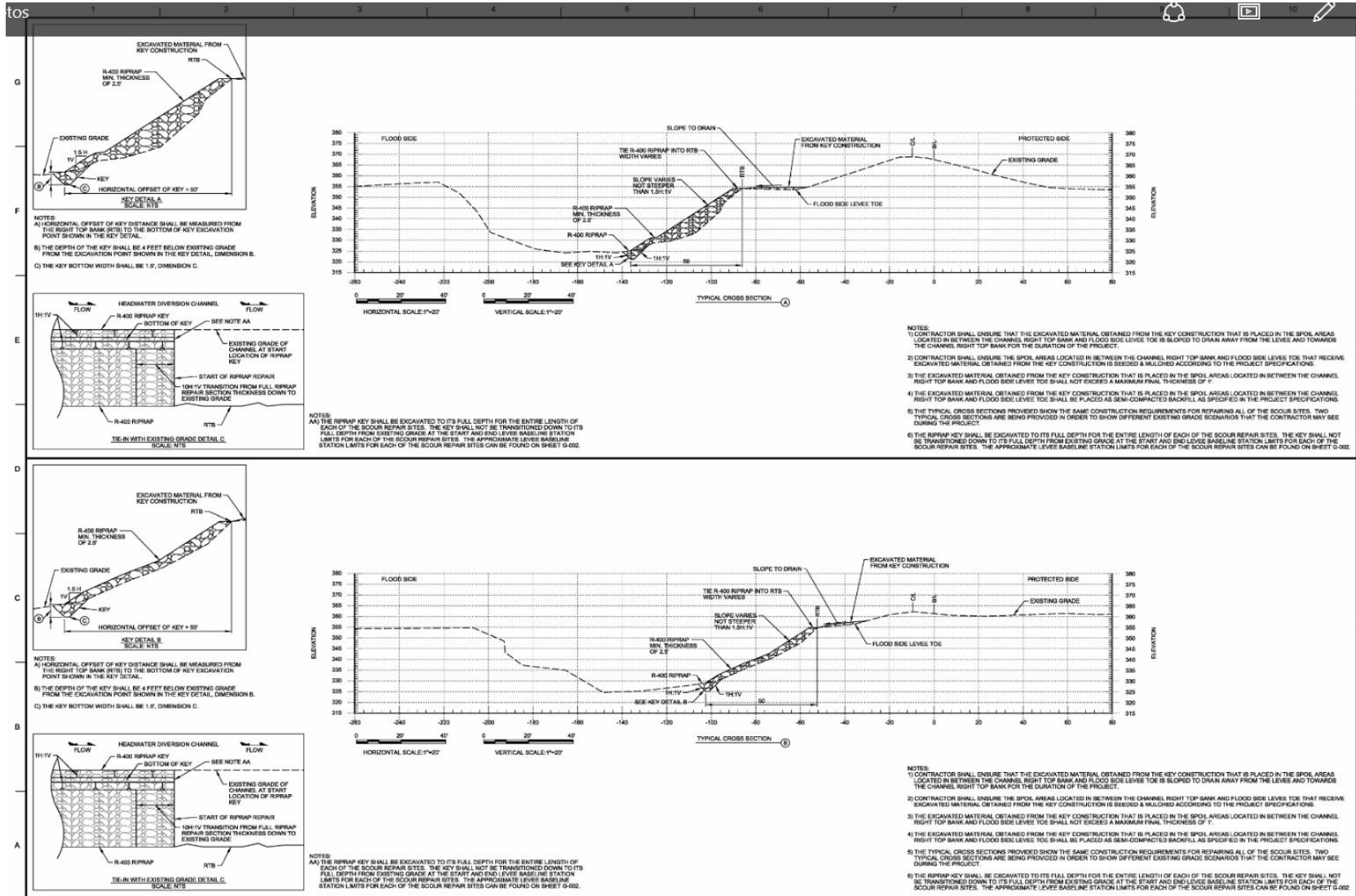


Figure 2. Typical proposed repair section.