

Report to Congress for Future Water Resources Development (WRRDA 7001) Submission Package

Proposal Name: Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study

Submission Date: 08/27/2019

Proposal ID Number: bc5e3bee-29f0-45ef-992b-c46a0cb352f7

Purpose of Proposal: Tuttle Creek Lake is the largest reservoir in the Kansas River Basin and possesses more flood control, water supply, and navigation support storage than the other six reservoirs in the basin combined. Since dam closure 438 million cu-yards of sediment have accumulated, displacing 62,000 ac-ft of storage for flood control and 209,000 ac-ft of storage for navigation support, water supply, and other uses. Estimates indicate that by 2071, the multi-purpose pool will be 93% full of sediment, leaving only 7% of the original storage capacity. The full reservoir up to the top of the flood control pool will be 22% full of sediment, or reduced to 78% of the original capacity. The KWO proposes to partner with USACE to prepare a feasibility study to evaluate alternatives to promote sustainable long-term reservoir sediment management. The proposed project provides the funding necessary to perform a feasibility study to analyze alternatives to create a long-term recommended plan. The recommended plan may include up front capital costs as well as repeated sediment management operations to be performed annually or continuously. Work to-date has indicated three technologies have the greatest potential application at Tuttle Creek Lake: Water Injection Dredging, hydrosuction, and hydraulic dredging with recharge of the sediment to the downstream channel. This study will include analysis of these technologies to create a recommended plan, including costs, NED benefits, dam safety evaluations, and NEPA. Preliminary analyses have suggested that an optimum solution may require a combination of these technologies. The study authority (Section 216 of the Flood Control Act of 1970) authorizes the Secretary of the Army to review the operation of completed projects that were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significantly changed physical or economic conditions.

1. Administrative Details

Proposal Name: Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study

by Agency: Kansas Water Office

Locations: KS

POC Name:

POC Phone:

POC Email:

Date Submitted: 08/27/2019

Confirmation Number: bc5e3bee-29f0-45ef-992b-c46a0cb352f7

Supporting Documents

File Name	Date Uploaded
7001-FS-KWO-Letter-of-Support.pdf	08/27/2019
Tuttle-FS-7001-Map.pdf	08/27/2019
7001-Tuttle-FS-Letters-of-Support.pdf	08/27/2019

2. Provide the name of the primary sponsor and all non-Federal interests that have contributed or are expected to contribute toward the non-Federal share of the proposed feasibility study or modification.

Sponsor	Letter of Support
Kansas Water Office(Primary)	The Kansas Water Office (KWO) was established in 1981 as the water planning, policy, coordination and marketing agency for the State of Kansas. The primary function of the KWO is the development and implementation of the Kansas Water Plan. The State Water Plan lists ensuring a reliable water supply for each citizen, securing, protecting, and restoring Kansas reservoirs, and reducing vulnerability to extreme events as guiding principles. In addition, the KWO administers the state's Water Marketing and Water Assurance programs which provide water supply from the storage owned within thirteen of Kansas' federal reservoirs, including Tuttle Creek Lake. As a critical source of flood and water supply storage for the Kansas River Basin, addressing sedimentation issues at Tuttle Creek Lake is of the utmost importance to the people of Kansas and the goals of the KWO. The KWO eagerly offers its support and financial resources for this Sediment Management and Reservoir Sustainability Feasibility Study.

3. State if this proposal is for new feasibility study authority, a modification to an existing feasibility study authority, a modification to an existing USACE project authority, or a modification to an existing USACE Environmental Infrastructure Program authority. If it is a proposal for a modification to an existing study, project or program authority, provide the authorized water resources development feasibility study or project name.

New Feasibility Study Authority

4. Clearly articulate the specific project purpose(s) of the proposed study or modification. Demonstrate that the proposal is related to USACE mission and authorities and specifically address why additional or new authorization is needed.

Tuttle Creek Lake is the largest reservoir in the Kansas River Basin and possesses more flood control, water supply, and navigation support storage than the other six reservoirs in the basin combined. Since dam closure 438 million cu-yards of sediment have accumulated, displacing 62,000 ac-ft of storage for flood control and 209,000 ac-ft of storage for navigation support, water supply, and other uses. Estimates indicate that by 2071, the multi-purpose pool will be 93% full of sediment, leaving only 7% of the original storage capacity. The full reservoir up to the top of the flood control pool will be 22% full of sediment, or reduced to 78% of the original capacity. The KWO proposes to partner with USACE to prepare a feasibility study to evaluate alternatives to promote sustainable long-term reservoir sediment management. The proposed project provides the funding necessary to perform a feasibility study to analyze alternatives to create a long-term recommended plan. The recommended plan may include up front capital costs as well as repeated sediment management operations to be performed annually or continuously. Work to-date has indicated three technologies have the greatest potential application at Tuttle Creek Lake: Water Injection Dredging, hydro suction, and hydraulic dredging with recharge of the sediment to the downstream channel. This study will include analysis of these technologies to create a recommended plan, including costs, NED benefits, dam safety evaluations, and NEPA. Preliminary analyses have suggested that an optimum solution may require a combination of these technologies. The study authority (Section 216 of the Flood Control Act of 1970) authorizes the Secretary of the Army to review the operation of completed projects that were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significantly changed physical or economic conditions.

5. To the extent practicable, provide an estimate of the total cost, and the Federal and non-Federal share of those costs, of the proposed study and, separately, an estimate of the cost of construction or modification.

	Federal	Non-Federal	Total
Study	\$1,500,000	\$1,500,000	\$3,000,000
Construction	\$0	\$0	\$0

Explanation (if necessary)

6. To the extent practicable, describe the anticipated monetary and nonmonetary benefits of the proposal including benefits to the protection of human life and property; improvement to transportation; the national economy; the environment; or the national security interests of the United States.

This project supports sustainability of storage for meeting the purposes of flood risk management in the Kansas River Basin. Tuttle Creek Lake has prevented over \$12.4 billion in damages over the life of the reservoir. The \$213.7 million in annual damages prevented by Tuttle Creek Lake is equal to 31.6% of the Corps of Engineers and Bureau of Reclamation projects average annual damages prevented of \$676.6 million. Based on the current information in hand, it is difficult to assign a monetary value to the environmental and socio-economic benefits of this proposed project. Non-monetary benefits of the project included the many benefits of increased storage capacity and available water resources such as maintenance of water supply needed for municipal, industrial, and recreational users, as well as navigation releases. It also provides enhanced drought resiliency, improved water quality and quantity downstream during drought periods, and the ability to help preserve the fisheries and aquatic wildlife downstream by releasing water for longer periods. Additionally, the release of higher-turbidity water during normal to high flow conditions is anticipated to aid in the restoration of historic fish species below Tuttle Creek Dam, including the pallid sturgeon, a threatened and endangered species.

7. Does local support exist? If 'Yes', describe the local support for the proposal.

Yes

Local Support Description

Tuttle Creek Lake is a major water source (up to 50% of the flow) for the Kansas River, which supplies public drinking water for the urban populations of Kansas City, Topeka and Lawrence. Water stored in Tuttle Creek Lake is provided through a contract with the KWO to the Kansas River Water Assurance District (KRWAD), which includes multiple municipal and industrial water users. Surface water demand on the main stem of the Kansas River is expected to continue to increase significantly in the future, which makes the ability to store water in reservoirs and maintain future supply through the proposed alteration in the public interest. As part of the development of the Long-Term Vision for the Future of Water in Kansas, fourteen regional planning areas were established in Kansas, along with a representative Regional Advisory Committee (RAC). The Kansas RAC, which represents the Kansas River Basin, has members that represent water supply, recreation, conservation, industry, and agriculture interests. The Kansas RAC has a goal for the KWO "to incorporate existing studies and information to study the possibility of future dredging and other measures by the State of Kansas on a more consistent basis to maintain storage". Furthermore, the feasibility study would utilize resources from the Kansas River Reservoirs Flood and Sediment Study, the Sustainable Rivers Program, a proposed Water Injection Dredging Demonstration Project, and advance many of the same project goals. Those efforts have a variety of formal supporters, including the governor, legislators, state agencies, conservation organizations, industrial users, as well as the Department of the Army (Fort Riley, Kansas). This demonstrates a collective and intense interest in the Kansas River Basin and efforts for sustaining water storage capacity at federal reservoirs.

8. Does the primary sponsor named in (2.) above have the financial ability to provide for the required cost share?

Yes

Primary Sponsor Letter of Support

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7001_FS_KWO_Letter_of_Support.pdf



August 27, 2019

U.S. Army Corps of Engineers, Kansas City District
601 E. 12th Street
Kansas City, MO 64106-2896

Subject: Support for the "Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study" WRRDA 7001 Proposal

The Kansas Water Office (KWO) supports the Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study to evaluate sediment management alternatives for Tuttle Creek Lake to promote sustainable reservoir sediment management and create a long-term recommended plan. The KWO supports the proposed project based on the value of the various authorized purposes that Tuttle Creek Lake provides to the Kansas River basin, including water supply, flood control, water quality, recreation, navigation, and fish/wildlife objectives. All of these benefits are threatened by the current rate of sedimentation at Tuttle Creek Lake.

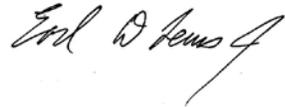
Tuttle Creek Lake is the primary water source for the Kansas River, providing the majority of flow to meet targets and more than half of the flood storage. However, recent estimates from the Kansas Water Office indicate that approximately 48% of the reservoir's original storage capacity has been lost due to sedimentation since beginning operation in 1962. The continued loss of capacity and resulting impact to the authorized purposes is a major concern for the State of Kansas, particularly given the potential cost to address the situation. The average sediment accumulation rate in Tuttle Creek Lake is approximately 5.8 million cubic yards per year. Assuming the cost of conventional dredging is \$6.67 per cubic yard, based on the cost of previous dredging efforts by the State at John Redmond Reservoir in Kansas, this equates to a cost of \$38.7 million per year. A thorough evaluation of the current sediment management technologies with the greatest potential for implementation at Tuttle Creek Lake (WID, hydrosuction, and hydraulic dredging with recharge of the sediment to the downstream channel) could provide critically important insight for developing a long-term reservoir sediment management plan that is much more cost-effective and sustainable.

Furthermore, there is a collective and intense interest in the Kansas River Basin and efforts for sustaining water storage capacity at federal reservoirs. Current efforts such as the Kansas River Reservoirs Flood and Sediment Study and the Sustainable Rivers Program (SRP), as well as the recently proposed Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project WRRDA 7001 proposal, which the proposed feasibility study would utilize resources from and support many of the same project goals, have had a variety of formal supporters, including governors, legislators, state agencies, conservation organizations, industrial users, as well as the Department of the Army (Fort Riley, Kansas). This shows a present commitment in Kansas to

address reservoir sedimentation issues, making it an ideal time to partner with the State and build on the current momentum.

With all of this in mind, the KWO supports the WRRDA 7001 proposal for the Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study and looks forward to the prospect of future water planning discussions.

Sincerely,

A handwritten signature in black ink, appearing to read "Earl Lewis". The signature is written in a cursive style with a long, sweeping tail on the final letter.

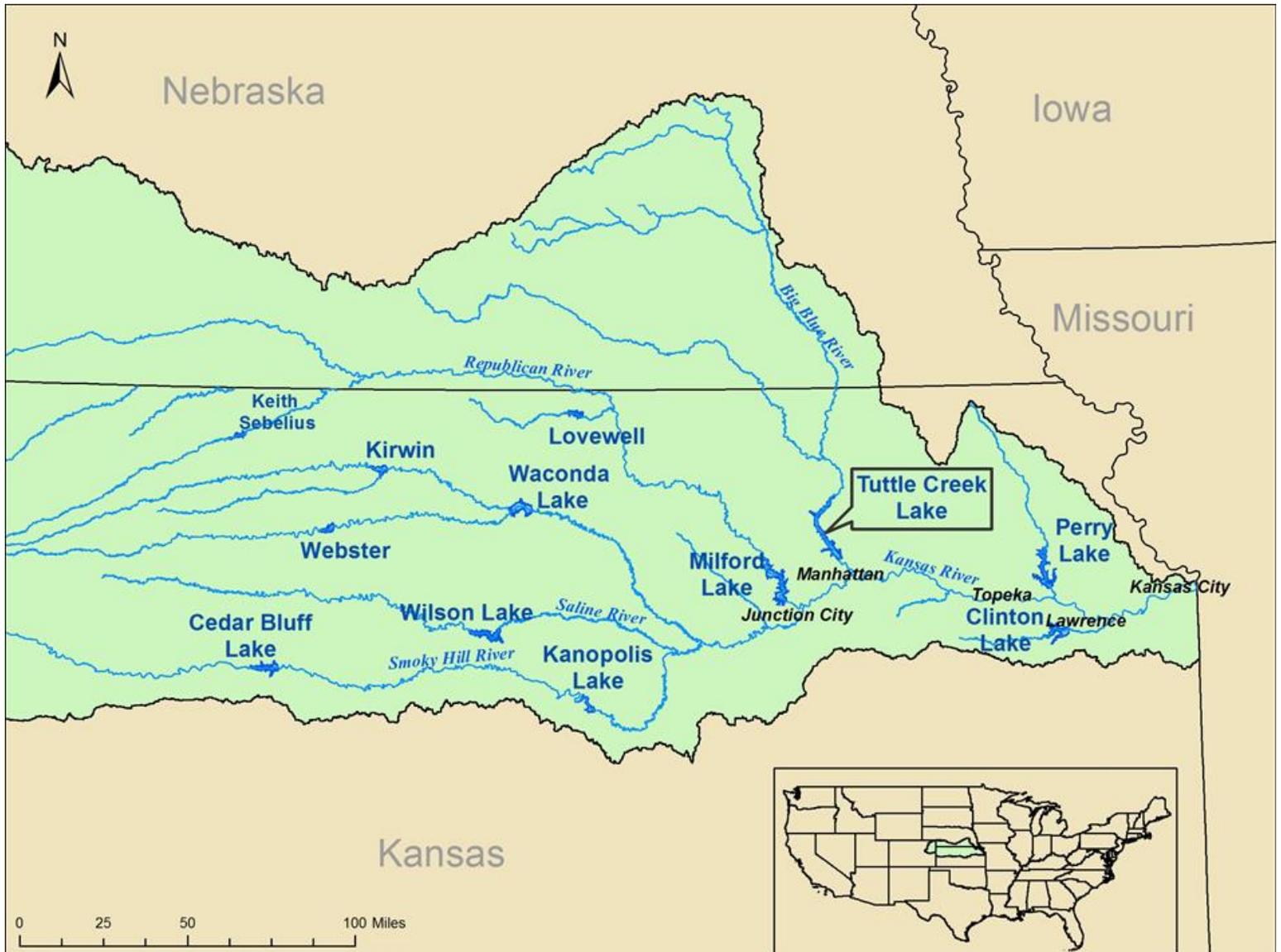
Earl Lewis, Acting Director
Kansas Water Office

Map Document

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Tuttle_FS_7001_Map.pdf

Study Area – Tuttle Creek Lake in the Kansas River Basin



Additional Proposal Information

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7001__Tuttle_FS_Letters_of_Support.pdf

The Kansas River



Water Assurance District No. 1

212 SW 7th Street - Topeka, Kansas 66603-3717

August 26, 2019

U.S. Army Corps of Engineers, Kansas City District
601 E. 12th Street
Kansas City, MO 64106-2896

Subject: Support for the "Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study" WRRDA 7001 Proposal

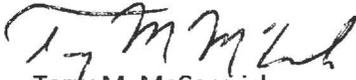
This letter is written to express support for the Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study to evaluate sediment management alternatives for Tuttle Creek Lake to promote sustainable reservoir sediment management and create a long-term recommended plan. We support the proposed project based on the value of the various authorized purposes that Tuttle Creek Lake provides to the Kansas River basin, including water supply, flood control, water quality, recreation, navigation, and fish/wildlife objectives. All of these benefits are threatened by the current rate of sedimentation at Tuttle Creek Lake.

Tuttle Creek Lake is the primary water source for the Kansas River, providing the majority of flow to meet targets and more than half of the flood storage. However, recent estimates from the Kansas Water Office indicate that approximately 48% of the reservoir's original storage capacity has been lost due to sedimentation since beginning operation in 1962. The continued loss of capacity and resulting impact to the authorized purposes is a major concern for the State of Kansas, particularly given the potential cost to address the situation. The average sediment accumulation rate in Tuttle Creek Lake is approximately 5.8 million cubic yards per year. Assuming the cost of conventional dredging is \$6.67 per cubic yard, based on the cost of previous dredging efforts by the State at John Redmond Reservoir in Kansas, this equates to a cost of \$38.7 million per year. A thorough evaluation of the current sediment management technologies with the greatest potential for implementation at Tuttle Creek Lake (WID, hydrosuction, and hydraulic dredging with recharge of the sediment to the downstream channel) could provide critically important insight for developing a long-term reservoir sediment management plan that is much more cost-effective and sustainable.

Furthermore, there is a collective and intense interest in the Kansas River Basin and efforts for sustaining water storage capacity at federal reservoirs. Current efforts such as the Kansas River Reservoirs Flood and Sediment Study and the Sustainable Rivers Program (SRP), as well as the recently proposed Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project WRRDA 7001

proposal, which the proposed feasibility study would utilize resources from and support many of the same project goals, have had a variety of formal supporters, including governors, legislators, state agencies, conservation organizations, industrial users, as well as the Department of the Army (Fort Riley, Kansas). This shows a present commitment in Kansas to address reservoir sedimentation issues, making it an ideal time to partner with the State and build on the current momentum.

The Kansas River Water Assurance District supports the Kansas Water Office's WRRDA 7001 proposal for the Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study and look forward to the prospect of future water planning discussions.

A handwritten signature in black ink, appearing to read 'Terry M. McCormick', written in a cursive style.

Terry M. McCormick

President

Kansas River Water Assurance District No. 1



Administrative Offices
10747 Renner Boulevard
Lenexa, KS 66219

913.895.5500
www.waterone.org

August 26, 2019
U.S. Army Corps of Engineers, Kansas City District
601 E. 12th Street
Kansas City, MO 64106-2896

Subject: Support for the "Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study" WRRDA 7001 Proposal

I am writing on behalf of WaterOne to express support for the Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study to evaluate sediment management alternatives for Tuttle Creek Lake and create a long-term recommended plan. Tuttle Creek serves many important purposes in the Kansas River basin, including water supply, flood control, water quality, recreation, navigation, and fish/wildlife objectives. All of these benefits are threatened by the current rate of sedimentation at Tuttle Creek Lake.

Tuttle Creek Lake is the primary water source for the Kansas River, providing the majority of flow to meet targets and more than half of the flood storage. However, recent estimates from the Kansas Water Office indicate that approximately 48% of the reservoir's original storage capacity has been lost due to sedimentation since beginning operation in 1962. The continued loss of capacity and resulting impact to the authorized purposes is a major concern for the State of Kansas, particularly given the potential cost to address the situation. The average sediment accumulation rate in Tuttle Creek Lake is approximately 5.8 million cubic yards per year. Assuming the cost of conventional dredging is \$6.67 per cubic yard, based on the cost of previous dredging efforts by the State at John Redmond Reservoir in Kansas, this equates to a cost of \$38.7 million per year. A thorough evaluation of the current sediment management technologies with the greatest potential for implementation at Tuttle Creek Lake (WID, hydrosuction, and hydraulic dredging with recharge of the sediment to the downstream channel) could provide critically important insight for developing a long-term reservoir sediment management plan that is much more cost-effective and sustainable.

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With all of this in mind, WaterOne supports the Kansas Water Office's WRRDA 7001 proposal for the Tuttle Creek Lake Sediment Management and Reservoir Sustainability Feasibility Study and look forward to the prospect of future water planning discussions.

Sincerely,

A handwritten signature in black ink that reads "D Meese".

Darci Meese
Manger, Legal Services/Government Affairs
Office: 913/895-5516
dmeese@waterone.org