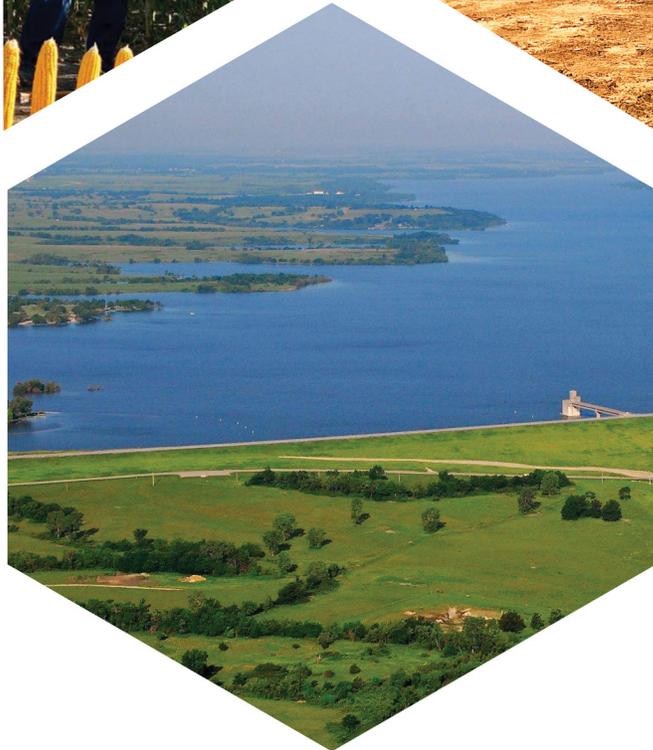


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Kansas

Water Office



**2019 KANSAS WATER AUTHORITY ANNUAL
REPORT TO THE GOVERNOR AND LEGISLATURE**

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Cover Photos

Top Left- Irrigation technology at the Circle C Water Tech Farm

Middle Left- Matt Long's Water Tech Farm in Wichita County

Middle- Roth Water Tech Farm field day and cover crops were flown over by plane

Middle Right- Harmful Algal Blooms on Milford Lake

Bottom Left- Aerial View of Melvern Lake, located in Osage County

Bottom Right- Signing of the Milford Lake RCPP agreement at the 2018 Governor's Water Conference

Chairman's Introduction & Legislative Recommendations

On behalf of the Kansas Water Authority (KWA), I am pleased to present the 2019 Annual Report to the Governor and Legislature. As many of you know, Kansas statutes grant the KWA with the responsibility to advise the Governor and Legislature on water policy matters and to share its priorities relative to the expenditure of the State Water Plan Fund (SWPF). Kansas statutes also prescribe how the KWA membership is selected to ensure the state's water and environmental interests are served in a bi-partisan manner.



Every two years, Kansans have the opportunity to choose their representation in the Kansas House of Representatives and every fourth year, the opportunity exists to select a Governor and members of the Kansas Senate. This year, we welcome Governor Laura Kelly, Lieutenant Governor Lynn Rogers, 12 new members of the House of Representatives and three new members of the Kansas Senate. I am pleased we have an entity such as the KWA to assist in ensuring continuity of the water management priorities which span our election cycles. This year, each line item in the FY2020 and FY2021 SWPF budget recommendation was developed and prioritized through a three month KWA Budget Committee process which included opportunities for each of the 14 Regional Advisory Committees and the public to provide input.

As in previous years, this Annual Report continues to focus on the conservation of our groundwater resources, and protection and restoration of our water supply reservoirs. Thanks to the efforts of the 2018 Kansas Legislature, the SWPF was enhanced by \$3.25 million to partially restore the \$6 million State General Fund (SGF) and \$2 million Economic Development Initiatives Fund (EDIF) Demand Transfers. This report outlines how these dollars are being put to use and also urges the Governor and Legislature to fully restore the statutory demand transfers and contains funding recommendations for those financial resources. The KWA is also recommending SGF enhancements for the Departments of Agriculture, Health and Environment, and Kansas Water Office totaling \$1.36 million. These enhancements are administrative in nature and while they are critical to the management of our state's water resources and implementation of the the *Long-Term Vision for the Future of Water Supply in Kansas* (the *Vision*), the KWA feels the SWPF should not be the source of funding for long-term administrative expenditures.

This Annual Report highlights the State of the Resource, an annual snapshot of ground and surface water conditions and progress in addressing key action items contained in the *Vision*. This past year had both extreme drought and extreme flooding in Kansas. Some locations even experienced both. This year was indicative of the resource vulnerabilities of our state due to weather extremes, and exposed potential issues in ensuring a reliable source of water in future decades unless bold action is taken now. We do not have the luxury of fixing our future water crisis when it occurs. The time is now.

We look forward to working with you during the 2019 Legislative Session on the priorities we have identified in this report.

Sincerely,

A handwritten signature in black ink, appearing to read "Gary Harshberger". The signature is fluid and cursive, written in a professional style.

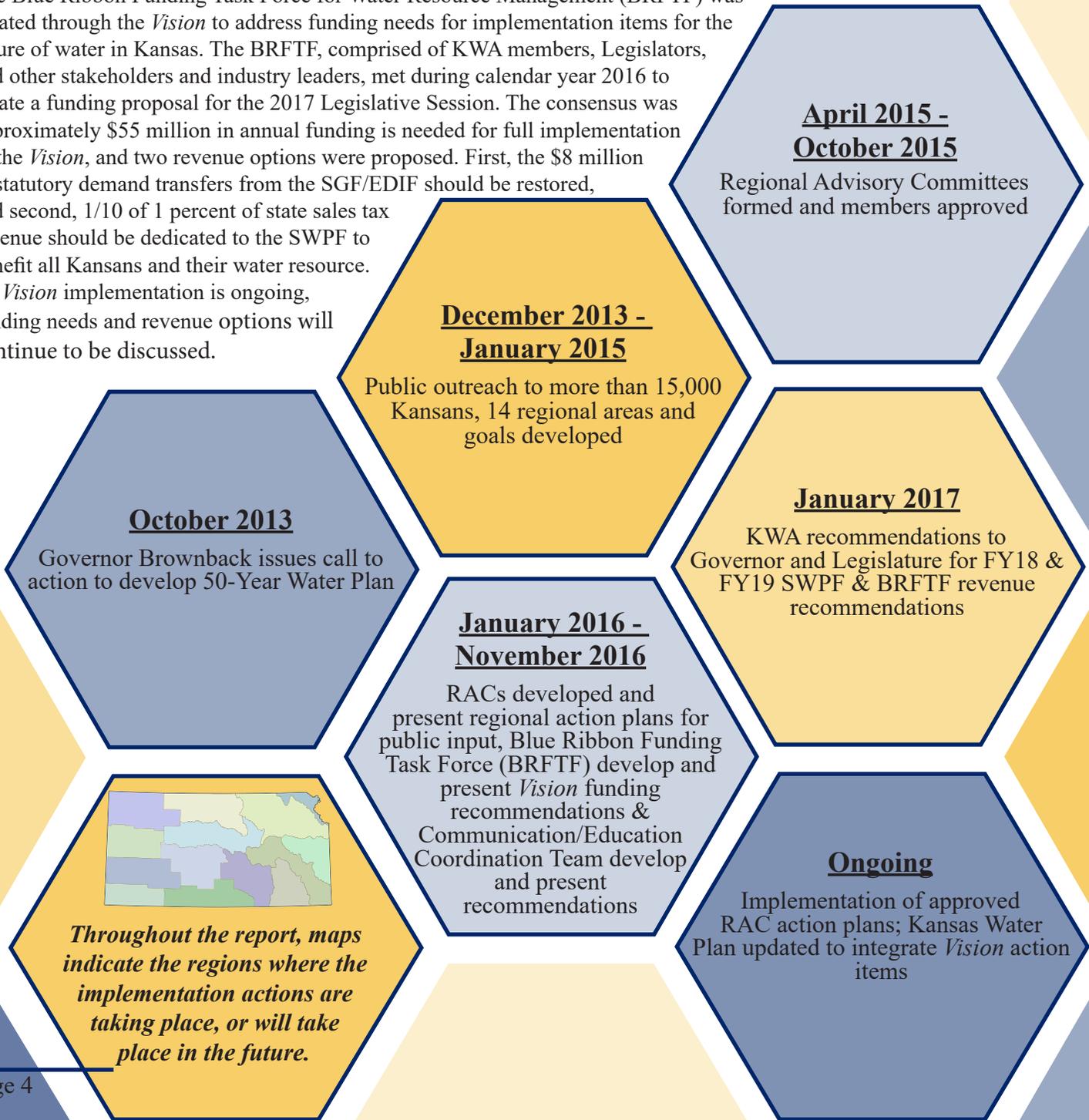
Gary Harshberger, Chair
Kansas Water Authority

Long-Term Vision for the Future of Water Supply In Kansas Implementation Time Line

Five years ago Governor Sam Brownback called for a vision to address Kansas' water supply issues. The public input process involved more than 600 meetings across the state and more than 15,000 Kansans. The final version of the *Vision* was presented in January 2015. Regional goals were established based on priority, and action plans to implement these goals were also developed.

While many action items have started, without increased funding for water projects, activities, and education in Kansas, *Vision* implementation will be limited. As of this publication, of the nearly 250 action items contained within the *Vision*, approximately 70 percent are in active stages of implementation.

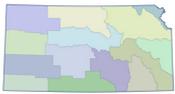
The Blue Ribbon Funding Task Force for Water Resource Management (BRFTF) was created through the *Vision* to address funding needs for implementation items for the future of water in Kansas. The BRFTF, comprised of KWA members, Legislators, and other stakeholders and industry leaders, met during calendar year 2016 to create a funding proposal for the 2017 Legislative Session. The consensus was approximately \$55 million in annual funding is needed for full implementation of the *Vision*, and two revenue options were proposed. First, the \$8 million in statutory demand transfers from the SGF/EDIF should be restored, and second, 1/10 of 1 percent of state sales tax revenue should be dedicated to the SWPF to benefit all Kansans and their water resource. As *Vision* implementation is ongoing, funding needs and revenue options will continue to be discussed.



SGF/EDIF Transfer Restoration - Regional Advisory Committee Summary

Within the *Vision*, the first of four guiding principles states that “locally driven solutions have the highest opportunity for long term success.” A key element built into the water planning process in Kansas is input from 14 RACs on water resource issues impacting their respective regions and potential solutions to address those issues.

There are currently 169 RAC membership positions across the 14 RACs with members representing the public-at-large, agriculture, public water suppliers, industry & commerce, conservation & environment there are also region specific membership categories such as groundwater irrigation in the west and watershed restoration and protection in the east. These positions provide a diverse cross-section of water use groups for locally-lead input. More than 50 RAC meetings took place during 2018 to provide RAC members updates on topics relating to regional water resources as well as forums for membership to provide local stakeholder input. The RACs participated in the SWPF budget development process in July of 2018 providing input on requested funding to the KWA.



Each of the RACs have incorporated planning, resource management, technology, and local involvement into evaluation and

implementation their respective *Vision* regional goal action plans. More than 60 action plans have been developed statewide by the RACs to specifically address local water resource issues relating to Ogallala Aquifer conservation, reservoir sedimentation, harmful algal blooms, and groundwater contamination remediation. The RACs continue to evaluate progress being made on action plan implementation progress and provide input to the KWA and KWO on implementation priorities.



K-State leading the Neosho RAC on a tour of the Geary county edge of field nutrient and sediment monitoring sites

SGF/EDIF Transfer Restoration - Summary of Request for SGF/EDIF Transfer Restoration

The KWA reviewed the agency and RAC requests on recommended projects for the SGF/EDIF transfer in FY2020 and FY2021. The KWA will continue to focus funding to priority projects that are in the *Vision* and RAC goals and action plans. It was concluded that the KWA will continue to recommend projects that were included in the 2018 Annual Report to the Governor and Legislature. The following table shows the KWA recommendations for additional SGF/EDIF restoration for FY2020 and FY2021.



Program/Project	KWA FY2020	KWA FY2021
Streambank Stabilization	\$ 1,000,000	\$ 1,000,000
Watershed Restoration and Protection Strategy	\$ 175,000	\$ 175,000
Milford Lake Watershed RCPP	\$ 600,000	\$ -
Vision Education Strategy	\$ 250,000	\$ 250,000
Watershed Conservation Practice Imp	\$ 1,800,000	\$ 1,800,000
Real Time Water Management(Telemetry)	\$ 125,000	\$ 125,000
Harmful Algae Bloom Pilot	\$ 450,000	\$ 450,000
Reservoir and Water Quality Research	\$ 350,000	\$ 350,000
Crop and Livestock Research	\$ 150,000	\$ 150,000
Irrigation Technology	\$ 500,000	\$ 500,000
Water Tech Farms	\$ 250,000	\$ 250,000
Water Supply Restoration Program		\$ 300,000
Contamination Remediation	\$ 400,000	\$ 400,000
Drinking Water Protection	\$ 350,000	\$ 800,000
Equus Beds Chloride Plume Project	\$ 100,000	\$ 100,000
Storage Purchase	\$ -	\$ 1,350,000
Water Injection Dredging	\$ 1,500,000	\$ 0
Total State Water Plan Expenditures	\$ 8,000,000	\$ 8,000,000

SGF/EDIF Transfer Restoration - *Vision Education Strategy*

FY2020: \$250,000; FY2021: \$250,000

More education and outreach regarding Kansas water resources was the most common statement heard across the state during the *Vision* development process. An Education and Public Outreach Supplement was developed for the *Vision* and implementation began this past year.



A “Kansas Runs on Water” media campaign has been initiated with research from focus groups, slogan development, and example promotional material. For both fiscal years, funding will be utilized to further the campaign by development of specific media and identification of stakeholders to cost share on implementation. Additional funding will be made available to local groups and regional advisory committees to implement educational projects that further understanding of our water resources.



SGF/EDIF Transfer Restoration - *Streambank Stabilization*

FY2020: \$1,000,000; FY2021: \$1,000,000

Streambank stabilization continues to be a key component in the reduction of sediment entering our water supply reservoirs. The Kansas Department of Health and Environment (KDHE), the Kansas Department of Agriculture (KDA), and KWO coordinate efforts, resources and pooled funding in order to accomplish streambank protection work to reduce erosion and sedimentation in priority watersheds.

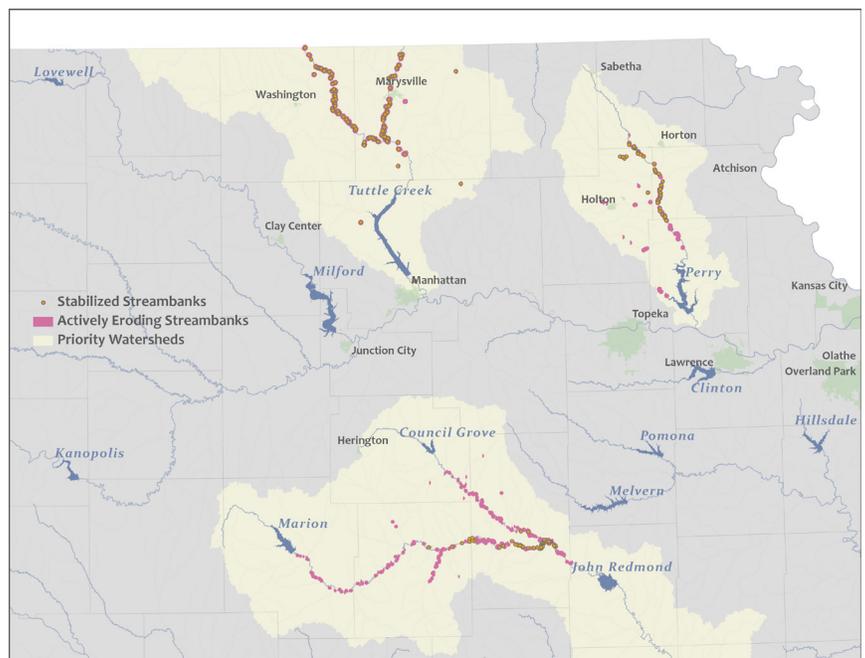
Streambank stabilization efforts continue to be concentrated in three priority Kansas watersheds above Federal reservoirs: Tuttle Creek Lake; Perry Lake; and John Redmond Reservoir. In 2018, construction was completed for stabi-



Buffer strips are an effective streambank restoration practice. This bank has re-vegetated 1-2 years post-construction

lization of four streambank sites achieving an estimated sediment load reduction of 3,600 tons per year.

Also in 2018, construction contracts were awarded for the stabilization of an additional 13 streambank sites, and design services were initiated for 12 new sites. The funding request will provide resources for five to seven additional sites each year.



The graphic on the left compares the historical total sediment load with the amount averted through best management practices in the watersheds above reservoirs



SGF/EDIF Transfer Restoration - Milford Lake Regional Conservation Partnership Program

FY2020: \$600,000

Runoff within the Milford Lake watershed in Kansas is a source of nutrient loading contributing to the formation of harmful algal blooms (HABs) within the lake. This Regional Conservation Partnership Program (RCPP) project, in conjunction with United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS)



The signing of the Milford Lake RCPP agreement at the 2018 Governor's Water Conference

and nearly 30 other partners, will implement conservation practices within the Milford Lake watershed to decrease nutrient runoff which will decrease the formation of HABs.

The \$600,000 included within the KWA SGF/EDIF transfer restoration request would provide the remaining partnership funding necessary for KWO to meet partnership contribution obligations for the project as well as maintain the USDA-NRCS \$2.88 million commitment to the project.



Harmful Algal Blooms on Milford Lake



SGF/EDIF Transfer Restoration - Watershed Conservation Practice Implementation

FY2020: \$1.8 million; FY2021: \$1.8 million

Watershed conservation practice implementation within the *Vision* priority watersheds is necessary to protect water supply storage and improve water quality in reservoirs across Kansas. Conservation practice implementation provides the most cost effective means of addressing these issues.

In FY2019, \$900,000 was awarded to producers within the Tuttle Creek, John Redmond, Kanopolis, and Fall River

watersheds through the Kansas Reservoir Protection Initiative in support of sediment-reducing conservation practice implementation. Additional funding for watershed conservation practice implementation in support of the *Vision* and RAC action plan implementation will provide further cost share opportunities for producers within targeted Kansas watersheds.



SGF/EDIF Transfer Restoration - Watershed Restoration & Protection Strategy

FY2020: \$175,000; FY2021: \$175,000

The Kansas Watershed Restoration and Protection (WRAPS) Program contributes to the Kansas Non-point Source (NPS) Management Plan through the implementation of a voluntary, targeted watershed based program funded by Clean Water Act (CWA) 319 and the SWPF. This approach involves: identifying watershed protection and restoration needs, establishing watershed protection and

restoration goals, developing 9 Element Plans to achieve established goals, and implementing fully developed plans.

The requested funding will be leveraged with other sources of federal, state, local, and private funding to further advance WRAPS watershed plan implementation activities within identified priority watersheds in Kansas.



SGF/EDIF Transfer Restoration - Harmful Algae Bloom Pilot Project

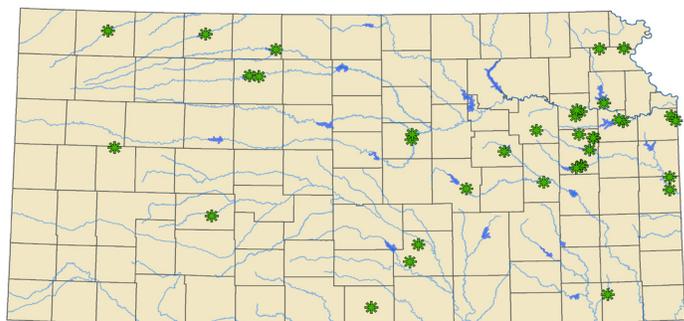
FY2020: \$450,000; FY2021: \$450,000

Several of the state's federal reservoirs and smaller impoundments continue to experience HABs. The HABs produce potent toxins that can cause human and animal illness and even death. In some cases, the affected lakes have to be closed in order to protect public health. As a result, lakes in Kansas that are affected by HABs are unable to meet all of their designated uses, which include recreation and public water supply (where applicable).

In FY2019, the legislature appropriated funding for a HAB pilot project to be developed and administered by the KDHE. The project is focused on HABs at Milford Lake and Marion Reservoir, with a goal of reducing the duration and frequency of harmful algal bloom events. The project will evaluate and pilot several different methods and technologies aimed at mitigating in-lake HAB events. Funding for FY2020 and FY2021 will continue this work and potentially evaluate other mitigation technologies.



Harmful Algal Blooms on Marion Reservoir



Map of HAB Affected Waters in 2018

SGF/EDIF Transfer Restoration - Reservoir & Water Quality Research

FY2020: \$350,000; FY2021: \$350,000

In 2018, funding appropriated by the Legislature for *Vision* implementation research was utilized to support a number of reservoir and water-quality research initiatives, including the implementation of reservoir-related data collection, analysis and research of sediment and HABs, research related to sediment-reducing practices such as streambank

stabilization projects, as well as the continuation of the Kansas River Alluvial Index Well Network and the associated stream aquifer model. Additional funding is necessary to continue these various multi-year research efforts. A research coordination group has been established and reports to the KWA on each of these issues.



SGF/EDIF Transfer Restoration - Crop & Livestock Research

FY2020: \$150,000; FY2021: \$150,000

The Collaborative Sorghum Investment Program (CSIP) is a producer and University (K-State) partnership platform leveraging partner resources and building high performing research teams with field level deliverables. A diverse cropping system including sorghum, wheat, corn, soybean, and other crops gives farmers water-efficient management

opportunities within and across seasons. Public-private investment in sorghum can address existing technology gaps and generate enhanced sorghums for Kansas. Funding provided in FY2019 is being used within this program to evaluate sorghum and its' potential as a lower water use crop. Funding is necessary over a multi-year period to bring alternative varieties to market.



SGF/EDIF Transfer Restoration - Irrigation Technology

FY2020: \$500,000; FY2021: \$500,000

Increased participation in conservation programs such as Water Conservation Areas (WCAs) and Local Enhanced Management Areas (LEMAs) has led to more interest in finding feasible, innovative solutions to conserve and extend the local groundwater resources. The most effective way to approach conservation is to implement modern irrigation technology that can increase efficiency while educating producers on better irrigation & water management practices.

Funding provided in FY2019 is being targeted to deploy irrigation technology to producers in LEMAs or those implementing WCAs. Funding for these cost-share initiatives and practices in



FY2020 and FY2021 will again be targeted to producers in these programs as we see the total number of acres in conservation programs expand.



Irrigation Technology, such as this nozzle, is being deployed across the Ogallala

SGF/EDIF Transfer Restoration - Water Technology Farms

FY2020: \$250,000; FY2021: \$250,000

Water Technology Farms (Tech Farms) are public-private partnerships where various irrigation technologies and management strategies can be demonstrated to help educate producers in the area. Each of the current Tech Farms operate differently and have implemented a variety of technology and equipment to help reduce water use and develop better efficiency practices with multiple types of crops.

The number of Tech Farms has grown from three in 2016, seven in 2017, to 10 in 2018. As more and more Tech Farms are being requested across Kansas by producers and landowners, FY2020 and FY2021 funding will allow for a



more diverse spread of technology and research to be demonstrated. As work begins on water quality technology, the costs to

monitor the effectiveness of the practices increases significantly resulting in the funding request.



Water Technology Farm Field Day at Hatcher Land & Cattle

SGF/EDIF Transfer Restoration - Real Time Water Management (Telemetry)

FY2020: \$125,000; FY2021: \$125,000

The Kansas Department of Agriculture-Division of Water Resources (KDA-DWR) currently has approximately 20 telemetry units. These units have been key to studying and understanding complex well-to-well and aquifer interactions mostly in the central and western part of the state. The data collected from these units has been used to verify and augment other regular water level measurements and to develop reports on groundwater impairment. The proposed

funding would be used to purchase and install about 60 telemetry units with a varying mix of water level transducers to measure the water level in the aquifer, and flow rate loggers to measure the pumping rate at the well. The telemetry units would transmit the data recorded from the water level transducers and the rate loggers to a website where the well owner and KDA would have access to the data to assist with better water management decisions.



SGF/EDIF Transfer Restoration - Contamination Remediation

FY2020: \$400,000; FY2021: \$400,000

The Orphan Sites Program in KDHE's Bureau of Environmental Remediation uses money from the SWPF for the assessment and remediation of contaminated sites where the responsible party is unknown or unable to undertake the necessary cleanup action. The purpose of this program is to prevent human exposure to hazardous chemicals or pollutants while protecting the environment from the effects of hazardous chemicals or pollutants to soil, sediment,



groundwater, surface water, or other natural resources of the state. There are currently 104 orphaned sites in the program. Sites which pose the most-serious threat to the public and the environment are remediated.

An additional \$400,000 is being requested for FY2020 and FY2021 to complete investigative activities for one site (in McPherson), clean up contamination at two sites (in Wellington and Humbolt), and prepare a remedial design for a fourth site (in Salina).

SGF/EDIF Transfer Restoration - Drinking Water Protection

FY2020: \$350,000; FY2021: \$800,000

The purpose of the Drinking Water Protection (DWP) program is to ensure all Kansas communities have a source of clean, healthy, affordable drinking water by planning and implementing strategies to prevent and mitigate contamination. Public Water Supply (PWS) systems that show trends in increased nitrate content, or have occasionally violated the



maximum contaminant level, will be the focus of the DWP program.

A funding request of \$350,000 in FY2020 and \$800,000 in FY2021 will be used to help with the investigation needs of each PWS and to implement best management practices (BMPs) to improve drinking water quality. The most common BMPs for the first phase of the DWP program will be focused on agricultural land use.

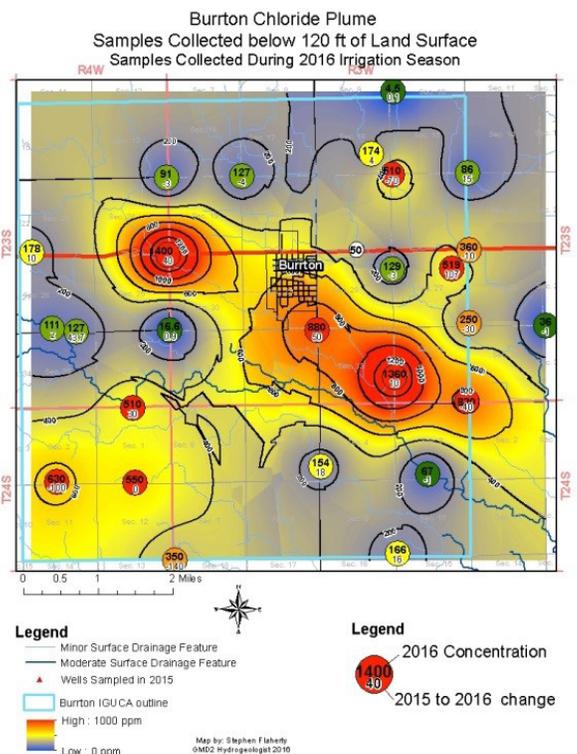
SGF/EDIF Transfer Restoration - Equus Beds Chloride Plume Project

FY2020: \$100,000; FY2021: \$100,000

Chloride contamination within the Equus Beds Aquifer from previous oil field production has resulted in areas of groundwater which is unsuitable for most uses. The KWO has been collaborating with Equus Beds Groundwater Management District #2 (GMD2) and the City of Wichita on the development of a process to prioritize potential chloride remediation sites, evaluation of remediation alternatives, and management alternatives for generated waste streams. A request for proposals for elements of this overall process will be conducted by GMD2 with FY2019 funding. Additional funding in FY2020 and FY2021 will complete the alternative evaluation process and produce options for implementation.



Map Courtesy of GMD2



SGF/EDIF Transfer Restoration - *Future Use Reservoir Storage Purchase*

FY2021: \$1,350,000

The Public Water Supply (PWS) Program and the State of Kansas, through contracts with the U.S. Army Corps of Engineers (USACE), owns water supply storage in 14 reservoirs throughout the state and maintains water supply contracts with municipal and industrial users. In five reservoirs, (Big Hill, Clinton, Hillsdale, Milford and Perry) the state has been able to delay payment until additional storage is needed and the storage is called into service. Once the storage (known as 'future use' storage) is called into service, an immediate amortization payment is made on the principal and interest, and the operation and maintenance costs associated with the additional storage would be incurred in the following year.

There is not currently a revenue stream identified for future use storage in Milford and Perry reservoirs before the end of the contract period. To begin to address the issue, a portion of the future use storage in Milford will be called into service and the state will begin annual amortized capital cost payments. In addition to reducing overall program debt, calling in future use storage will secure the available storage for water supply to support long-term water supply needs within the basin.



SGF/EDIF Transfer Restoration - *Water Supply Restoration Program*

FY2021: \$300,000

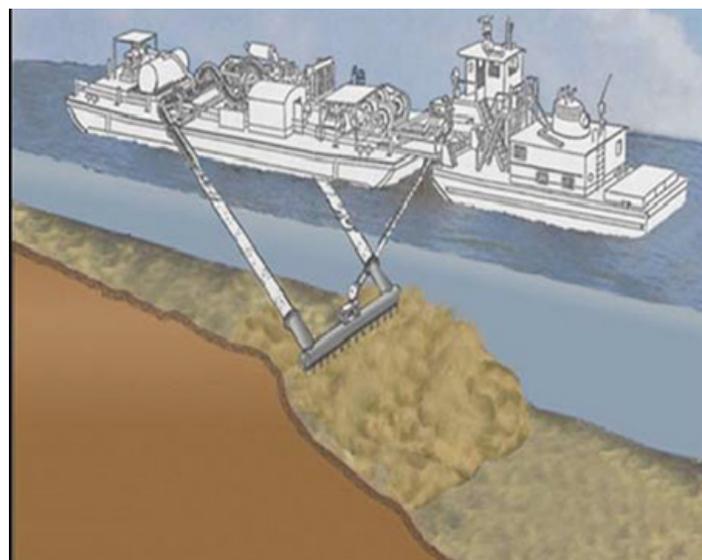
The Water Supply Restoration Program is a voluntary, incentive-based water management program. The program is designed to assist eligible sponsors to restore and protect water supply lakes where appropriate watershed restoration and protection are planned or in place. Santa Fe Lake, located in Butler County, is the water supply source for Augusta, Kansas and its wholesale customers, serving a population of about 20,000 customers. It is also a well-populated recreational attraction in the Wichita metro region. Funding from the Water Supply Restoration Program would be used as the state's cost share to replace the ogee weir spillway and remove harmful vegetation from the outflow channel of the lake. The spill way is severely damaged and has been noted in multiple dam inspection reports as in need of immediate replacement.



SGF/EDIF Transfer Restoration - *Water Injection Dredging*

FY2020: \$1,500,000

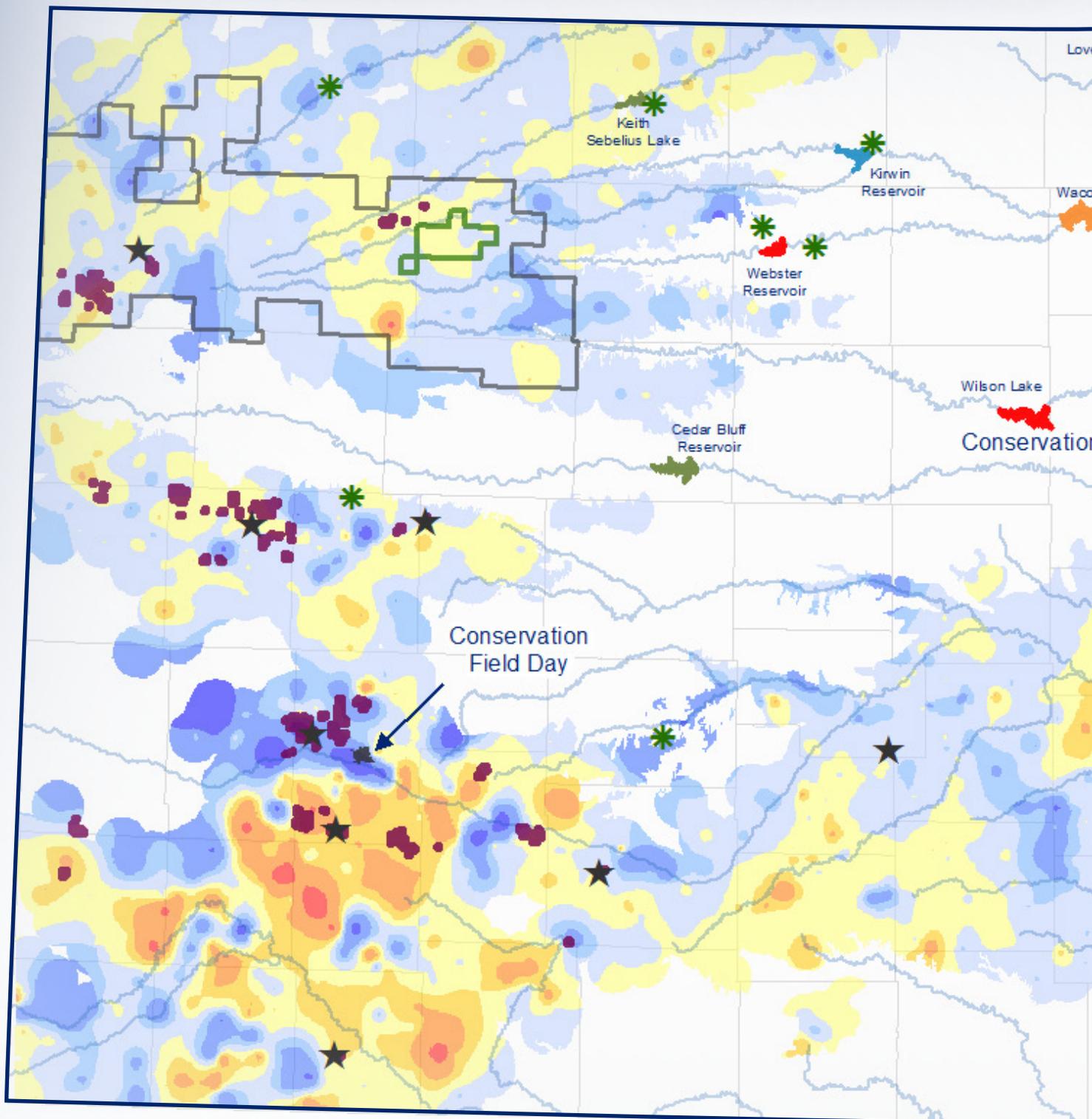
The KWO, in partnership with the USACE, plans to implement a Water Injection Dredging (WID) project at Tuttle Creek Lake to promote sustainable long-term reservoir sediment management. The WID is a process in which large volumes of water are injected at low pressure into the sediment bed near the bottom of the reservoir. The injected water effectively fluidizes the sediment creating a 'density current' that allows the sediment to flow by gravity. In the case of Tuttle Creek Lake, the proposed WID demonstration project would move the sediment toward the existing dam outlet, and monitor the flow of the density current through the outlet during controlled discharges. The proposed demonstration project will include construction of a WID prototype, demonstration of the WID prototype at Tuttle Creek Lake at different elevations and flow discharges, and comprehensive monitoring and evaluation of both the operational and environmental results.



This graphic depicts the density current created by the water being injected into the sediment in the reservoir



MEASURING SUCCESS:



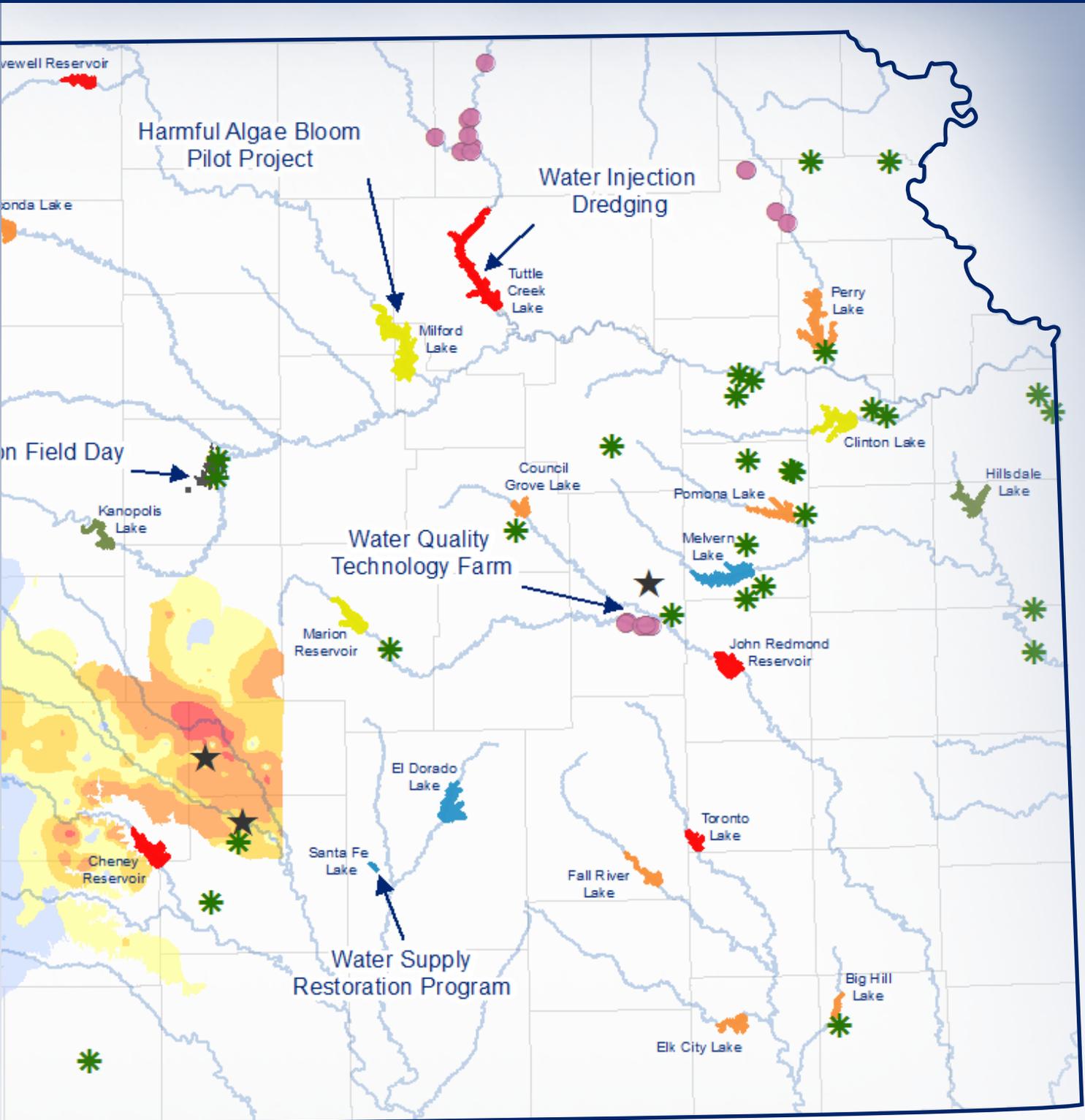
In 2018, 14 State of the Resource Reports were published for each regional planning area. These annual reports provide background context, show the current status of the water resource, Vision items being addressed in the region, and future actions needed to sustain or conserve the resource going forward. The statewide map above is a snapshot of the past year's progress and challenges facing the resource in the future. The map and reports will continue to show the progress towards Vision implementation, regional goal and action plan completion, and improvements or issues needing continued attention.

2017-2018 Water Level Change

Change in Feet

- Decline greater than -5
- -2 to -5
- -1 to -2
- 0 to -1
- 0 to 1
- 1 to 2
- 2 to 5
- 5 to 10
- Rise over 10

STATE OF THE RESOURCE



Change



Unfunded Liability & Capital Development Plan

The KWO operates the Kansas Water Marketing and Water Assurance programs as part of its Public Water Supply Program. Pursuant to K.S.A. 82a-1308, KWO has continued to update and publish the Water Marketing Capital Development and Storage Maintenance Plan. The purpose of this plan is to provide for the long-term planning of future Water Marketing Program needs, including acquisition of all the water supply storage under federal contracts, potential new storage development and protection and restoration of the storage owned by the State.

Kansas has contracts with USACE for purchase of water supply storage in 14 reservoirs; 12 of those have storage currently committed to, and being paid for by the customers of the Water Marketing Program, eight of the reservoirs have storage that has been sold to Assurance Districts for district members, and five of the reservoirs have future use storage that has been purchased by

the State, but has not yet been called into service.

In 2017, at the direction of KWA's Public Water Supply Committee (PWS Committee), the KWO began development of the PWS Comprehensive Capital Development Plan (CCDP). Prior to this updated plan, the KWA sought to flatten out variations in the marketing program rate to be able to lend financial stability to both customers and the program. A stepped increase in the variable rate was adopted by the KWA in conjunction with discussions on reservoir restoration. The previously approved flattened rate was projected to provide adequate revenue to cover program expenses and provide funding for protection and restoration projects in the near term; however, the plan indicated that the long-term financial needs of the program would require future analysis.

As part of the development of the 2017 CCDP, the PWS Committee directed KWO to analyze water marketing variable rate scenarios that would allow a portion of the revenue

generated through the marketing program to pay down existing debt, with a portion or revenue dedicated to fund reservoir protection and restoration projects that would benefit the program. It was determined that, due to the future use storage calls that will be made by the marketing program within the next 20 years, the previously approved flattened rate would not meet program needs in the long-term.

The 2017 CCDP includes an update to the variable marketing rate structure with a projected annual increase, in lieu of the previous flattened rate. Revenue generated in the near term is planned to be

*In 2018,
marketing revenue was
utilized to pay off the
remaining liability
associated with the state's water
storage purchase contracts at
John Redmond Reservoir
and Elk City Lake.*

	Water Supply Storage (2018)					
	Water Quality/Other	Water Marketing	Water Assurance	Access District	Reserve Capacity	Future Use
Big Hill		8,027				14,395
Clinton	22,281	56,283				37,483
Council Grove	9,547	18,289	6,233		8,043	
Elk City	4,908	20,026			9,924	
Hillsdale	16,756	18,748				40,452
John Redmond	14,872	43,116	4,445			
Kanopolis	23,559	10,350		10,209		
Marion	28,578	36,455	342		14,273	
Melvern	97,328	14,706	10,651		25,862	
Milford		56,829	66,988			241,641
Perry			31,853			159,224
Pomona	13,225	796	12,379		25,518	
Toronto		400				
Tuttle Creek	133,573		76,699		16,046	
Total	364,627	284,025	209,590	10,209	99,666	493,195

Unfunded Liability & Capital Development Plan

utilized to pay down a portion of the program debt. This will help to alleviate the large increase in annual program payments necessary to pay for future use storage.

The CCDP will be updated in 2019, primarily to account for changes to marketing contracts and revised projected Operation and Maintenance (O&M) costs provided by USACE.

Unfunded Liability - Future Use Storage

Future use reservoir storage is considered storage that is not currently in service. Some of the water supply contracts between the USACE and KWO allow the State to defer payments on the storage until the storage is needed. The USACE retains ownership of future use storage until the State calls it into service. There are currently five reservoirs containing future use storage: Big Hill, Clinton, Hillsdale, Milford and Perry.

before the end of the contract period, for Milford (2034) and Perry (2041). Current projections indicate the storage in the Kansas River system will be fully needed by 2057. This creates a time gap between the call in of future use storage in Milford and Perry and the need for the associated storage. The KWO is continuing the development of a strategy to fund the future use storage calls at Milford and Perry. This year, a budget request was made to begin payment of a portion of the future use storage in Milford Lake in FY2021 (see pg. 11).

Lake	Big Hill	Clinton	Hillsdale	Milford	Perry
2018 Water Supply Storage (AF)	22,423	93,766	59,200	365,458	191,077
2018 WS Storage In-Service (AF)	8,027	56,283	18,748	123,817	31,853
2018 Water Supply-Future Use (AF)	14,395	37,483	40,452	241,641	159,224
Percent Future Use	64%	40%	68.33%	66%	83%
Year Contract Payment Complete	2029	2027	2030	2034	2041
Est. 2018 Cost of Future Use Storage	\$12,666,065	\$7,252,111	\$46,292,691	\$25,024,689	\$24,729,456
Interest Rate	4.012%	3.50%	4.01%	2.63%	3.05%
Annual Principal & Interest Payment	\$1,298,443	\$842,584	\$4,460,423	\$1,797,506	\$1,424,078
Additional Annual O&M Payment*	\$203,356	\$114,282	\$285,086	\$199,240	\$441,162
Total Additional Annual Payment	\$1,501,799	\$956,866	\$4,745,509	\$1,996,746	\$1,865,240

Additional O&M payments with Future Use Storage call-ins are estimated using 5-year average O&M cost projections, as provided by USACE.

The above table indicates the future use storage amounts in all state-owned reservoirs, based on 2018 conditions and capacity, and the estimated costs to call in all future use storage in these reservoirs in 2018.

The 2017 CCDP includes a schedule to call all of the remaining future use storage in Clinton, Hillsdale, and Big Hill reservoirs into service by the end of their respective contract terms. Perry and Milford reservoirs provide important support to the Kansas River system; as such, it is anticipated a portion of the future use storage would be acquired and dedicated to the use of the Kansas River Water Assurance District (KRWAD).

Based on projected future water supply use needs of the KRWAD, all of the future use storage will not be needed



Perry Lake located in Jefferson County, Kansas

Ogallala Aquifer Initiatives - Water Technology Farms

Entering their fourth year, Tech Farms continue to showcase the latest in irrigation technology, field-scale research, and water conservation efforts. The ability to demonstrate new irrigation technologies, management techniques and cropping patterns on a larger scale continues to be an effective communication and outreach tool for producers in the Ogallala region. The farms also provide an opportunity for agronomic research to be conducted by the Kansas State Research and Extension office of Southwest Kansas.

As of December 2018, there are a total of 10 Tech Farms across western Kansas. Three were established in 2016, three more in 2017, and four more came online in 2018. The focus continues to be on water conservation, but has evolved to include water quality being applied to soil and crops, as well as overall soil health. One method of technology proven to conserve water is the utilization of soil moisture probes and the ability of producers to effectively use the data they provide. These probes have given producers an in-depth look at what the moisture is doing under the surface and can help to determine when watering is and isn't necessary. Nick Hatcher of the Hatcher Land & Cattle Water Technology Farms said, "Even though we had gone through a drought, we realized with using the management tools and probes we did have adequate moisture and were able to hold off on starting those wells, which contributes to saving water."

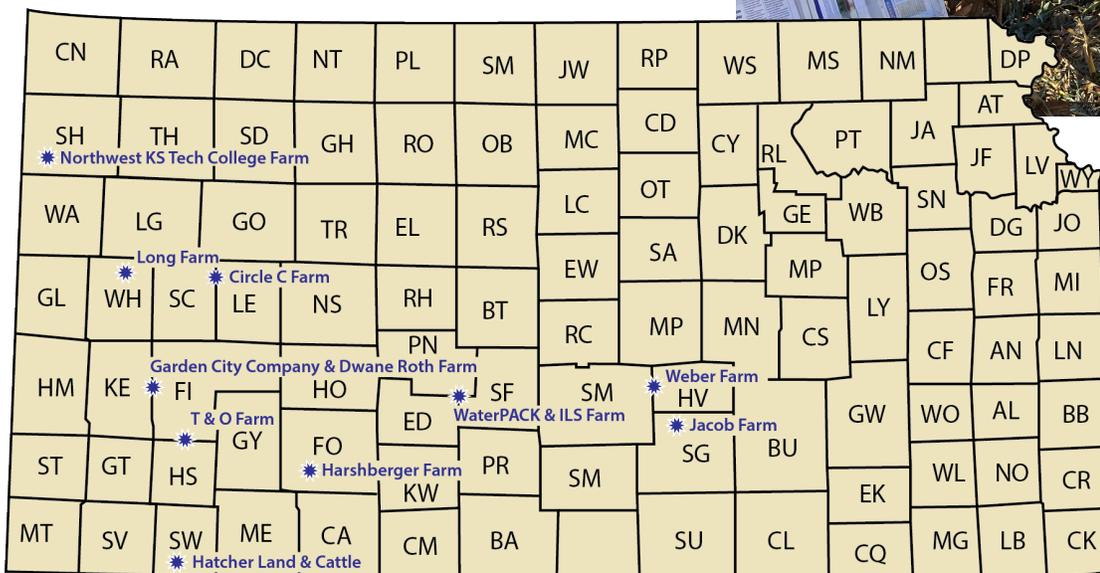
By applying these tools and technologies a producer can reduce water use significantly compared to past use. For the producer, the lower water use results in lower input costs and potential for increased profitability.

"Our end goal, of course, is to try to be more efficient, cut our costs, grow good crops with less input, more bushels with less water, and we're looking at newer technologies to get us there," said producer Ryan Speer who operates the Jacob Water Technology Farm.

All 10 Tech Farms were featured at field days during the month of August, where hundreds of producers gathered to see the technology first hand. The value of these farms is seen in the growing and continued interest in technology adoption across Kansas.



Demonstrated irrigation efficiencies at Tech Farms



Ogallala Aquifer Initiatives - *Water Conservation Areas*

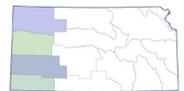


Matt Long's Water Tech Farm in Wichita County is a WCA with a 7 year plan to make a 29 percent reduction, while not seeing reductions in yield

A WCA is a simple, streamlined, flexible tool that allows any water right owner or group of owners the opportunity to develop a management plan to reduce withdrawals in an effort to extend the usable life of the Ogallala-High Plains Aquifer. A WCA is a designated area with an approved management plan developed by a water right owner or group of water right owners with the consent of the Chief Engineer to reduce water withdrawals while maintaining economic value via water right flexibility.

Participation within a WCA may afford flexibilities that are not available to water right owners outside of a WCA. These flexibilities may include elements such as creating multi-year water right allocations, moving allocations between enrolled water rights, allowing for new uses of water, and others. The WCAs do not make any permanent changes to enrolled water rights.

As of early December 2018, there are 22 approved WCA management plans that incorporate more than 41,500 irrigated acres across the state of Kansas. Seven of the WCA plans were approved during the 2018 calendar year.

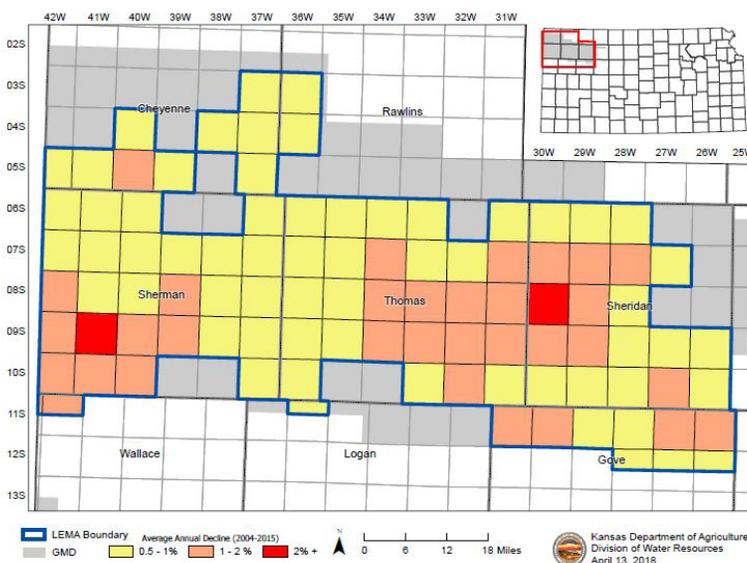


Ogallala Aquifer Initiatives - *Local Enhanced Management Areas*

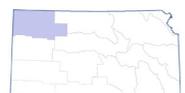
Currently there are two official LEMAs in the state of Kansas. The first approved LEMA was the Sheridan-6 LEMA which covers 99-square miles in Sheridan County and a small portion of Thomas County. The first five-year term of the Sheridan-6 LEMA expired at the end of 2017 but the

success in water conservation while maintaining the economy led producers to request renewal of the LEMA. Initially, the Sheridan-6 LEMA limited water use to no more than 55 acre inches per irrigated acre covered by the water right over the five-year period; these terms also apply to the second five-year term (2018-2022).

GMD No. 4 District-Wide LEMA



On April 13, 2018 the Groundwater District No. 4 (GMD4) LEMA, which encompasses nearly the entire district, was approved by the Chief Engineer of Kansas. This LEMA sets irrigation user allocations by townships in the district. The allocations are based on the overall impact of past pumping. If a township showed historically larger groundwater declines, the township was given an allocation less than others where pumping did not impact the aquifer as drastically. This LEMA is also a five-year term from January 2018 until December 2022 with potential to renew.

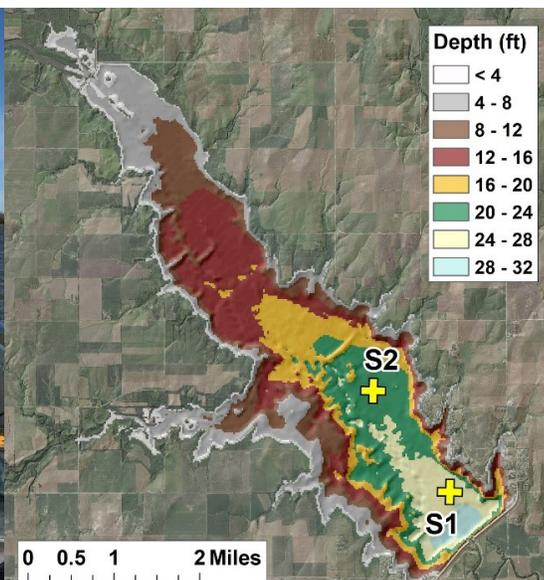


Reservoirs & Supply Sustainability - *HAB Research & Evaluation*

Utilizing funding appropriated by the legislature for *Vision* implementation research, the Kansas Biological Survey (KBS) has been conducting extensive HAB-related research. The KBS has collected sediment cores from Marion and Sebelius reservoirs in order to reconstruct historical HAB events and perform HAB-related analyses.



Photo Courtesy of Kansas Biological Survey, KU



Marion Reservoir bathymetry and sediment core sample sites for HAB-related research by KBS

Cyanobacteria collected from Milford and Marion reservoirs by KBS staff are being grown under controlled conditions at the KU Field Station. The KBS researchers are working to determine growth characteristics, predict reservoir susceptibility to HABs, determine conditions enabling the prediction of HABs as toxin release events, and to develop potential management recommendations.

For the past six years, the USGS has been working

with the KWO, KDHE, the cities of Manhattan, Topeka, Lawrence, Olathe and WaterOne of Johnson County to monitor nutrients and algae in the Kansas River. This work is targeted at better understanding in river algae development and transport to provide earlier warning of potential water quality issues.



Reservoirs & Supply Sustainability - *Conservation Field Day*

The RACs with a goal to address public water supply efficiency in the region are hosting field days to highlight conservation efforts related to public water supply usage. Two water conservation field days took place in 2018, one in Salina and the other in Garden City.

The field days featured efforts and achievements by public water suppliers, agriculture, and local industry to reduce-water consumption or become more efficient in their use of water. Each of the presenters discussed water conservation as it related to agriculture, municipal use, and the statewide health of Kansas citizens and the economy.

Attendees left both water conservation field days with ideas and examples of maximum output for water used and management of the essential resource. These field days are not only an important education tool, but are also an important piece in accomplishing the RAC's goals and action plans.



Fred Jones, Garden City and Upper Arkansas RAC Chair presents on ways the city and the RAC work towards water conservation



Reservoirs & Supply Sustainability - *Federal Partnerships through Leveraging of Funds*

Water supply resources across the State of Kansas benefit from local, state, and federal investment. The KWO and other agencies have continually sought to leverage funding and investment through collaboration and cooperation with other entities working towards the common goal of supply sustainability. As reservoirs are a major source of public water supply, engagement with federal partners such as the USACE is critical in the efficient and effective management of the resource.

Numerous federal-state partnerships have evolved over the past year to address issues such as reservoir sedimentation, water quality, and nutrient management. Working primarily with the USACE Kansas City and Tulsa Districts, KWO has active partnership agreements to address statewide water resource issues. Studies and planning are underway in priority watersheds to address sediment management, water quality, and ongoing monitoring of streams and lakes.

The State currently has federal partnering agreements with the USGS to monitor streamflow, sediment, and water quality in a number of streams. In addition, efforts are un-

derway with the USACE to evaluate reallocation of storage at Melvern and Kanopolis reservoirs as well as sediment bypass at Tuttle Creek Lake. The USDA-NRCS is engaged through the Milford Lake RCPP to target funds to practices that reduce nutrients entering streams in the Lower Republican basin.



KWO Director Tracy Streeter providing the Kansas perspective to the USACE Commanders Training in Kansas City



Reservoirs & Supply Sustainability - *Neosho Regional Water Quality Tech Farm*

As part of the Neosho RAC goals and actions plans, the KWO is working to implement two Water Quality Technology Farms (WQTFs). At these two farms, nutrient and sediment loss will be monitored by comparing current rates and those after the introduction of BMPs, such as no-till, cover crops, cover crop grazing, reduced fertilizer application, or change in fertilizer placement and/or timing.



WQTF locations in the Neosho region

Both farms are located in Lyon County and belong to two separate landowners.

The data collected through the implementation and study of the WQTFs will be used to demonstrate the potential reduction of soil and nutrient runoff through BMP implementation. By reducing runoff, producers can maintain soil quantity, quality, moisture, and nutrient content. In addition to savings for producers, the implementation of BMPs will improve water quality and help secure water supply in the federal reservoirs for the citizens of the Neosho watershed

in both Kansas and Oklahoma.



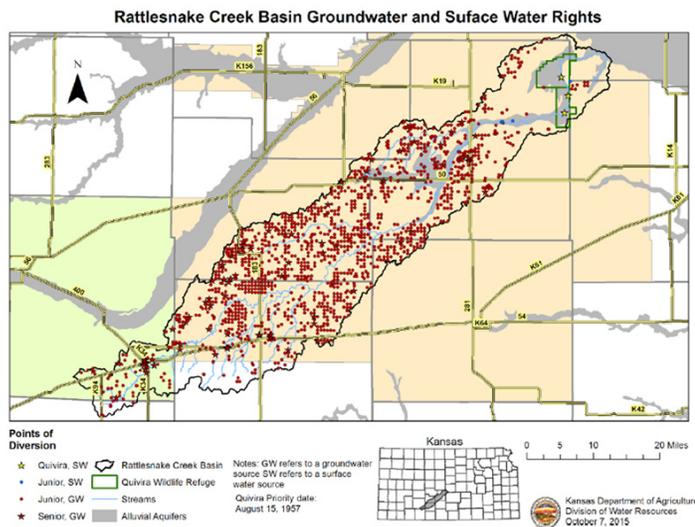
Dr. Nathan Nelson (KSU) explains the layout and design of the Edge of Field Monitoring (EOF) that will be implemented



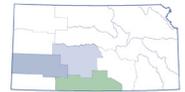
Statewide Water Issues - Quivira National Wildlife Refuge

The U.S. Fish and Wildlife Service (USFWS) has a senior water right for use at the Quivira National Wildlife Refuge fed by the Rattlesnake Creek in Stafford County. In 2013, the USFWS filed an impairment complaint on the basis that junior water rights were reducing flows on

Rattlesnake Creek to the point that Water Right File Nu. 7571 could not be exercised. In 2016, the Chief Engineer of KDA-DWR issued the final report for the impairment investigation determining that upstream depletions have impaired the Quivira Refuge Water Right.



In an attempt to remedy this situation, KDA-DWR has been working, and continues to work, with Big Bend Groundwater Management District No. 5 (GMD5) to develop a LEMA for the Rattlesnake Creek basin along with adjacent areas where groundwater pumping is impacting Rattlesnake Creek. Potential actions that may be included within the plan are end gun removal, augmentation, and a number of voluntary actions to reduce water use. The USFWS has submitted a formal request to KDA-DWR to secure water for the 2019 calendar year that will require action to either administer junior rights or implement other actions that ensure the water right is fulfilled.



Statewide Water Issues - Hays/Russell - R9 Ranch Water Transfer

In the 1990s, the cities of Hays and Russell purchased the R9 Ranch in Edwards County, near Kinsley. At that time, the property was in irrigated agriculture with 40 water rights covering 7,647 acre-feet of authorized quantity being withdrawn from more than 50 wells.

Three years ago, the cities began the process to request permission to convert the water rights to municipal purposes and transfer the water from the R9 Ranch to Hays and Russell. Recently the Chief Engineer of KDA-DWR released a draft contingent approval document for the applications to change the use made of water. Comments from local entities, including the local groundwater management district, are currently being reviewed.

If the change applications are contingently approved, the next step is to initiate a water transfer proceeding under K.S.A. 82a-1501 et seq. A transfer panel of the Chief Engineer, Director of the KWO, and Secretary of KDHE, through a hearing officer, will hear testimony and determine if it is the state's overall best interest to allow the transfer of the water. This would be a nine – 15 month process.



Statewide Water Issues - Interstate Water Cooperation

Republican River Compact

There are four interstate compacts which partially govern our interactions with our neighboring states. The Arkansas River Compact with Colorado, the Republican River Compact with Nebraska and Colorado, the Blue River Compact with Nebraska and the Arkansas River Compact with Oklahoma. Over the last few decades, we have experienced legal conflict on the Arkansas with Colorado and on the Republican River Compact. There remain a number of issues that require attention on both of these compacts with KDA staff being dedicated to ensuring our neighbors comply with the compact requirements.

In regard to the Republican River, Kansas first sued over violations of the Republican River Compact in 1998. That first suit was resolved with a U.S. Supreme Court approved settlement in 2002. When Nebraska failed the first tests of compliance under the settlement in 2007, Kansas again sought relief before the Supreme Court. The last court action was finished in 2014. Under that action, Nebraska paid Kansas \$5.5 million, \$3.5 million of which is being used in the Lower



Republican in Kansas to increase our water conservation and management of the additional water that is being received. Over the last three years, representatives from the three states have been meeting on a nearly monthly basis to improve relationships and negotiate outstanding issues related to Colorado and Nebraska's compliance operations. In 2016, separate agreements were reached with both Nebraska and Colorado related to these operations, enhancing the reliability of our water supply.

On August 1, 2018, another significant agreement was reached between the states of Kansas and Colorado., to address Colorado's past overuse of their South Fork Republican allocation. Colorado has sent \$2 million to Kansas for use on projects that benefit the South Fork Republican. Colorado also committed another \$2 million in the South Fork in Colorado to reduce water use and improve the reliability of streamflow coming into Kansas.



Republican River Compact Commissioners Kevin Rein - CO State Engineer, Jeff Fassett - NE Director of Dept. of Natural Resources, David Barfield - KS Chief Engineer

Statewide Water Issues - Aquifer Storage and Recovery Project

The City of Wichita currently operates an Aquifer Storage and Recovery (ASR) project which allows for the diversion of water from the Little Arkansas River during high flow periods, treats the diverted water to drinking water standards, and then injects the treated water into the Equus Beds Aquifer for later recovery and use. Through this process, the City of Wichita accumulates recharge credits allowing Wichita to withdraw this additional water from the Equus Beds Aquifer. With the recent recovery of the Equus Beds Aquifer in the Wichita wellfield area to near pre-development conditions, recharge activities are being hampered by limited space within the aquifer for recharge activities to take place, leading to a proposal by Wichita for a new way to develop recharge credits.



The City of Wichita has proposed modifications to the conditions associated with Wichita's existing Phase II ASR permits. Included within the proposed modification request is the lowering of the minimum index levels used to determine when Wichita can withdraw accumulated recharge credits as well as authorization of new Aquifer Maintenance Credits (AMCs). AMCs would be accumulated during times of limited aquifer recharge capacity, where Wichita would receive recharge credits for treating surface water diverted at its ASR Project on the Little Arkansas River and sent directly to Wichita, offset by reduced Equus Bed Aquifer use. A public comment hearing took place on December 11, 2018, in Wichita, with a formal hearing to take place in March 2019.

State Water Plan Fund Revenue Estimate

State Water Plan Resource Estimate	FY2019 w/carry forward	FY2020 Recs Enhancement	FY2021 Recs Enhancement
Beginning Balance	\$2,198,161	\$522,563	\$207,838
Adjustments			
Release of Prior Year Encumbrance			
Other Service Charges	\$28,255	\$28,255	\$28,255
Transfers to SGF - John Redmond Bond	\$(1,260,426)	\$(1,260,426)	\$(1,260,426)
Subtotal--Adjustments	\$(1,232,171)	\$(1,232,171)	\$(1,232,171)
Revenues			
State General Fund Transfer	\$2,750,000	\$6,000,000	\$6,000,000
Economic Development Fund Transfer	\$500,000	\$2,000,000	\$2,000,000
Municipal Water Fees	\$3,267,271	\$3,267,271	\$3,267,271
Clean Drinking Water Fee Fund	\$2,820,674	\$2,710,279	\$2,820,674
Industrial Water Fees	\$1,120,701	\$1,065,021	\$1,120,701
Stock Water Fees	\$464,256	\$458,695	\$458,695
Pesticide Registration Fees	\$1,334,523	\$1,375,453	\$1,398,757
Fertilizer Registration Fees	\$3,568,921	\$3,584,360	\$3,625,319
Pollution Fines and Penalties	\$165,000	\$150,000	\$150,000
Sand Royalties	\$45,000	\$16,466	\$16,466
Total Receipts	\$16,036,346	\$20,627,545	\$20,857,883
Total Available	\$17,002,336	\$19,917,938	\$19,833,550
Less: Expenditures	\$16,479,773	\$19,710,100	\$19,829,970
Ending Balance	\$522,563	\$207,838	\$3,580

In 1989, an important step in current water planning was taken with the creation of the SWPF (K.S.A. 82a-951). The Fund is used for establishing and implementing water related programs or projects identified in the Kansas Water Plan. Revenue for the SWPF is received from fees assessed to municipal, industrial and agricultural water-related users and includes a demand transfer from the State General Fund and Economic Development Initiatives Fund as shown in the table.

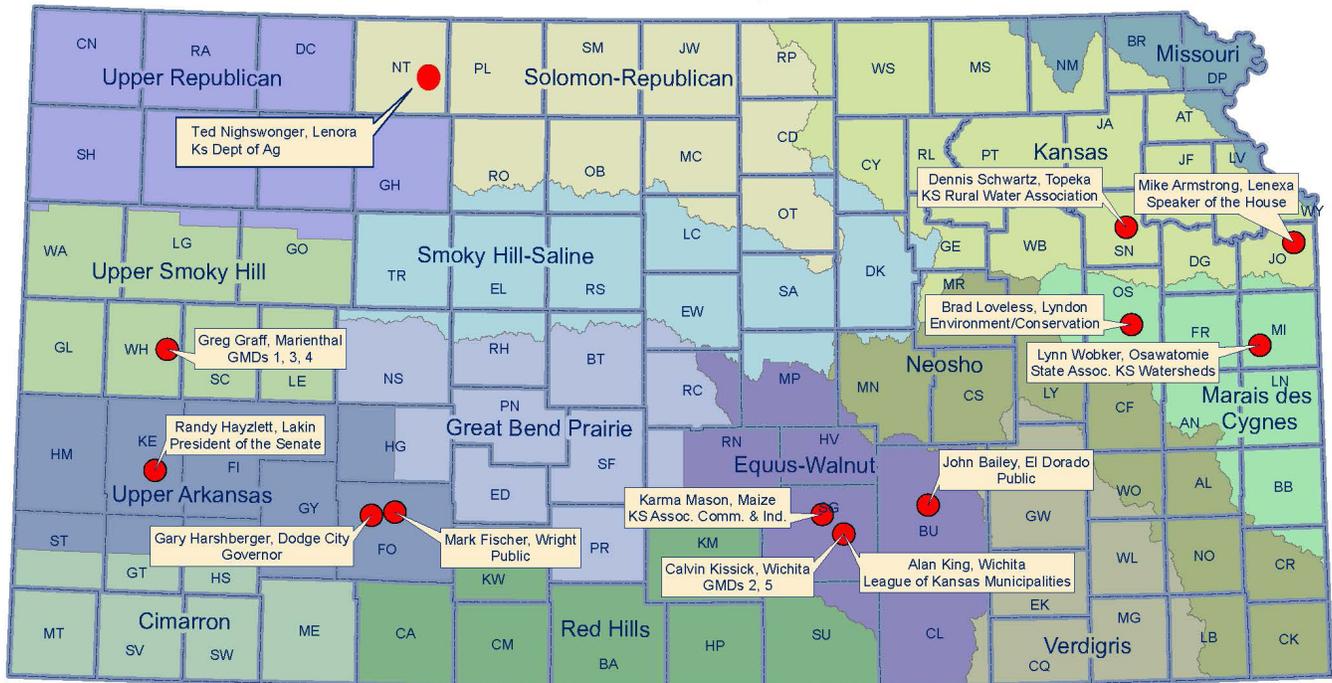
The fee structure that supports the State Water Plan Fund has remained virtually unchanged since the fund has been in place. Sand Royalty Receipts were added to the funding stream in FY1996 and the Clean Drinking Water Fee began in FY2008.

Source	Rate
Municipal Water Use	3 cents/1000 gal
Clean Drinking Water Fee	3 cents/1000 gal
Industrial Water Use	3 cents/1000 gal
Stockwater Use	3 cents/1000 gal
Pesticide Registration	\$100/ Registration
Fertilizer Inspections	\$1.40/ton
Pollution Fines and Penalties	Est. \$150,000
Sand Royalty Receipts	\$0.15 / ton
EDIF Transfer - Statutory	\$ 2,000,000
State General Fund Transfer	\$ 6,000,000

State Water Plan Fund Expenditure Recommendations

Agency/Program	FY2019 w/carry forward	FY2020 Recs Enhancement	FY2021 Recs Enhancement
Department of Health and Environment			
Contamination Remediation-1802	\$700,975	\$1,091,394	\$1,091,394
TMDL Initiatives-1805	\$284,281	\$278,029	\$278,029
Nonpoint Source Program-1804	\$313,703	\$303,208	\$303,208
Harmful Algae Bloom Pilot	\$450,000	\$450,000	\$450,000
Watershed Restoration and Protection Strategy	\$735,888	\$730,884	\$730,884
Drinking Water Protection		\$350,000	\$800,000
Total--Department of Health and Environment	\$2,484,847	\$3,203,515	\$3,653,515
University of Kansas--Geological Survey	\$26,841	\$26,841	\$26,841
Department of Agriculture			
Interstate Water Issues-0070	\$523,348	\$497,386	\$497,386
Subbasin Water Resources Management-80	\$619,692	\$619,692	\$619,692
Water Use-75	\$117,778	\$72,600	\$72,600
Water Resources Cost Share-1205	\$2,155,339	\$1,948,289	\$1,948,289
Nonpoint Source Pollution Asst.-1210	\$2,159,487	\$1,860,023	\$1,860,023
Aid to Conservation Districts-1220	\$2,092,637	\$2,092,637	\$2,092,637
Watershed Dam Construction-1240	\$551,373	\$550,000	\$550,000
Water Quality Buffer Initiative-1250	\$325,022	\$200,000	\$200,000
Riparian and Wetland Program-1260	\$525,146	\$154,024	\$154,024
Water Supply Restoration Program-1275	\$-	\$-	\$300,000
Water Transition Assistance Program/CREP	\$227,938	\$201,963	\$201,963
Real Time Water Management		\$125,000	\$125,000
Irrigation Technology	\$100,000	\$400,000	\$400,000
Crop and Livestock Research		\$250,000	\$250,000
Hemp Research	\$100,000	\$-	\$-
Sorghum Crop Research	\$150,000	\$-	\$-
Streambank Stabilization	\$500,000	\$500,000	\$500,000
Total--Department of Agriculture	\$10,147,760	\$9,471,614	\$9,771,614
Kansas Water Office			
Assessment and Evaluation	\$597,976	\$500,000	\$500,000
GIS Database Development	\$-	\$-	\$-
MOU - Storage Operations & Maintenance	\$350,000	\$410,000	\$523,000
Stream Gaging	\$431,282	\$423,130	\$430,000
Technical Assistance to Water Users	\$364,219	\$325,000	\$325,000
Vision Education Strategy	\$100,000	\$250,000	\$250,000
Reservoir and Water Quality Research		\$350,000	\$350,000
Water Tech Farms	\$75,000	\$250,000	\$250,000
Kansas Alluvial	\$50,000	\$-	\$-
Streambank Study	\$100,000	\$-	\$-
Bathymetric Study	\$200,000	\$-	\$-
Harmful Algae Bloom Study	\$100,000	\$-	\$-
Watershed Conservation Practice Imp	\$900,000	\$1,800,000	\$1,800,000
Equus Beds Chloride Plume Project	\$50,000	\$100,000	\$100,000
Milford Lake Watershed RCPP	\$400,000	\$600,000	\$-
Water Resource Planner	\$101,848	\$-	\$-
Streambank Stabilization	\$-	\$500,000	\$500,000
Water Injection Dredging		\$1,500,000	\$-
Storage Purchase		\$-	\$1,350,000
Total--Kansas Water Office	\$3,820,325	\$7,008,130	\$6,378,000
Total State Water Plan Expenditures	\$16,479,773	\$19,710,100	\$19,829,970

Kansas Water Authority Members



Kansas Water Office
January 2019

Kansas Water Authority Ex Officio Members

Division of Water Resources
KS Dept. of Agriculture

Ag Experiment Station
KS State University

Division of Conservation
KS Dept. of Agriculture

KS Geological Survey

KS Dept. of Wildlife, Parks & Tourism

KS Dept. of Commerce

KS Biological Survey

KS Dept. of Health & Environment

KS Dept. of Agriculture-Secretary

Kansas Water Office

KS Corporation Commission

The Kansas Water Authority (KWA) consists of 13 voting members who are appointed by the Governor or Legislative Leadership. State agency directors serve as ex-officio members. KWA is statutorily within and part of the Kansas Water Office (KWO). The KWA is responsible for advising the Governor, Legislature and Director of the KWO on water policy issues and for approving the Kansas Water Plan, federal contracts, administration and regulations proposed by the KWO. The KWA provides the leadership to ensure that water policies and programs address the needs of all Kansans.

Kansans act on a shared commitment to have the water resources necessary to support the state's social, economic and natural resource needs for current and future generations.

- The Long Term Vision for the Future of Water Supply In Kansas



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