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

Proposal Name: Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project

Submission Date: 08/27/2019

Proposal ID Number: 9cd22d6b-78bc-47b0-ab4a-9da050916c4e

Purpose of Proposal: The purpose of this project is to sustain long-term use of Tuttle Creek Lake for its au thorized purposes, including flood control, water supply, water quality, recreation, navigation, and fish_wil dlife objectives. The KWO previously submitted a proposal under the WRDA 2016-Section 1122-Beneficial Use of Dredged Material Pilot Projects that was not selected. This proposal is a continued effort to seek au thority to add an additional project under Section 1122 for a specific project, the Tuttle Creek Lake WID Demonstration Project. Since dam closure at Tuttle Creek Lake, 438 million cubic yards of sediment h ave accumulated, displacing 62,000 acre-feet of storage for flood control and 209,000 acre-feet of storage for navigation support, water supply, and other uses. Early estimates indicate that by 2071, the multi-purpose pool will be 93% full of sediment, and the full reservoir up to the top of the flood control pool will be 22% f ull of sediment. In addition, Tuttle Creek Lake has been releasing unnaturally clear water downstream, ind ucing as much as 14 feet of degradation on the Big Blue River and leading to loss of turbidity-dependent a quatic species in the Kansas River. The KWO proposes to partner with USACE to implement a WID f ield demonstration project at Tuttle Creek Lake to promote sustainable long-term reservoir sediment mana gement. Preliminary site assessments, sediment chemistry, and physical properties analysis conducted by t he KWO, NWK, and ERDC indicate that Tuttle Creek Lake would be an ideal location to test WID tech nology. This project will meet the recommendation by the Environmental Advisory Board that the Corps implement reservoir sediment sustainability pilot projects that demonstrate different management options. This can also be used to further satisfy the requirement in 2016 WRDA for reservoir sediment management pilot projects. Successful implementation of WID at Tuttle Creek Lake would serve as an example for othe r federal reservoirs.

1. Administrative Details

Proposal Name: Tuttle Creek Lake Water Injection Dredging (W ID) Demonstration Project

by Agency: Kansas Water Office

Locations: KS

POC Name:

POC Phone:

POC Email:

Date Submitted: 08/27/2019

Confirmation N umber: 9cd22d6b-78bc-47b0-ab4a-9da050916c4e

Supporting Documents

File Name	Date Uploaded
7001-WID-KWO-Letter-of-Support.pdf	08/27/2019
Tuttle-WID-7001-Map.pdf	08/27/2019
7001-WID-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 t he KWO is the development and implementation of the K ansas Water Plan. The State Water Plan lists ensuring a reliable water supply for each citizen, securing, protecting, and restoring Kansas reservoirs, and reducing vulnerabilit y 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 floo d and water supply storage for the Kansas River Basin, ad dressing sedimentation issues at Tuttle Creek Lake is of t he utmost importance to the people of Kansas and the goa ls of the KWO. The KWO eagerly offers its support and fi nancial resources for this WID demonstration 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.

[x] Modification to a USACE Project Authority : WRDA 2016 - Section 1122 - Beneficial Use of Dredged Material Pilot Projects

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.

The purpose of this project is to sustain long-term use of Tuttle Creek Lake for its authorized purposes, inc luding flood control, water supply, water quality, recreation, navigation, and fish_wildlife objectives. The KWO previously submitted a proposal under the WRDA 2016-Section 1122-Beneficial Use of Dredged Mat erial Pilot Projects that was not selected. This proposal is a continued effort to seek authority to add an a dditional project under Section 1122 for a specific project, the Tuttle Creek Lake WID Demonstration Proj ect. Since dam closure at Tuttle Creek Lake, 438 million cubic yards of sediment have accumulated, di splacing 62,000 acre-feet of storage for flood control and 209,000 acre-feet of storage for navigation support, water supply, and other uses. Early estimates indicate that by 2071, the multi-purpose pool will be 93% ful l of sediment, and the full reservoir up to the top of the flood control pool will be 22% full of sediment. In addition, Tuttle Creek Lake has been releasing unnaturally clear water downstream, inducing as much as 1 4 feet of degradation on the Big Blue River and leading to loss of turbidity-dependent aquatic species in th e Kansas River. The KWO proposes to partner with USACE to implement a WID field demonstration project at Tuttle Creek Lake to promote sustainable long-term reservoir sediment management. Preliminar y site assessments, sediment chemistry, and physical properties analysis conducted by the KWO, NWK, an d ERDC indicate that Tuttle Creek Lake would be an ideal location to test WID technology. This project will meet the recommendation by the Environmental Advisory Board that the Corps implement reservoir s ediment sustainability pilot projects that demonstrate different management options. This can also be use d to further satisfy the requirement in 2016 WRDA for reservoir sediment management pilot projects. Succ essful implementation of WID at Tuttle Creek Lake would serve as an example for other federal reservoirs.

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	$1,300,000	$700,000	$2,000,000
Construction	$0	$0	$0

Explanation (if necessary)

Section 1122 provides that projects under the pilot program will be cost shared in accordance with the cost share requirements for projects carried out under the Section 204 CAP. A conservative estimate for the de monstration project is a 65_35 cost share, but final values may differ from the stated estimated costs (Fed eral $1,300,000; Nonfederal $700,000). The proposed project provides the funding necessary to (1) co nstruct or rent a WID prototype, (2) demonstrate the use of the WID prototype at Tuttle Creek Lake at d ifferent elevations and flow discharges, and (3) monitor and evaluate both the operational and environment al results. The KWO has already begun working with the USACE-NWK and ERDC to develop an imple mentation plan, including monitoring and communications_outreach, and would complete those efforts pri or to the demonstration of the WID. Operational Costs* Implementation Plan - $300,000 Develo pment, Acquisition, and Mobilization_Demobilization (M_D) of WID Equipment ** - $576,000 - In cludes renting or developing and constructing the necessary WID apparatus for the demonstration. Total c ost will vary based on the final means of acquisition. Dredging Operations and Land Support Facilitie s - $320,000 Technical Report - $300,000 Subtotal Operational Costs = $1,496,000 Total Estimated O perational Costs = $1,945,000 (Includes 30% Contingency) Monitoring Costs** Pre-Demonstration & Post-Demonstration Partial Bathymetric Surveys - $30,000 In-Lake & Outfall_Stream Monitoring - $2 5,000 Total Estimated Monitoring Costs = $55,000 *Operational Project Costs assumed to be federally f unded. **Potential for KWO to provide in-kind cost-share with public-private partnerships.

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.

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, this equates to a cost of $38.7 m illion per year. Successful implementation of the proposed WID demonstration project has the potential t o create a more cost-effective and sustainable option for reservoir sediment management and advance other innovative methods aimed at extending the life of reservoir storage in Kansas. Additionally, this project supports sustainability of storage for meeting the purposes of flood risk management in the Kansas River B asin. Tuttle Creek Lake has prevented over $12.4 billion in damages over the life of the reservoir. The $2 13.7 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, it is difficult to assign a monetary value to the environmental and socio-economic ben efits of this project. Non-monetary benefits of the project include the many benefits of increased storage c apacity and available water resources, such as maintenance of water supply needed for municipal, industria l, and recreational users, as well as navigation releases. It also provides enhanced drought resiliency, impro ved water quality and quantity downstream during drought periods, and the ability to help preserve the fis heries and aquatic wildlife downstream by releasing water for longer periods. Additionally, the release of hi gher-turbidity water during normal to high flow conditions is anticipated to aid in the restoration of histori c fish species below Tuttle Creek Dam. Critically important, successful demonstration of WID technology at Tuttle Creek Lake could lead to a sustainable sediment management strategy that would extend the life of the reservoir and the associated infrastructure for all authorized purposes.

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

[x] Yes

Local Support Description

Tuttle Creek Lake is a major water source (up to 50% of the flow) for the Kansas River, which supplies pu blic drinking water for the urban populations of Kansas City, Topeka and Lawrence. Water stored in Tut tle Creek Lake is provided through a contract with the KWO to the Kansas River Water Assurance Distric t (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 p ublic 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 represe nt 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 a nd other measures by the State of Kansas on a more consistent basis to maintain storage." Additionally, t he Kansas, Verdigris, and Equus-Walnut RACs all formally recommended prioritizing the WID demonstra tion in the state budget. Furthermore, the WID demonstration would utilize resources from the Kansas River Reservoirs Flood and Sediment Study and the Sustainable Rivers Program (SRP) and advance many of the same project goals. Those efforts 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 demonstrates a collective and intense interest in the Kansas River Basin and efforts f or 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?

[x] Yes

Primary Sponsor Letter of Support

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900 SW Jackson Street, Suite 404
Topeka, KS 66612

Kansas Water Office

Phone: (785)-296-3185
Fax: (785)-296-0878
www.kwo.ks.gov

Earl Lewis, Acting Director

Laura Kelly, Governor

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 Water Injection Dredging (WID) Demonstration Project" WRRDA 7001 Proposal

The Kansas Water Office (KWO) supports the Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project to investigate the potential of WID to promote sustainable, long-term sediment management practices at Tuttle Creek Lake, as well as other federal reservoirs within the Kansas River basin system. 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.

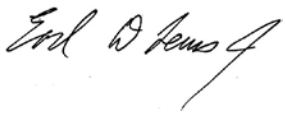
Tuttle Creek Lake is the primary water source for the Kansas River, providing the majority of flow to meet targets and more than half of the flood storage. However, recent estimates from the Kansas Water Office indicate that approximately 48% of the reservoir's original storage capacity has been lost 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. Successful implementation of the proposed WID demonstration project has the potential to provide a critically important option for reservoir sediment management 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), which the WID demonstration 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). Additionally, the Kansas, Verdigris, and Equus-Walnut Regional Advisory Committees (RACs) have all expressed formal support for a WID demonstration. 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 Water Injection Dredging (WID) Demonstration Project and looks forward to the prospect of future water planning discussions.

Sincerely,



Earl Lewis, Acting Director
Kansas Water Office

Map Document

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Study Area – Tuttle Creek Lake in the Kansas River Basin

Additional Proposal Information

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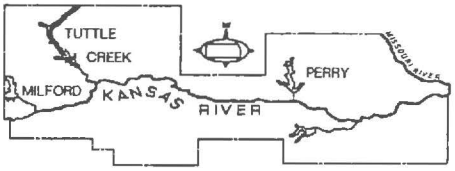
The Kansas River



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 Water Injection Dredging (WID) Demonstration Project"
WRRDA 7001 Proposal

This letter is written to express support for the Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project to investigate the potential of WID to promote sustainable, long-term sediment management practices at Tuttle Creek Lake, as well as other federal reservoirs within the Kansas River basin system. 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. Successful implementation of the proposed WID demonstration project has the potential to provide a critically important option for reservoir sediment management 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), which the WID demonstration 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). Additionally, the Kansas,

Verdigris, and Equus-Walnut Regional Advisory Committees (RACs) have all expressed formal support for a WID demonstration. 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 Water Injection Dredging (WID) Demonstration Project and look forward to the prospect of future water planning discussions.

Terry M. McCormick
President
Kansas River Water Assurance District No. 1

WaterOne
Water District No. 1 of Johnson County

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 Water Injection Dredging (WID) Demonstration Project"
WRRDA 7001 Proposal

I am writing on behalf of WaterOne to express support for the Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project to investigate the potential of WID to promote sustainable, long-term sediment management practices at Tuttle Creek Lake, as well as other federal reservoirs within the Kansas River basin system. WaterOne 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. Successful implementation of the proposed WID demonstration project has the potential to provide a critically important option for reservoir sediment management 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), which the WID demonstration 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, water suppliers, as well as the Department of the Army (Fort Riley, Kansas). Additionally, the Kansas, Verdigris, and Equus-Walnut Regional Advisory Committees (RACs) have all expressed formal support for a WID demonstration. 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.

WaterOne
Water District No. 1 of Johnson County

Administrative Offices
10747 Renner Boulevard
Lenexa, KS 66219

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With all of this in mind, I support the Kansas Water Office's WRRDA 7001 proposal for the Tuttle Creek Lake Water Injection Dredging (WID) Demonstration Project and look forward to the prospect of future water planning discussions.

Sincerely,

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