

**DRAFT 404(b)(1) EVALUATION
St. Francis Basin Construction
Below Kennett/DD 48 Seepage Remediation
Dunklin County, Missouri**

I. Project Description

a. Location

The proposed seepage remediation measures are along the left descending bank (LDB) of the St. Francis River Levee, located near the town of Kennett in Dunklin County, Missouri (Figure 1). The proposed action is in the vicinity of levee baseline stations 19/18+00 and 28/00+00, and includes approximately eight miles of the existing St. Francis River, approximately from Missouri Highway 438 south along the existing levee to just south of Missouri Highway 513.

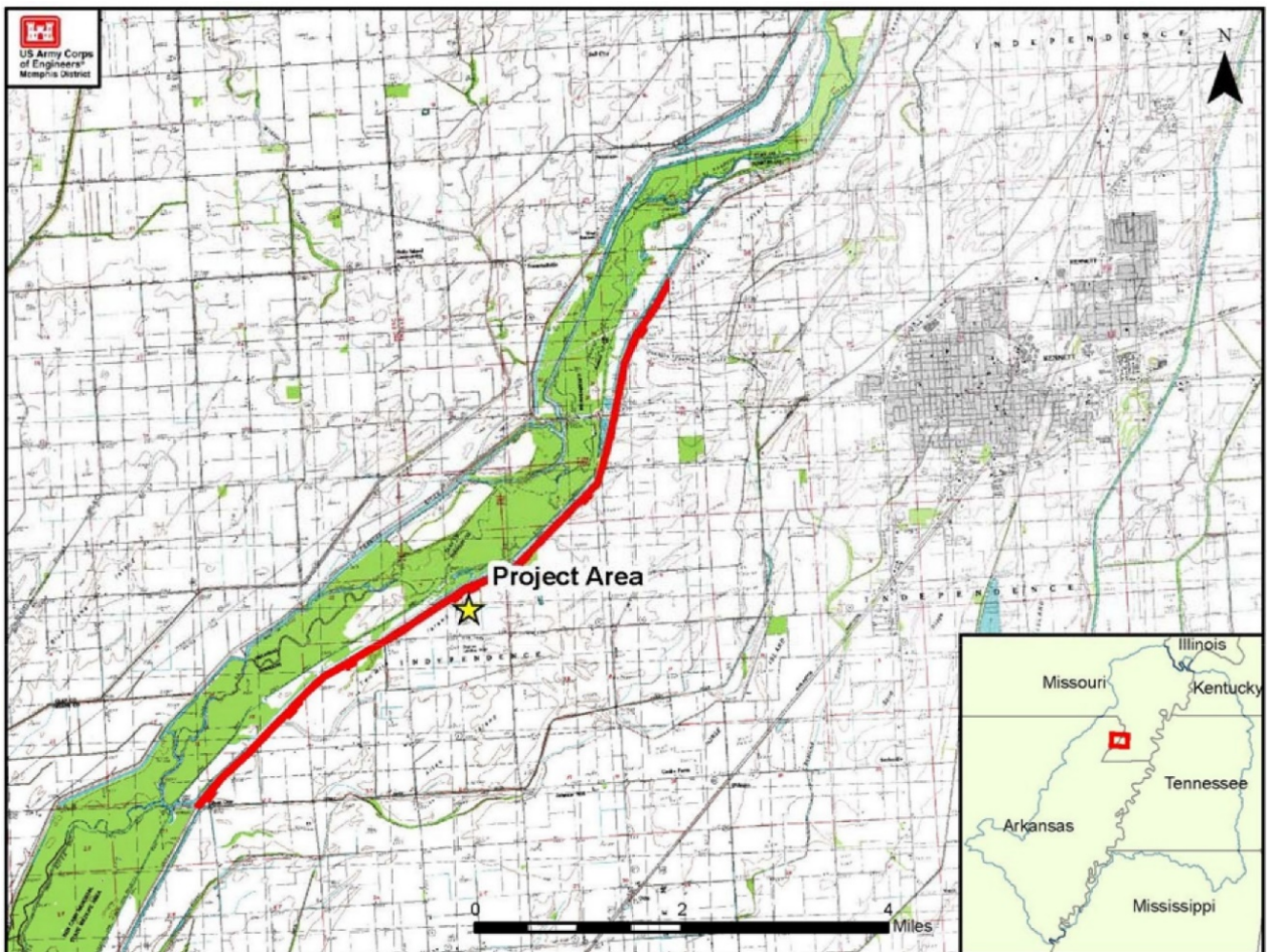


Figure 1. Figure 1. Location of Proposed Below Kennett/DD 48 Seepage Remediation Project, Dunklin County, MO.

b. General Description

- 1) The proposed work would consist of a 150-foot wide continuous, semi-pervious landside berm, constructed at the toe of the existing levee, except in several locations where wider berms (up to 300 feet wide) are required to reduce seepage issues (Table 1). The proposed project addresses both observed and potential excessive seepage and piping at both the landside levee toe and within a network of ditches running parallel to the landside levee toe during project flood conditions. Because of the close proximity of the levee to the problem areas, excessive seepage and piping have the potential to undermine and destabilize the riverside levee slope. The problem is ubiquitous throughout the study area and it was determined that individual fixes would not adequately address the scope of the problem.

Table 1. Approximate Berm Widths for the proposed Below Kennett/DD48 Seepage Project*.

Start Sta.	End Sta.	~ Length (ft)	Berm Width (ft)
20/26+50	20/31+50	500	300
21/28+50	21/33+50	500	195
22/10+50	22/15+50	500	300
22/55+50	23/00+50	493	200
23/25+50	23/30+50	500	300
23/30+50	23/35+50	500	180
23/35+50	23/40+50	500	260
24/7+50	24/12+50	500	165
24/12+50	24/17+50	500	195
24/42+50	24/47+50	500	300
25/24+50	25/29+50	500	245
25/29+50	25/34+50	500	300
26/36+50	26/41+50	500	300

* All other locations will have a 150-foot wide berm constructed.

The proposed project will be split into two phases, funding dependent. Phase I will begin just south of Highway 84, in the vicinity of Missouri State Highway 500 and continue south approximately 5.5 miles. Phase I will also be designed to receive runoff from north of Highway 84, in order to preserve current hydrology. Phase II will cover the remaining approximately 2.5 miles and would be designed and constructed at a later date. Therefore, precise project impacts for Phase II cannot currently be determined. However, anticipated impacts from preliminary findings are addressed in this document and are based on conservative estimates.

All berms would be approximately 5 feet in thickness at the levee toe, sloping to approximately 2.5 feet at the berm toe (Figure 2). Multiple drainage ditches

running parallel to the landside toe would be filled and interior drainage would be re-oriented away from the levee through a combination of existing/new ditch work and re-grading fields adjacent to the levee. Approximately 10 miles of lateral ditches and 254 acres of land adjacent to the proposed berm toe will re-direct run-off from the levee and towards the Varney River (Figure 3). All ditches would have R-200 riprap placed 5 feet upstream and 10 feet downstream of any culverts. All riprap would be placed in 2-foot thickness and extend continuously from one side slope to the other side slope. These proposed improvements are listed below:

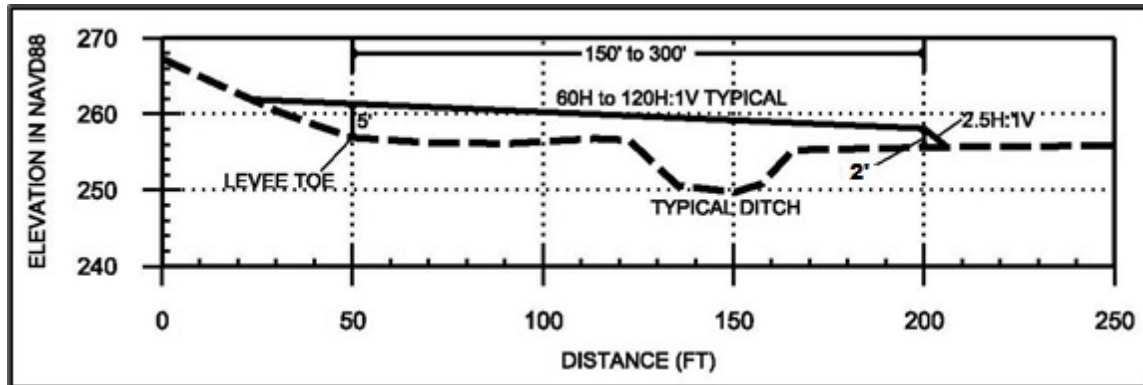


Figure 2. Typical proposed landside berm for the Proposed Below Kennett/DD 48 Seepage Remediation Project, Dunklin County, MO.

Ditch 1

Ditch 1 is approximately 6,500 feet in length and runs through a Natural Resources Conservation Service (NRCS) Wetlands Reserve Program (WRP) easement. All work will be coordinated with the NRCS prior to project construction. As this portion of ditch is in Phase II, no final design, NRCS concurrence, or compensatory mitigation have been completed or determined at this time. Therefore, preliminary design work was used to estimate impacts for the associated environmental assessment (EA). The EA will be amended as appropriate and an additional public notice will be published.

Ditch 1 would have three 24-inch diameter weir and culvert combinations near the middle portion of the ditch, two 36-inch corrugated metal pipe (CMP) culverts under County Road 401, and two 42-inch CMPs and flap gates at the confluence of Ditch 1 and Varney River. Additionally, at the confluence of Ditch 1 and Varney River, a 2-foot thick, 17 foot by 24 foot riprap apron would be installed to dissipate outflow energy and to protect against downstream erosion. The weir/culvert combination will replace an existing 36-inch steel pipe culvert and will be used to control minimum pool elevations for the WRP.

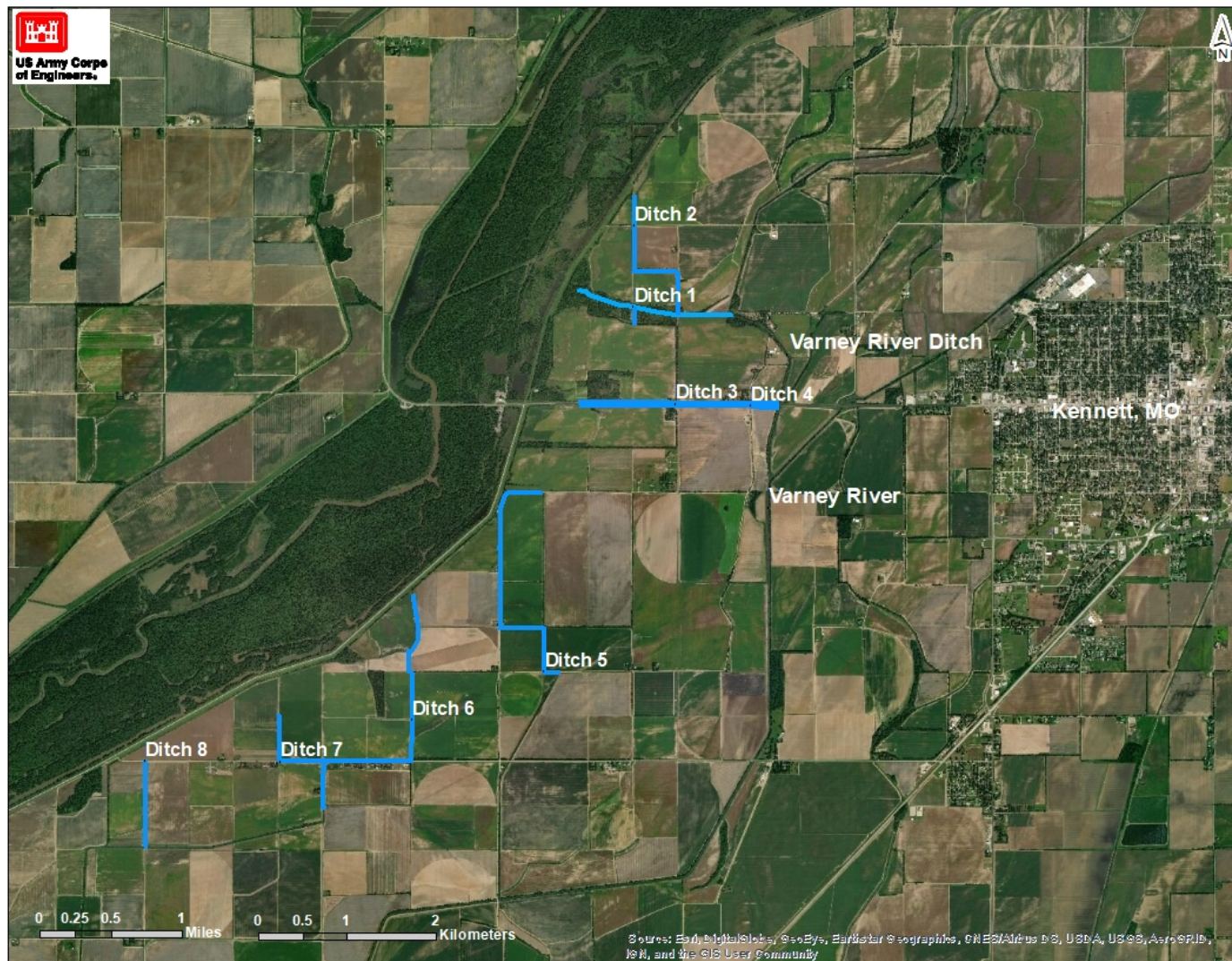


Figure 3. Proposed ditch work for the Proposed Below Kennett/DD 48 Seepage Remediation Project, Dunklin County, MO.

Ditch 2

Ditch 2 is approximately 4,500 feet in length. This ditch proceeds east along the existing ditch alignment (Dunklin County Cutoff) and eventually crosses under County Road 401 before emptying into the Varney River. Similar to Ditch 1, project designs have not yet been finalized for Ditch 2; and therefore, preliminary design work, including two potential culverts, was used to estimate impacts for this analysis and the associated EA.

Ditch 3

Ditch 3 is approximately 4,300 feet in length. The ditch starts south of and runs under Highway 84 through two 30-inch diameter culverts. The proposed ditch modification runs northwest along the existing ditch alignment and would eventually empty into Ditch 1 within the WRP land. Similar to Ditch 1, project designs have not yet been finalized for Ditch 2; and therefore, preliminary design work, including two potential culverts, was used to estimate impacts for this analysis and the associated EA.

Highway 84 Culverts

A double barrel 30-inch reinforced concrete pipe (RCP) is proposed to carry drainage north from the field immediately adjacent to Highway 84. This would replace the existing 5 by 4 foot concrete box culvert. Similar to Ditch 1, project designs have not yet been finalized for Ditch 2; and therefore, preliminary design work was used to estimate impacts for this analysis and the associated EA.

Ditch 4

Ditch 4 is approximately 14,650 feet in length. This ditch begins south of the field adjacent to Highway 84. The constructed ditch would follow existing ditch alignment and have a bottom width of between 4-5 feet and be sloped at 2.5H:1V. Approximately the first 4,000 feet would be widened to 5-feet before transitioning to existing bottom width. Two current 24-inch CMP culverts would be removed, one 24-inch CMP and one 36-inch CMP would be installed, and one 36-inch CMP would be replaced.

Ditch 5

Ditch 5 is approximately 12,000 feet in length. This ditch begins at the proposed berm toe following existing drainage and would be constructed in a similar fashion as Ditch 4. Two 48-inch CMPs, one 36-inch CMP, and one 30-inch CMP are proposed to be installed, one 24-inch CMP would be removed, and two 18-inch CMPs, one 54-inch CMP, and one 60-inch CMP would be replaced.

Ditch 6

Ditch 6 is approximately 14,650 feet in length. This ditch begins west of Ditch 5 and follows existing drainage until it terminates into Ditch 5. The main section of this ditch would consist of a “V” channel transitioning to a 4-foot wide channel bottom. This ditch would also be sloped 2.5H:1V. No culverts are proposed for this ditch.

Ditch 7

Ditch 7 is approximately 3,300 feet in length and would be constructed to have a 4-foot bottom width and side slopes of 2.5H:1V. This ditch is west of Ditch 6 and would follow existing drainage at the edge of an agricultural field towards an existing ditch. No culverts are proposed for this ditch.

Ditch 8

Ditch 8 is approximately 6,600 feet in length and would be constructed to have a 4-foot bottom width transitioning to a 15-foot bottom width and be sloped 2.5H:1V. This ditch is west of Ditch 7 and would also follow existing drainage before terminating into the same collector ditch as Ditch 7, but further downstream of that confluence. No culverts are proposed for this ditch.

Field Grading

As much of the runoff from landside agricultural fields adjacent to the levee is currently directed towards multiple collector ditches running parallel to the levee toe, approximately 254 acres on 8 landside agricultural fields would be graded to re-direct surface water away from the proposed berm toe and towards the ditches described above. These agricultural fields are currently leveled and sloped to drain towards the collector ditches at the levee toe. The field grading proposed would re-slope and re-level the agricultural fields to re-direct drainage towards the various collector ditches proposed.

Borrow would be obtained from previously cleared fields within the project vicinity or from contractor furnished borrow locations. If contractor furnished borrow is utilized for the project, all appropriate environmental compliance standards (*i.e.*, cultural surveys, endangered species clearances, water quality compliance, wetland jurisdictional surveys, and/or mitigation) would be met.

Access to the project areas would be via State/County and levee roads. It is anticipated that no utilities would be disturbed as part of the proposed work for Phase I, but would be required for Phase II and be coordinated with the appropriate agencies and entities prior to construction.

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, and 13 August 1968. Local cooperation requirements were modified by the Flood Control Act of July 24, 1946, and limited local responsibility to ordinary maintenance as defined by Section 3 of the Flood Control Act of 1928. The project site is covered by the 1964 USACE General Design Memorandum 104.

d. General Description of Dredged or Fill Material

1) General Characteristics of Material

Riprap – All ditches would have R-200 riprap placed 5 feet upstream and 10 feet downstream of any culverts. All riprap would be placed in 2-foot thickness and extend continuously from one side slope to the other side slope.

Backfill –Excavated material from borrow location(s) would be placed in a 150-foot wide continuous, semi-pervious landside berm, except in locations where wider berms (up to 300 feet wide) would be required. All berms would be approximately 5 feet in thickness at the levee toe, sloping to approximately 2.5 feet at the berm toe. Approximately 800,000 cubic yards of material would be required.

2) Quantity of Material

Riprap – Approximately 900 tons of R-200 riprap would be needed for the estimated 24 culvert, weirs, or reinforced pipe locations.

Backfill – Approximately 800,000 cubic yards would be required for project construction.

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 an appropriate borrow area.

e. Description of the Proposed Discharge Site(s)

1) Location – The project area is in Dunklin County, Missouri and would drain via existing ditches towards the Varney River. All work will be conducted landside of the St. Francis River, a permanent waterbody.

2) Size – The St. Francis East to Big Lake West System Levee provides flood protection to the area below Kennett, Missouri. Approximately 2,500 acres drain into the existing landside drainage ditch which is proposed to be filled in with flow re-routed into the Varney River. The Varney River is the principal left bank tributary to the St. Francis River. The Varney River drains approximately 43 square miles of primarily agricultural lands. Ditch lengths and sizes vary and have been previously described in this document.

- 3) Type(s) of Habitat – Available in-stream habitat is sparse throughout the project area as there are few trees along the existing ditches to provide any allochthonous input (*i.e.*, organic matter that a stream receives from outside the stream channel). The ditch sediment load consists of agricultural and rain run-off and very little stable habitat. The immediate riparian zone is dominated by grasses, weed species, and agricultural lands with no trees or shrubs. There are some woody vegetated areas along the existing levee toe that would be removed during berm construction. Outside the immediate vicinity of the ditches, the surrounding area is dominated by land in row crop production.
- 4) Timing and Duration of Discharge – Construction is scheduled to commence on Phase I 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

Approximately 130 cubic yards would be excavated during ditch work and approximately 27 acres of vegetation would be cleared along the levee toe to allow for berm construction and equipment access for all phases of construction. Minimal amounts of excavation of the ditch channel bottom would be necessary to create the suitable slope and drainage flows required during 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 2.5H:1V would be created to re-route drainage away from the levee toe. R-200 riprap would be utilized at culvert locations.
- 2) Sediment Type – Sediment is composed exclusively of Malden –Brosley-Bosket in the approximate two-thirds northern portion of the proposed project with the remaining soil type being Sharkey Lilbourn-Gideon. 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.
- 3) Dredged/Fill Material Movement – Material would be excavated from the proposed borrow area and deposited adjacent to the levee to create the appropriate berm section along the levee toe.
- 4) Physical Effects on Benthos – Excavation of sediment to replace culverts would have a minimal impact on benthos. Benthic communities would return to pre-existing conditions shortly after project completion. Benthic communities in the existing toe ditches would be negatively impacted by the filling in of the toe ditches but would be expected to re-colonize the created drainage ditches.

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.
- 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. However, a slight increase in water quality may occur due to buffer strips that will be planted alongside ditch right-of-ways.
- 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. There may be a slight decrease in eutrophication due to buffer strips that will be planted alongside ditch right-of-ways.
- j) Others - not applicable.

2) Current Patterns and Circulation

- a) Current Patterns and Flow – Current patterns and flows are not expected to be altered. Post-construction drainage will be similar to pre-existing conditions except for flow will be directed away from the levee instead of flowing along the levee toe before entering downstream drainage ditches.
- 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. Post-construction hydrology of the project area will be similar to pre-existing conditions.

3) Normal Water Level Fluctuations – The existing water levels in the ditches are determined by rainfall and channel capacity. Some enlargement of existing ditches and is mentioned previously in this document with the storage capacity within the ditches 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.
 - b) Dissolved Oxygen – No change is expected due to the shallow water depth and minimal 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.

 - e) Others as Appropriate – None noted.
- 3) Effects on Biota
 - a) Primary Production – Aquatic vegetation is limited within the existing ditches. 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 – Most of the ditches are ephemeral in nature and do not sustain native populations of fishes. However, resident fish present 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 – There is an expected negative impact on benthic organisms from the filled in ditch, but these organisms are expected to re-populate the newly constructed stream with no overall impact expected to the benthic community.
- 3) Effects on Nekton – Nekton would be temporarily displaced during construction, but would return shortly after project completion. These organisms would expect similar impacts as those indicated for the benthic organisms.
- 4) Effects on Aquatic Food Web – Temporary reductions in benthic and suspension/filter communities 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 – Approximately 27 acres of wetlands would be impacted by berm construction. At a minimum, a 3:1 ratio (81 acres) will be used to offset impacts. Prior converted, non-wet agricultural land would be restored to bottomland hardwoods or a comparable forested wetland. Target areas for concurrent mitigation would focus on agricultural lands adjacent or near to existing conservation areas within the St. Francis Basin. Prior to any lands purchased for mitigation, approval by an Interagency team composed of members from Missouri and federal resource agencies would be reached. A mitigation plan would be developed by the Interagency team for the approved mitigation tract(s).
 - 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 adjacent to the project area. Site assessments of the proposed project area were performed

during the summer/fall of 2018 and 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 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 November 30, 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 – Ben Cash Memorial Conservation Area is located just to the south of the proposed project. No work is proposed for this area and no project related impacts to this conservation area is expected.

- g. Determination of Cumulative Effects on the Aquatic Ecosystem – With the stabilization of the stream banks, construction of a landside berm, and re-routing of drainage seepage and piping would be reduced and could potentially reduce the

amount of sediment entering the system. By creation of the landside berm, 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 Seepage 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 EIS and amendments direct that the completed projects are to be maintained to ensure the designed degree of protection. 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 seepage 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 is being requested as part of the 404 analysis. 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

Dunklin County is 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. 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.

June 4, 2019
Date


Kevin R. Pigott
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