

# Kansas Water Authority

## In-Person & Virtual Meeting June 22, 2022

### *Options For Audio:*

- **Use Computer Audio via Zoom**  
**or**
- **Use your phone:**

Dial: (346) 248-7799

Meeting ID: 839 6307 5451

Passcode: 394400



# MEETING AGENDA

<i>Time</i>	<i>Agenda Item</i>	<i>Presenter</i>	<i>KWA Advice</i>	<i>KWA Decision</i>	<i>Page No.</i>
9:00 am	<b>Call to Order/Roll Call</b>	Dawn Buehler	--	--	--
9:05 am	<b>Approval of Meeting Minutes</b>				
	April 20, 2022 Meeting	Dawn Buehler		X	2
9:10 am	<b>Welcome to Pittsburg/Pittsburg Water Update</b>	Jay Byers			
9:20 am	<b>KWA Public Water Supply Committee Update</b>	John Bailey			5
	Water Marketing Variable Rate			X	5-6
9:50 am	<b>KWA RAC Operations Committee</b>	Jeremiah Hobbs			--
	<i>*Materials with recommended KWA to be provided following KWA RAC Operations Committee Meeting*</i>			X	
10:00 am	<b>Legislative Update</b>	Matt Unruh			
	2022 Kansas Legislature Wrap Up		X		7-8
10:15 am	<b>KWA Summer Water Policy Discussion Update</b>	Dawn Buehler	X		--
10:30 am	<b>BREAK</b>				
10:45 am	<b>Federal Update</b>				--
	USGS Federal Cooperative Agreements	Josh Olson		X	9-10
	Tuttle Creek Water Injection Dredging Demonstration	Josh Olson	X		11
11:15 am	<b>Kansas/Colorado Arkansas River Quality Summit Update</b>	Tom Stiles	X		--
11:35 am	<b>Dealing with Nitrates in Kansas</b>	Tom Stiles Travis Sieve	X		--
12:00 pm	<b>LUNCH</b>				
12:45 pm	<b>Kansas Water Success Stories: KDA-DWR</b>	Earl Lewis	X		--
1:05 pm	<b>Kansas Dam Safety Update</b>	Earl Lewis	X		--
1:35 pm	<b>KWA Open Discussion</b>	Dawn Buehler	X		--
1:55 pm	<b>KWA Ex Officio Agency Updates</b>	Dawn Buehler	X		--
2:25 pm	<b>Director's Report</b>	Connie Owen	X		--
2:35 pm	<b>New Business</b>				
2:45 pm	<b>Adjourn</b>				

# Call to Order/Roll Call

Call to Order/Roll Call; *Dawn Buehler*

# Minutes

Presented by: Dawn Buehler



Action Needed

Approval of minutes from:  
January 27, 2022



# WELCOME TO PITTSBURG



Presented by: Jay Byers  
Pittsburg Deputy City Manager/Chief Information Officer  
Neosho RAC Member

# KWA Public Water Supply Committee

Presented by: John Bailey & Nathan Westrup



## Action Needed

- CY 2023 Water Marketing Program rate setting

# KWA PWS Committee Meeting

## June 6, 2022

Items proposed for action:

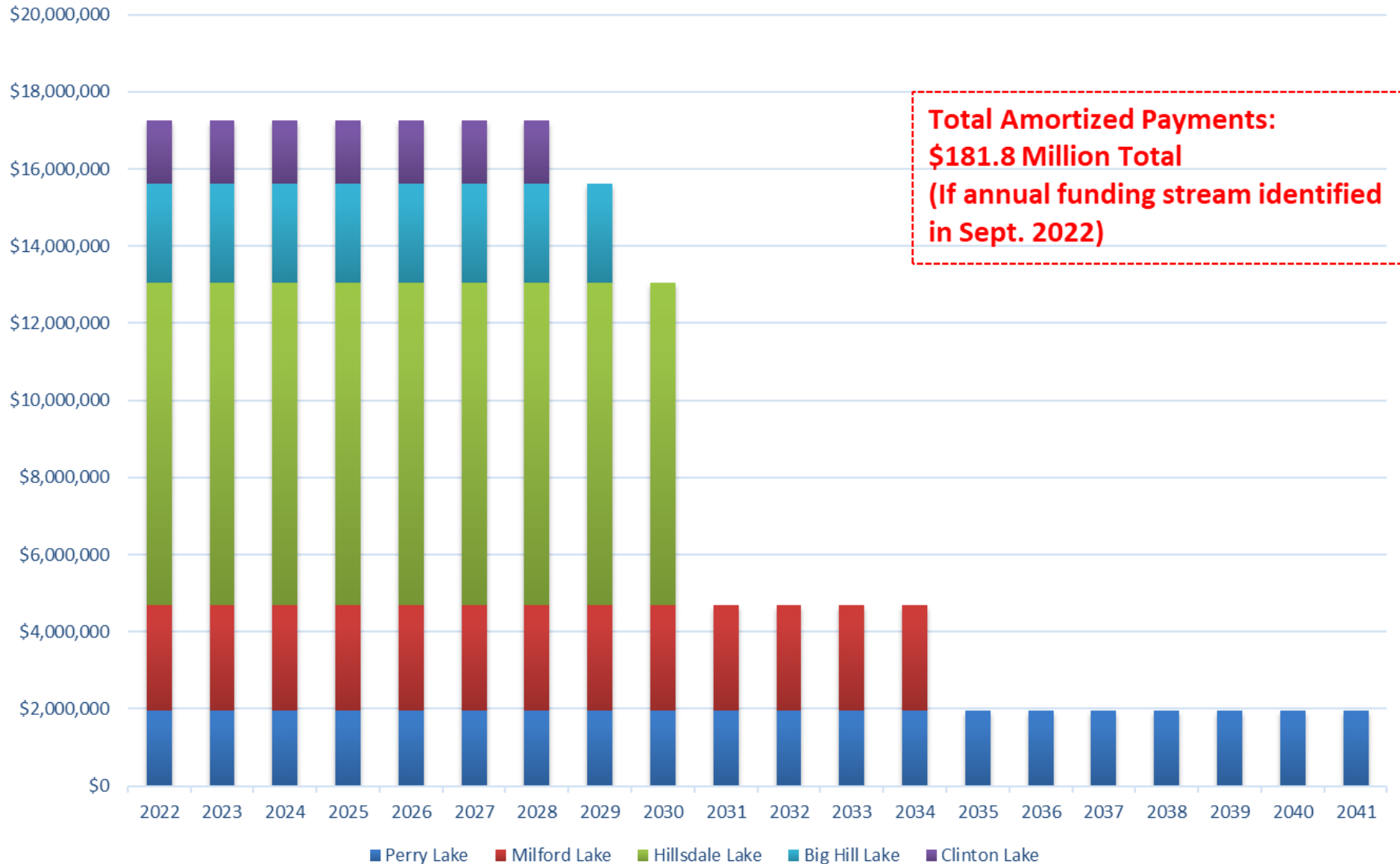
- Recommend CY 2023 Water Marketing Program rate

### Agenda:

1. Legislative session and contributions from the SGF toward reservoir debt obligations
2. CY 2023 Water Marketing Program rate per 1,000 gallons (action)
3. Negotiations of the City of Independence water purchase contract (status)
4. Water Purchase Contract No. 17-2, amendment negotiations (status)
5. Additional discussion items

# Capital Investment Obligation to Corps of Engineers - "Unfunded Liabilities"

(Amortized Payments Per Contract Terms)



# Legislative Session and SGF Funding

## House Substitute for Substitute for SENATE BILL No. 267

Sec. 131.

### KANSAS WATER OFFICE

(a) There is appropriated for the above agency from the state general fund for the fiscal year ending June 30, 2022, the following:

Water resources operating expenditures.....\$80,024,061

*Provided*, That expenditures of \$80,000,000 shall be made from this account for fiscal year 2022 for the payment of water supply storage debt for Big Hill, Clinton and Hillsdale reservoirs.

fund for the purchase of vessel liability insurance: *Provided further*, That, notwithstanding any provision of the state water plan storage act, K.S.A. 82a-1301 through 82a-1320, and amendments thereto, or any other statute, expenditures shall be made from the water marketing fund from moneys previously obligated for the payment of water supply storage debt for Big Hill, Clinton and Hillsdale reservoirs for fiscal year 2023 for payment of water supply storage debt for all other reservoirs for fiscal year 2023.

General fees fund (709-00-2022-2000).....No limit

# Legislative Session and SGF Funding

Sec. 17.

## DEPARTMENT OF ADMINISTRATION

(a) There is appropriated for the above agency from the state general fund for the fiscal year ending June 30, 2022, the following:

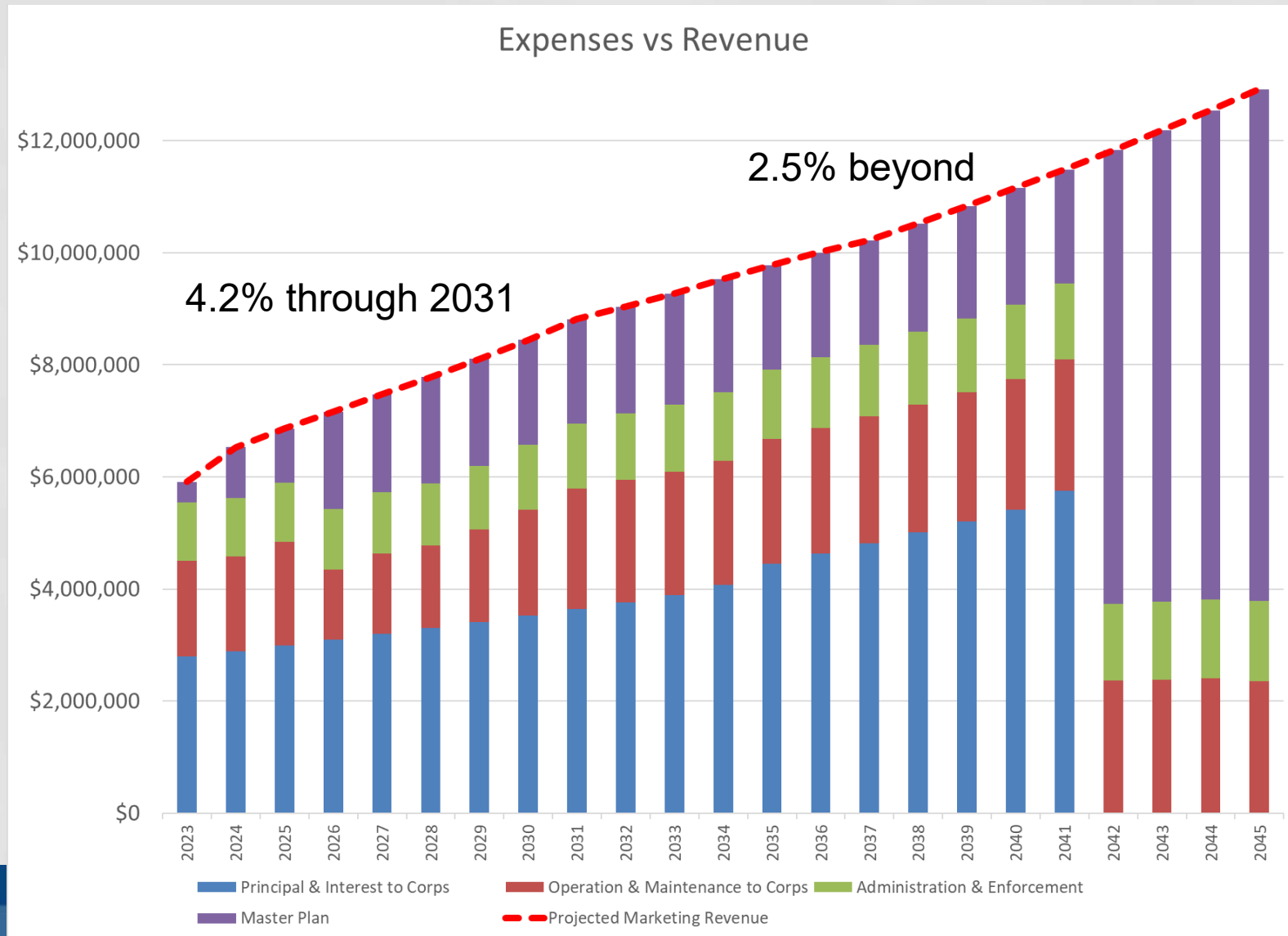
Debt service refunding –

2015A (173-00-1000-0463).....\$160,460,850

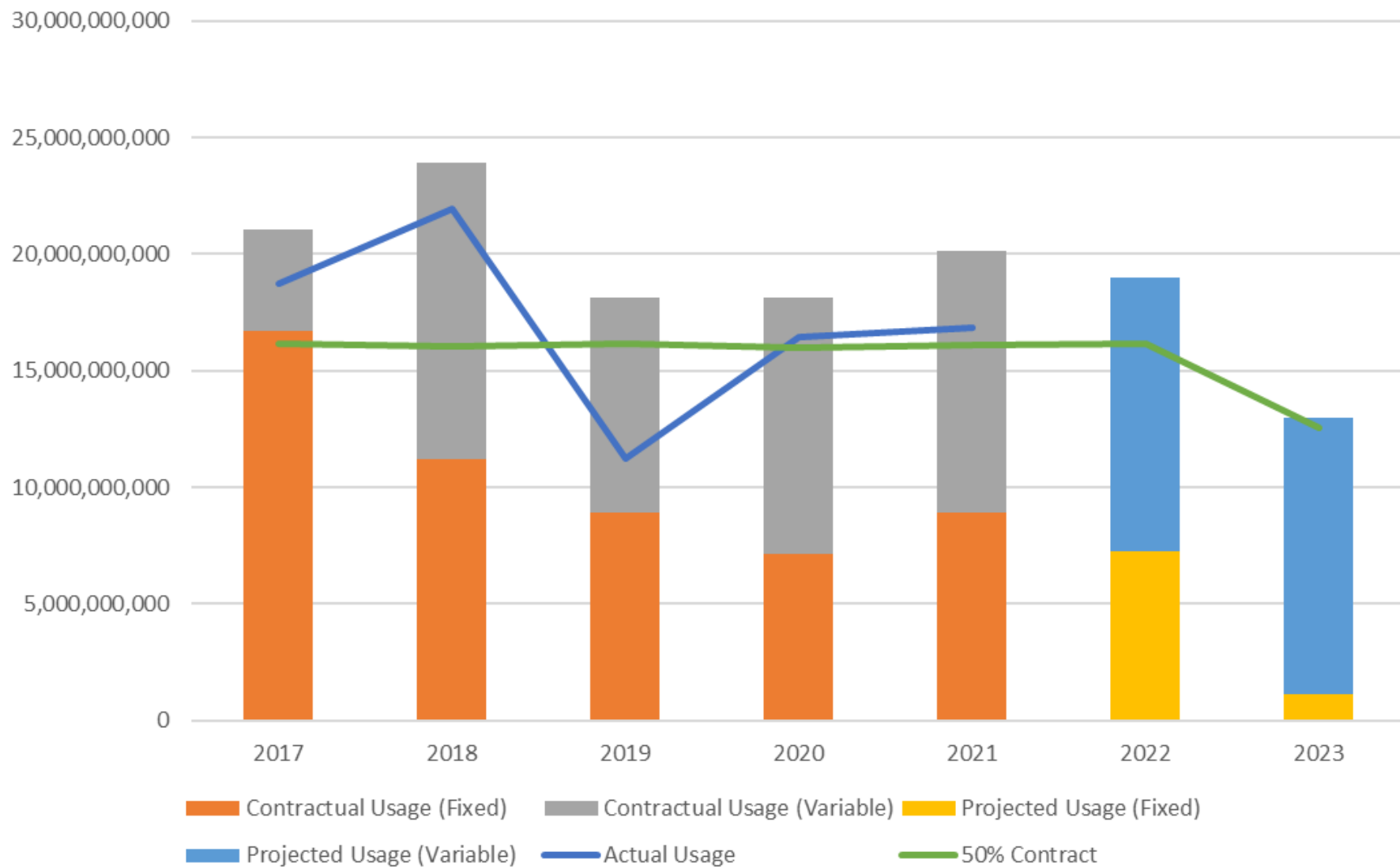
*Provided*, That expenditures from the debt service refunding – 2015A account shall be made by the above agency solely for the purposes of debt service payments and legally defeasing or cash redeeming the 2015A state of Kansas projects revenue bonds redeeming at their first optional redemption date of May 1, 2023.

- The 2015A bonds included the John Redmond dredging project.
  - Marketing annual payment: \$414,324 (through 2030)
  - SWPF annual payment: \$1,260,426

# Revenue vs Expenses (Long-term)

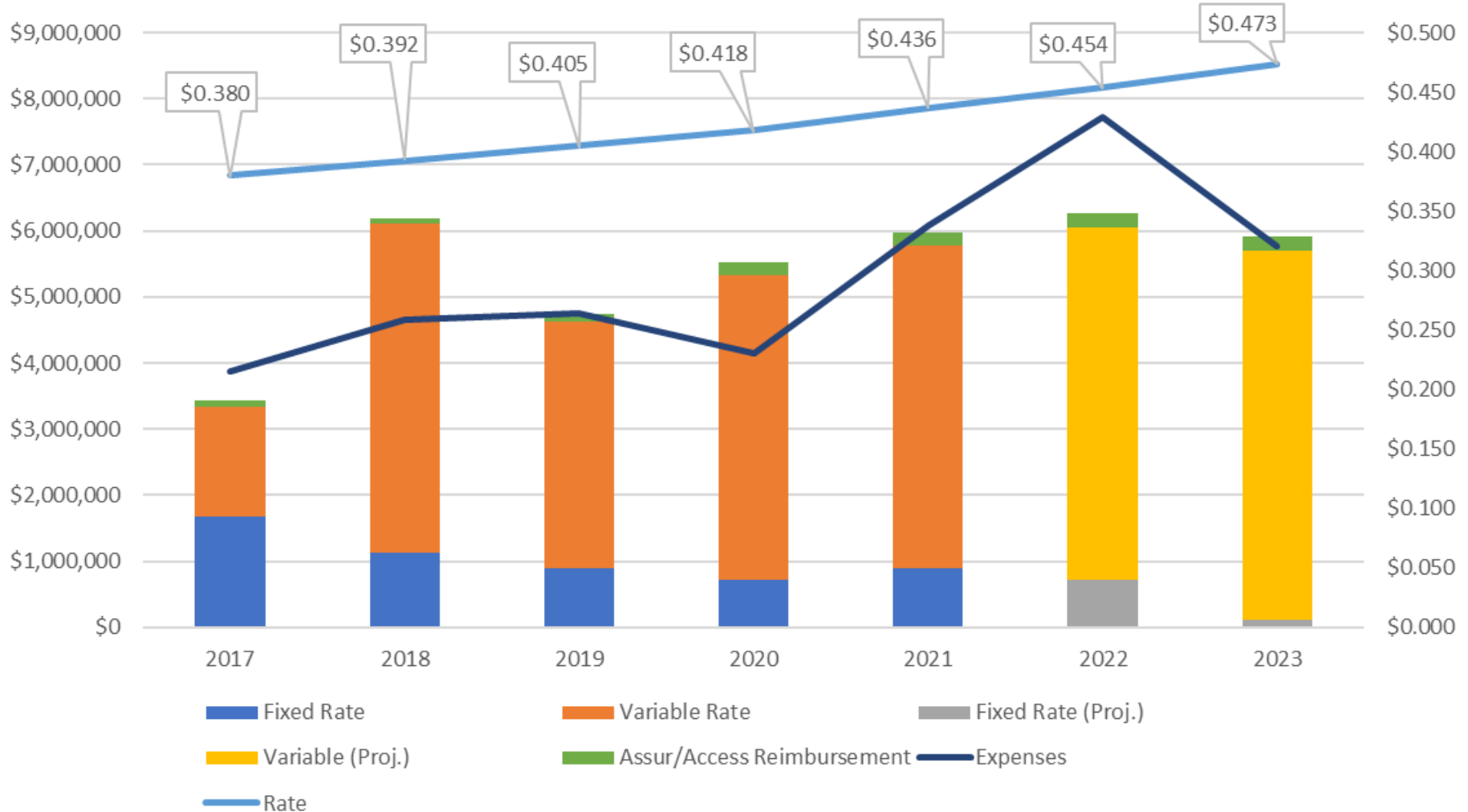


## Water Volume: Sales/Usage





## Revenue vs Expenses / Rate



# Statutory Rate Components

- An amount necessary to repay capital costs
- An amount as interest on money advanced from the State General Fund (not an active component)
- Administration and enforcement expenses
- Operation, maintenance, and repair costs
- An amount necessary to meet the needs of the program as shown in the *Water Marketing Program Capital Development and Storage Maintenance Plan* approved by the Kansas Water Authority

# Additional Statutory Requirements

- The rate fixed by the Director shall be approved by the KWA on or before July 15 of each calendar year
- The rate shall take effect on January 1 of the following year
- The Director shall consider the state's conservation water supply capacity from all sources as though impounded in one single reservoir

# Other Rate Considerations

- Impact to customers
- Progress toward goals set in Capital Development and Storage Maintenance Plan
- Future expense obligations

# Water Marketing Rate, CY2023

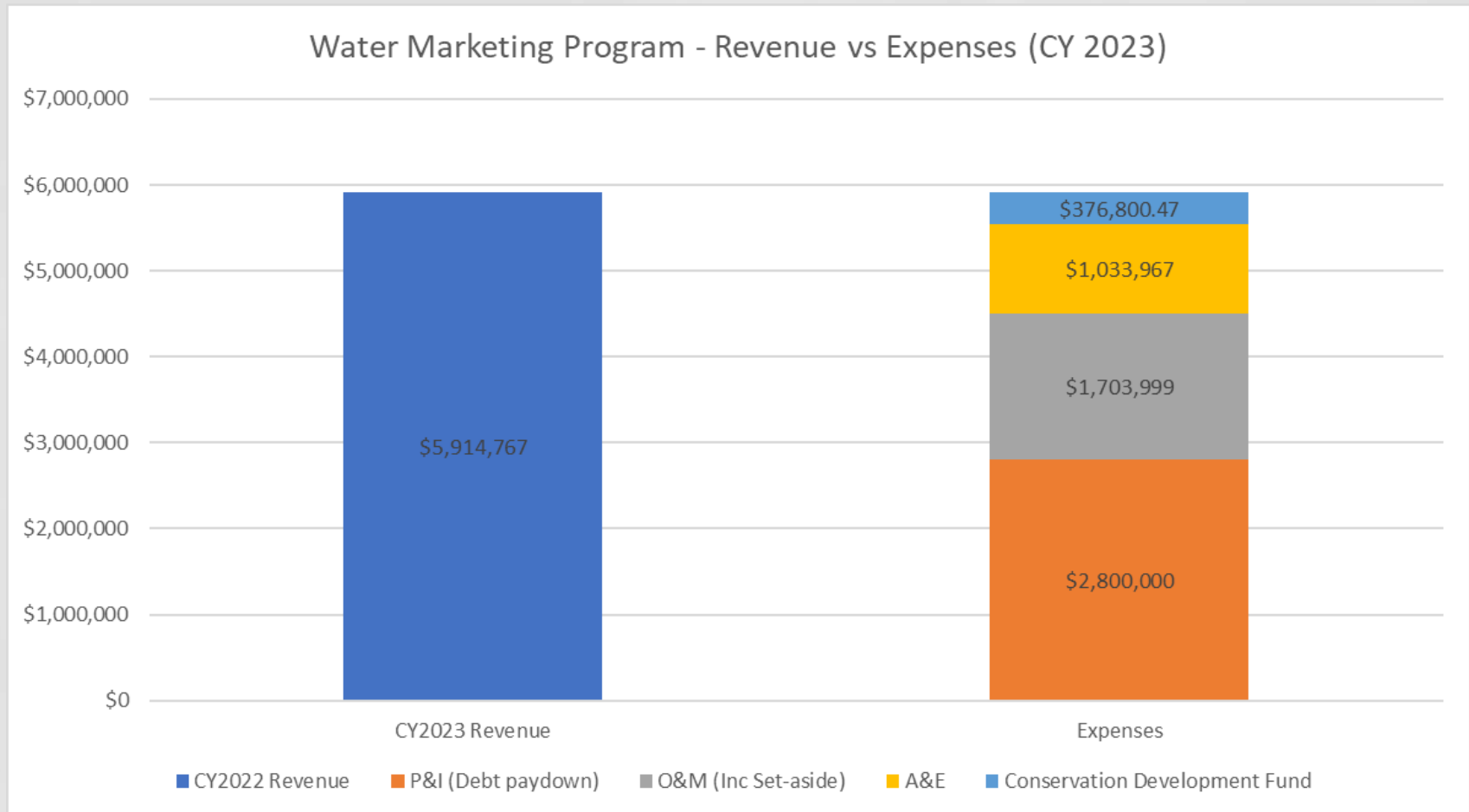
## • Expenses

- Capital costs to USACE, principle and interest
  - Service debt for future use storage at Milford & Perry
  - All in-service storage is paid off
  - Conservation development fund (Policy, according to Capital Development Plan)
- Administration & Enforcement (A&E)
- Operations and Maintenance
  - Routine O&M
  - Major repair
  - O&M set aside fund (\$0.01 per 1,000 gal)
- Protection and Restoration
  - Investment in reservoir sustainability
  - Conservation development fund (Policy)

## • Revenue

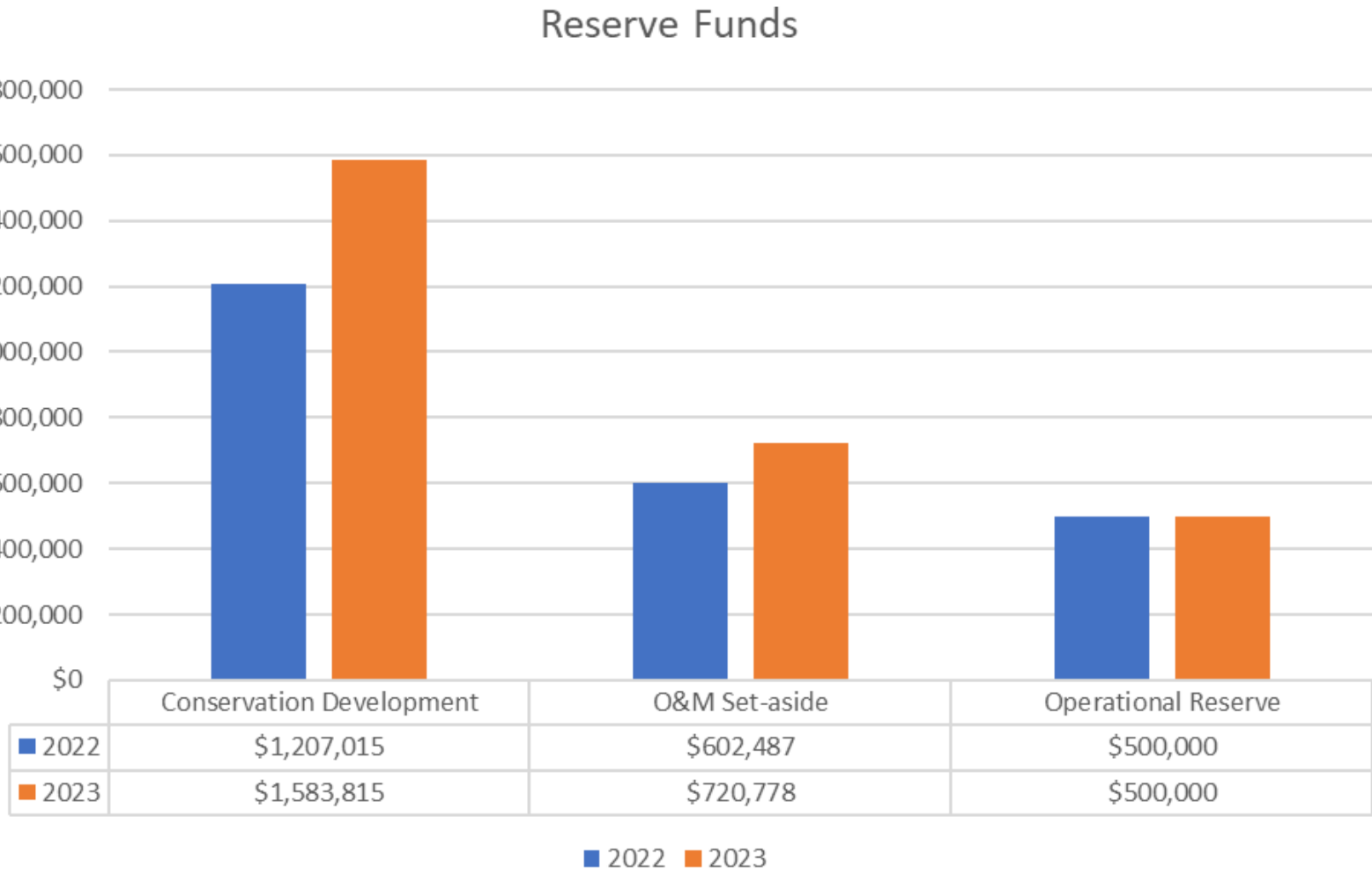
- Water sales (primary)
- Assurance/Access District A&E reimbursement

# Revenue vs Expenses (Rate \$0.473)

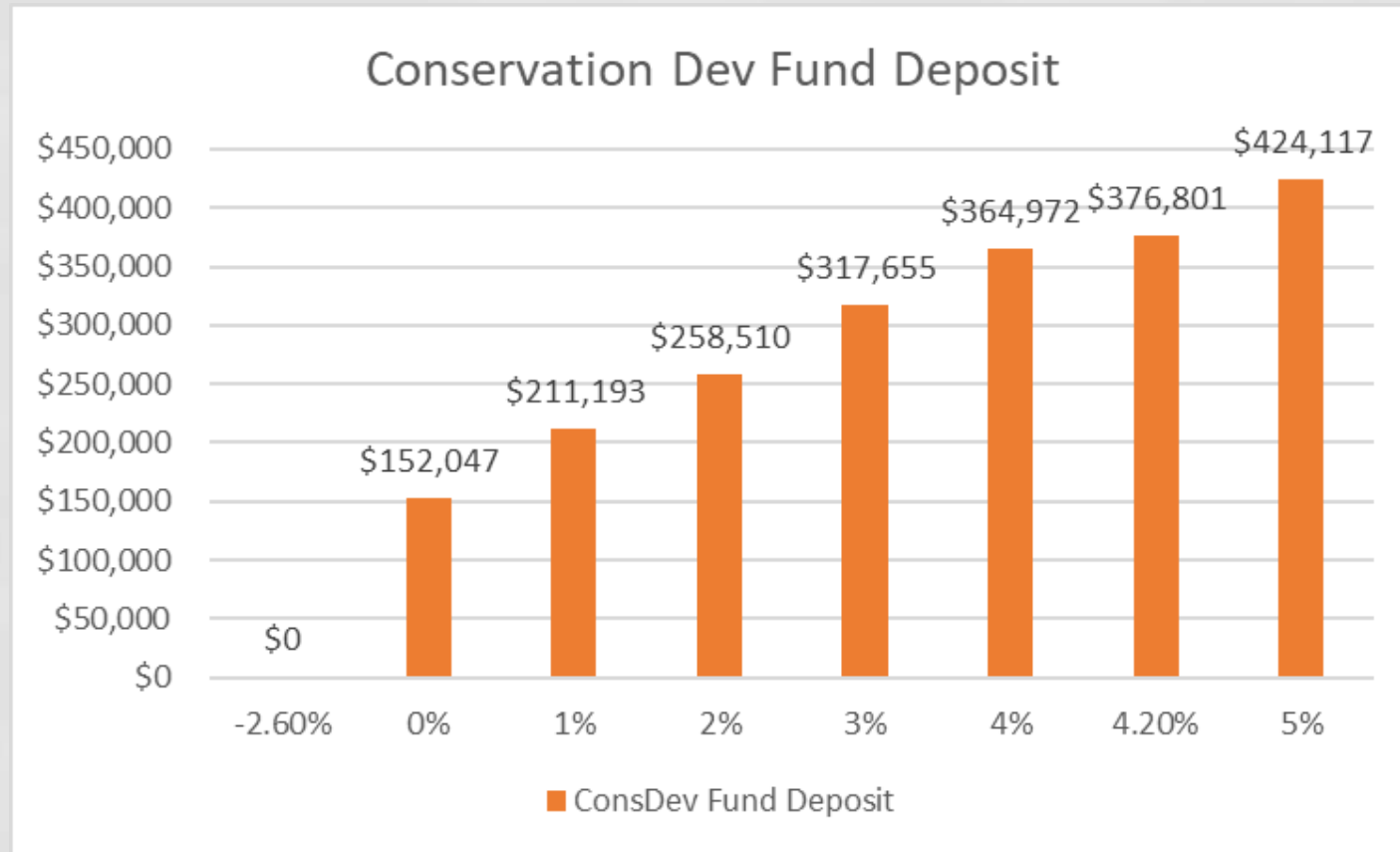


Calendar Year	2018	2019	2020	2021	2022	2023
Variable Rate	\$0.392	\$0.405	\$0.418	\$0.436	\$0.454	\$0.473
% Increase	3.2%	3.2%	3.2%	4.2%	4.2%	4.2%

# Reserve Fund Balances



# Alternative Rate Scenarios



Calendar Year	2023	2023	2023	2023	2023	2023	2023	2023
Rate Range	\$0.442	\$0.454	\$0.459	\$0.463	\$0.468	\$0.472	\$0.473	\$0.477
% Increase	-2.60%	0%	1%	2%	3%	4%	4.20%	5%
Cons Development	\$0	\$152,047	\$211,193	\$258,510	\$317,655	\$364,972	\$376,801	\$424,117



# Recommended Rate

- The PWS Committee recommends that the Kansas Water Authority set the CY 2023 Water Marketing variable rate at \$0.473/1000 gallons

Calendar Year	2023	2023	2023	2023	2023	2023	2023	2023
Rate Range	\$0.442	\$0.454	\$0.459	\$0.463	\$0.468	\$0.472	\$0.473	\$0.477
% Increase	-2.60%	0%	1%	2%	3%	4%	4.20%	5%
Cons Development	\$0	\$152,047	\$211,193	\$258,510	\$317,655	\$364,972	\$376,801	\$424,117

# Contract Negotiations Update

- City of Independence

- Contract negotiations are complete
  - City Commission approved the negotiated contract on June 9<sup>th</sup>
  - Action on contract, August KWA meeting

- Everygy – Wolf Creek

- New thermal analysis has been completed and is being reviewed internally
- After new thermal data is provided to KWO, KWO will update OASIS model
- Water Purchase Contract No. 17-2 term amendment is needed prior to December 31, 2022

# KWA RAC Operations Committee

Presented by: Jeremiah Hobbs & Angela Anderson



## Action Needed

- RAC Membership

MEMO



DATE: June 20, 2022  
TO: Kansas Water Authority  
FROM: Jeremiah Hobbs, RAC Operations Committee Chair  
RE: RAC membership

900 SW Jackson Street  
Topeka, KS 66612  
Phone: (785) 296-3185  
Fax: (785) 296-0878  
www.kwo.ks.gov

The KWA Regional Advisory Committee (RAC) Operations Committee met June 20, 2022, via GoTo Meeting. Discussion during the conference call focused on the following topics:

- Membership application for the Solomon-Republican Regional Advisory Committee.

The Committee reviewed and discussed the applications of: Amanda Johnson from Glasco for membership on the Solomon-Republican RAC. The following membership recommendations were approved by the RAC Operations Committee:

- Recommend current member, Stanley Kats, be moved from *At-Large Public 3* to the vacant *Irrigation, West* position, with a term expiration of June 2025.
- Recommend changing the *At-Large Public 4* position to be changed to *Conservation/Environment 2* and all At-Large Public position numbers be changed accordingly, except *At-Large Public (cc)*.
- Recommend Amanda Johnson be considered for the *Conservation/Environment 2* category with a term expiration of June 2023.

*The KWA RAC Operations Committee recommends KWA approval of the position shifts, renaming and the application for membership on the Solomon-Republican RAC as indicated above.*

# Legislative Update

Presented by: Matt Unruh

## MEMO

DATE: June 16, 2022  
TO: Kansas Water Authority  
FROM: Matt Unruh  
RE: 2022 Legislative Session Update



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### State Water Plan Fund (SWPF) FY 2022 & FY 2023 Appropriations

The table provided on the following page includes the FY 2022 and FY 2023 SWPF appropriations. The FY 2023 SWPF appropriations include expenditures reflecting full statutory State General Fund (SGF) and Economic Initiatives Development Fund (EDIF) demand transfers of \$6 million and \$2 million, respectively, to the SWPF. The full \$8 million statutory demand transfer was also included within the Governor's FY 2023 budget recommendations and represents the first time since FY 2008 in which this full amount was approved.

The Legislature also approved the addition of \$150,000, all from the SWPF, for the Tuttle Creek Lake water injection dredging (WID) demonstration. This addition brings the total state appropriation for the project to up \$2.0 million and has allowed the Kansas Water Office along with the U.S. Army Corps of Engineers to advance demonstration planning efforts.

### Reservoir Water Supply Storage Debt Payments

\$80.0 million of State General Fund (SGF) was appropriated to the Kansas Water Office within House Substitute for Substitute for Senate Bill 267 (House Sub. for Sub. for SB 267) for the purpose of paying off capital expenses for water supply storage within Big Hill Lake, Clinton Lake, and Hillsdale Lake during FY 2022. Included within this bill was additional language regarding the dedication of revenue streams which would have been previously utilized for capital expenses on those three reservoirs to be utilized on retirement of storage debt in the future. These payments were made to the U.S. Army Corps of Engineers in late May.

Also of note, but not specifically tied to the previously mentioned water supply storage payments within House Sub. for Sub. for SB 267, was the approved FY 2023 revenue adjustment which transfers \$50,000 SGF to the Water Structures Emergency Fund.

### John Redmond Dredging Project Bond Payment

House Bill 2510, which included \$332.2 million SGF for the early payoff of Series 2015A and 2015G bonds, was passed and ultimately enrolled into law effective June 2, 2022. The Series 2015A bonds include the John Redmond Reservoir dredging project bond which was issued to support design, permitting, construction, dredging and reclamation work as well as additional streambank stabilization on the Cottonwood River. Remaining bond debt will be paid off before the end of FY 2022.

### Substitute for House Bill 2686

After much discussion over the past two years, the House Water Committee ultimately passed Substitute for House Bill 2686 (Sub. for HB 2686), which would amend the Kansas Groundwater Management District Act to require groundwater management districts (GMDs) to provide certain reports to the Legislature. The bill would also distribute a portion of retailers' sales tax and compensating use tax revenue to the State Water Plan Fund each year. Sub. for HB 2686 did not advance to the House floor, thus dying on the calendar with adjournment of the Legislature.

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*This is for informational purposes only. No Kansas Water Authority action is necessary at this time.*

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EXPENDITURES	FY 2021 Actuals	FY 2022 Approved	FY2023 Approved
<b>Department of Health and Environment</b>			
Contamination Remediation	\$ 1,089,869	\$ 1,088,772	\$ 1,088,301
Nonpoint Source Program	\$ 393,118	\$ 316,247	\$ 403,208
TMDL Initiatives	\$ 275,574	\$ 345,232	\$ 380,738
Harmful Algae Bloom Pilot	\$ 326,697	\$ 1,272,064	\$ 150,000
Watershed Restoration/Protection (WRAPS)	\$ 752,127	\$ 730,884	\$ 1,000,000
Drinking Water Protection Program	\$ 264,346	\$ 350,000	\$ 800,000
<b>SUBTOTAL--KDHE</b>	<b>\$ 3,101,731</b>	<b>\$ 4,103,199</b>	<b>\$ 3,822,247</b>
State Employee Pay Plan			\$ 30,314
<b>Department of Agriculture</b>			
Interstate Water Issues	\$ 435,436	\$ 722,886	499,481
Subbasin Water Resources Management	\$ 443,342	\$ 979,587	621,651
Water Use	\$ 65,908	\$ 143,531	100,000
Water Resources Cost Share	\$ 2,404,488	\$ 2,475,044	2,698,289
Nonpoint Source Pollution Asst.	\$ 2,002,236	\$ 1,978,238	1,860,104
Aid to Conservation Districts	\$ 2,192,637	\$ 2,223,373	2,473,373
Watershed Dam Construction	\$ 411,715	\$ 688,285	550,000
Water Quality Buffer Initiative	\$ 192,855	\$ 436,599	200,000
Riparian and Wetland Program	\$ 80,479	\$ 555,840	154,024
Water Transition Assistance Program/CREP	\$ 132,709	\$ 768,820	546,593
Irrigation Technology	\$ 76,178	\$ 325,046	350,000
Crop and Livestock Research	\$ 350,000	\$ 250,000	250,000
Soil Health - NEW		\$ -	100,000
Streambank Stabilization	\$ 1,196,678	\$ 918,286	750,000
<b>SUBTOTAL--KDA</b>	<b>\$ 10,754,576</b>	<b>\$ 12,465,535</b>	<b>11,153,515</b>
State Employee Pay Plan			45,145
<b>Kansas Water Office</b>			
Assessment and Evaluation	\$ 491,110	\$ 812,287	834,078
MOU - Storage Operations & Maintenance	\$ 582,408	\$ 578,862	530,464
Stream Gaging	\$ 413,580	\$ 423,130	413,580
Technical Assistance to Water Users	\$ 325,000	\$ 341,391	325,000
Vision Education Strategy	\$ 225	\$ 224,775	250,000
Reservoir and Water Quality Research	\$ 266,027	\$ 486,277	350,000
Water Technology Farms	\$ 4,125	\$ 175,000	200,000
Watershed Conservation Practice Imp (KRPI)	\$ -	\$ 550,000	1,000,000
Equus Beds Chloride Plume Project	\$ -	\$ -	50,000
Milford Lake Watershed RCPP	\$ 20,000	\$ 580,000	50,000
Water Injection Dredging (WID)	\$ -	\$ 975,000	1,025,000
Arbuckle Study	\$ 61,700	\$ 60,000	150,000
Flood Response Study	\$ -	\$ -	200,000
<b>SUBTOTAL--KWO</b>	<b>\$ 2,164,175</b>	<b>\$ 5,206,722</b>	<b>5,378,122</b>
<b>Department of Wildlife &amp; Parks</b>			
Aquatic Nuisance Species (ANS) Program	\$ -	\$ -	224,457
<b>University of Kansas--Geological Survey</b>	<b>\$ 26,841</b>	<b>\$ 26,841</b>	<b>26,841</b>
<b>Total State Water Plan Expenditures</b>	<b>\$ 16,047,323</b>	<b>\$ 21,802,297</b>	<b>\$ 20,680,641</b>

# Kansas Water Authority Summer Water Policy Discussion Update

Presented by: Dawn Buehler



**SCHEDULED BREAK**

**Meeting will resume soon**

# Federal Update

- USGS Federal Cooperative Agreements
- Water Injection Dredging (WID) Demonstration at Tuttle Creek Lake

Presented by: Josh Olson



## Action Needed

- SFY 2023 USGS Cooperative Agreements

# Federal Update – USGS Federal Cooperative Agreements

Presented by: Josh Olson



# Streamgaging

- Near real-time, continuous monitoring of stream and river conditions throughout the state
- Flow monitoring at 59 surface water and 3 ground water stations
- Data posted and updated online through the USGS National Water Information System
- Expected KWO contribution for SFY23 is \$413,580



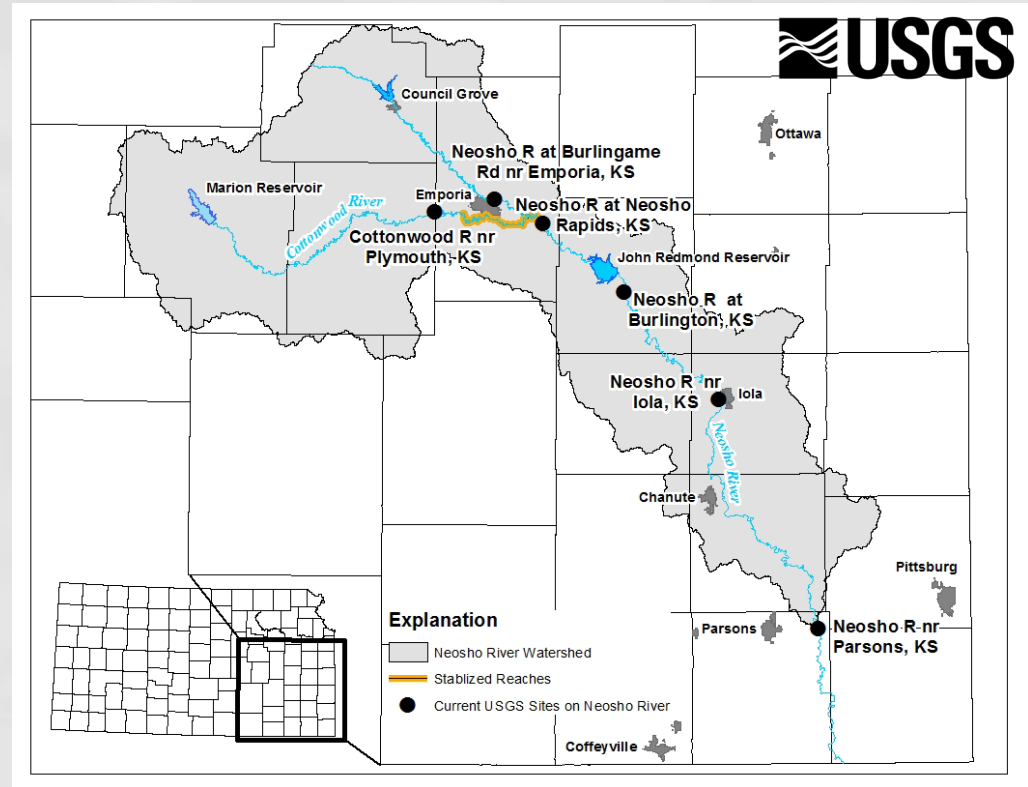
# Kansas River Water Quality Monitoring

- Real-time monitoring and notification of changing water-quality conditions
  - Nutrients, sediment, bacteria, cyanobacteria
- Continuous water quality monitoring and discrete sample collection on the Kansas River at Wamego, Topeka, and De Soto
- Current and past partners have included KDHE, The Nature Conservancy, WaterOne, Topeka, Olathe, Manhattan, Lawrence, De Soto, Evergy
- Expected KWO contribution for SFY23 is \$30,000



# Neosho River Sediment Monitoring

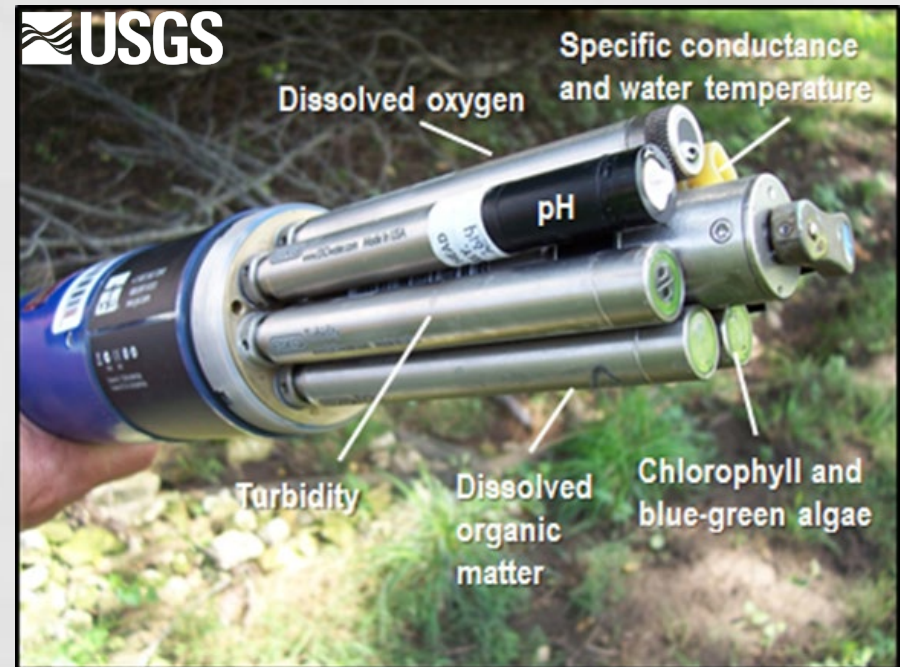
- Monitoring of turbidity conditions upstream and downstream of John Redmond Reservoir
- Evaluate sediment load and trapping efficiency
- USGS Scientific Investigations Report: Sediment Flux from Upstream and Through John Redmond Reservoir, East-Central Kansas, 2010–19
- Expected KWO contribution for SFY23 is \$51,400





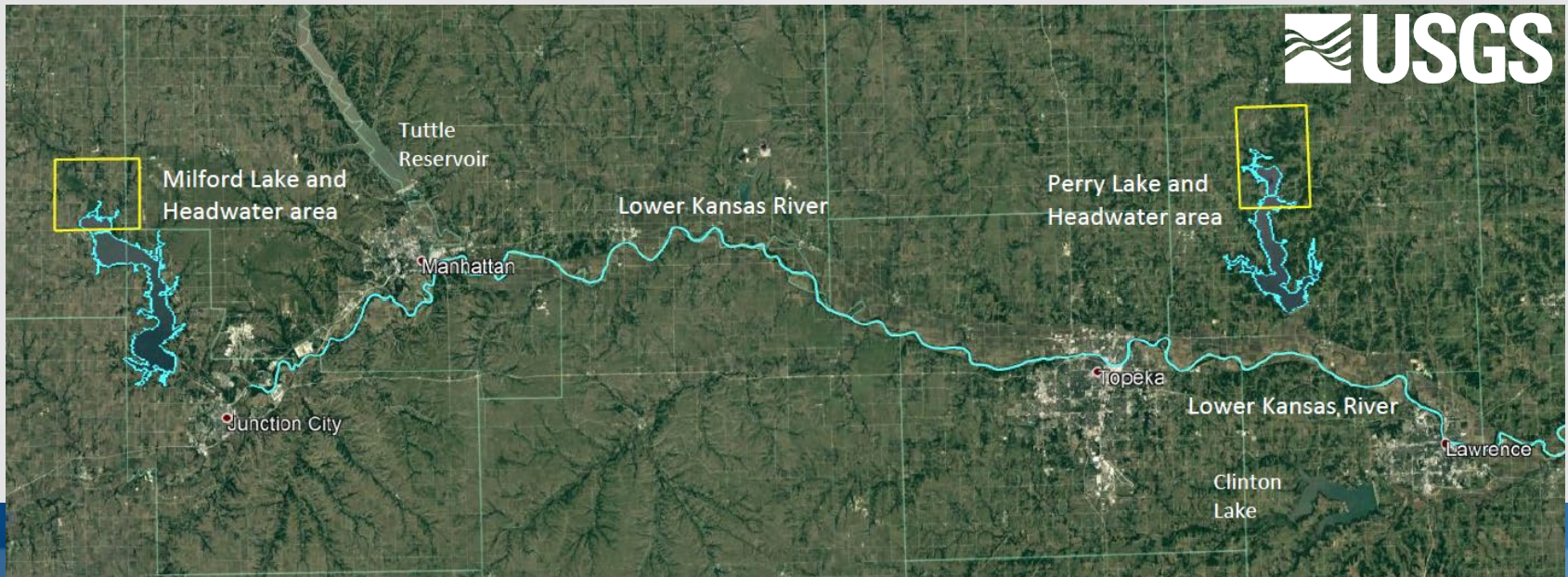
# Republican River at Clay Center Monitoring

- Characterize sediment, nutrients, and water quality conditions entering Milford Lake
- Continuous water quality monitoring and discrete sediment and nutrient sampling at Republican River at Clay Center, KS (06856600)
- Supports monitoring associated with Milford RCPP project
- USGS Scientific Investigations Report to be completed in SFY23
- Expected KWO contribution for SFY23 is \$83,500



# HABs in Rivers Study

- Occurrence of HABs and algal toxins in slow-moving streams, wetlands, and oxbows and downstream impacts on reservoirs and large rivers
- Focus on Perry and Milford Reservoirs and the floodplain of the lower Kansas River
- Evaluate use of satellite imagery for identifying and monitoring HABs and algal toxins
- 3-year study; expected KWO contribution for SFY23 (Year 2) is \$21,400



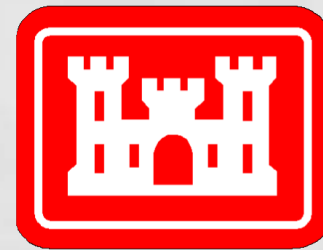


# Proposed Action Today:

- *The Kansas Water Office recommends the KWA give approval to the Director to enter into agreements with the U.S. Geological Survey for the Streamgaging Network, Kansas River Water Quality Monitoring, Neosho River Sediment Monitoring, Monitoring on Republican River at Clay Center above Milford Lake, and HABs in Rivers Study.*

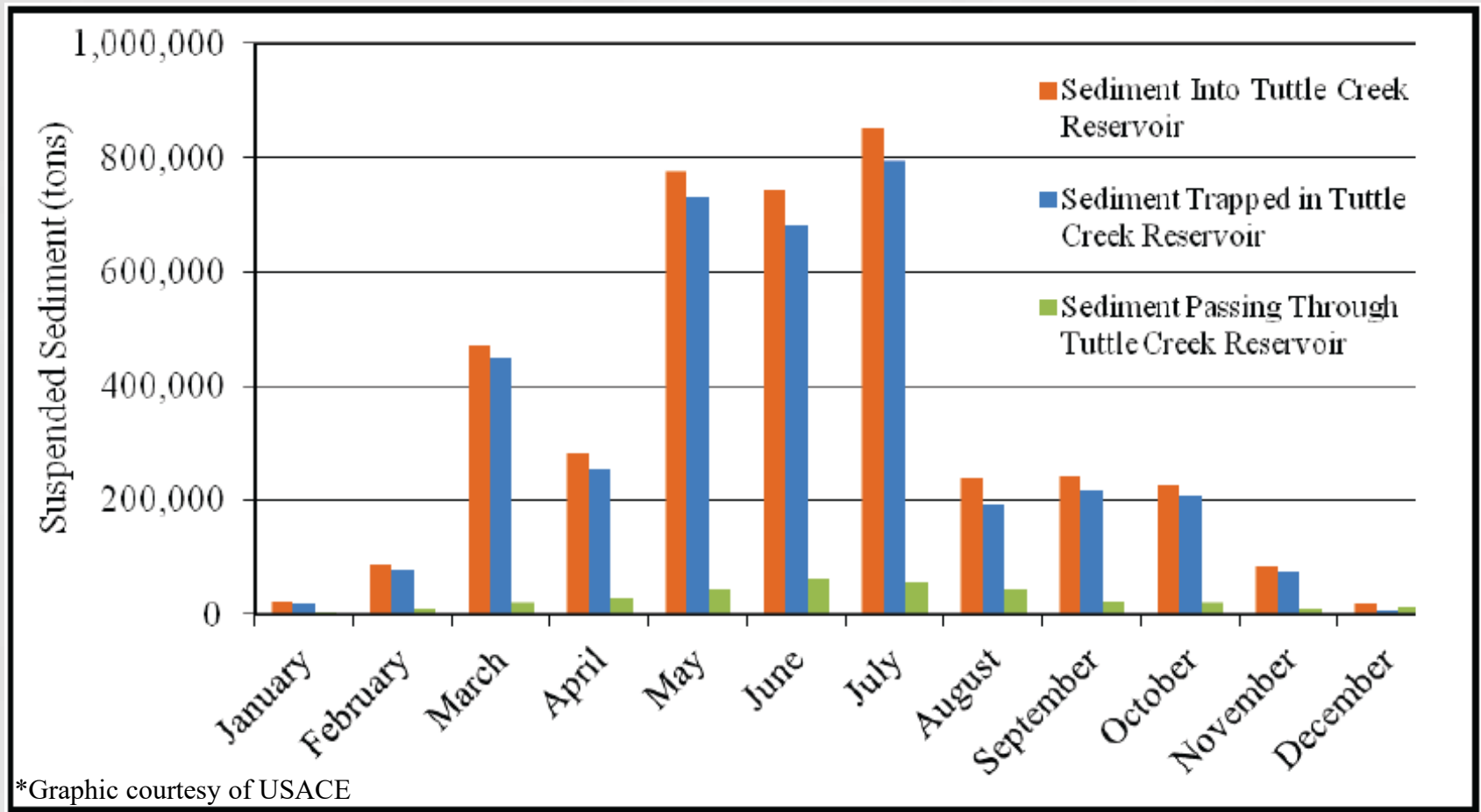
# Federal Update - Water Injection Dredging (WID) Demonstration at Tuttle Creek Lake

Presented by: Josh Olson



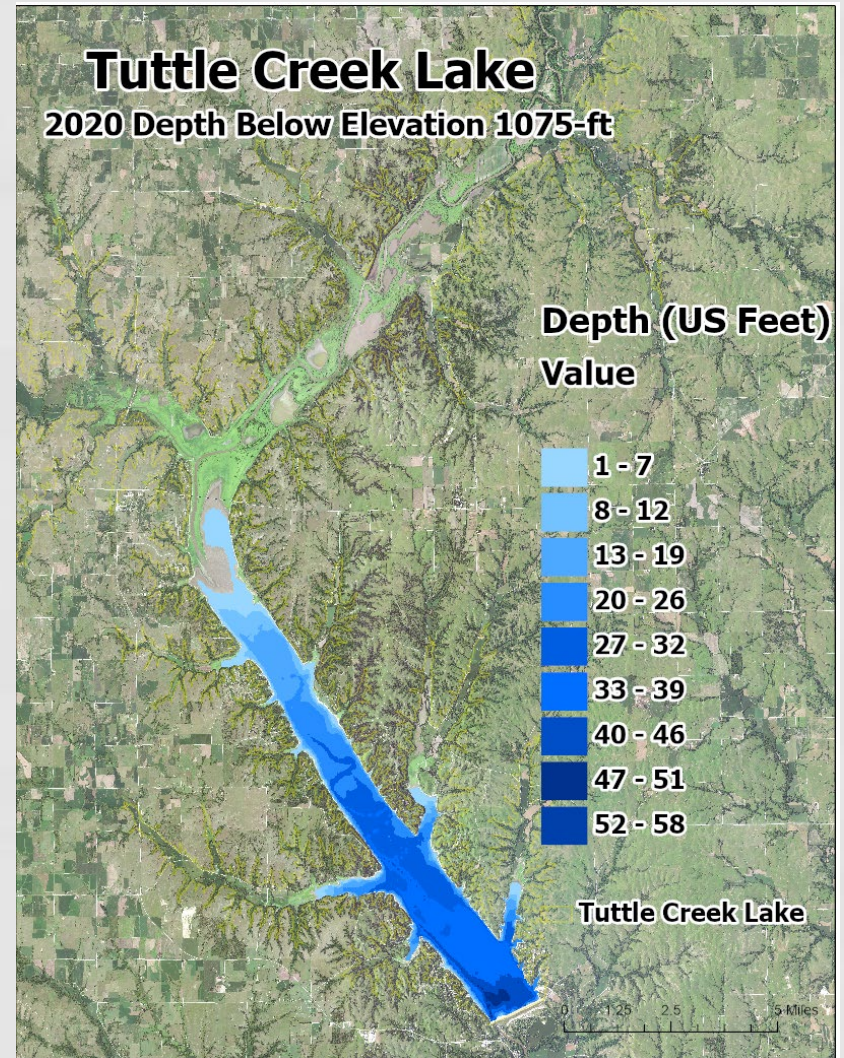
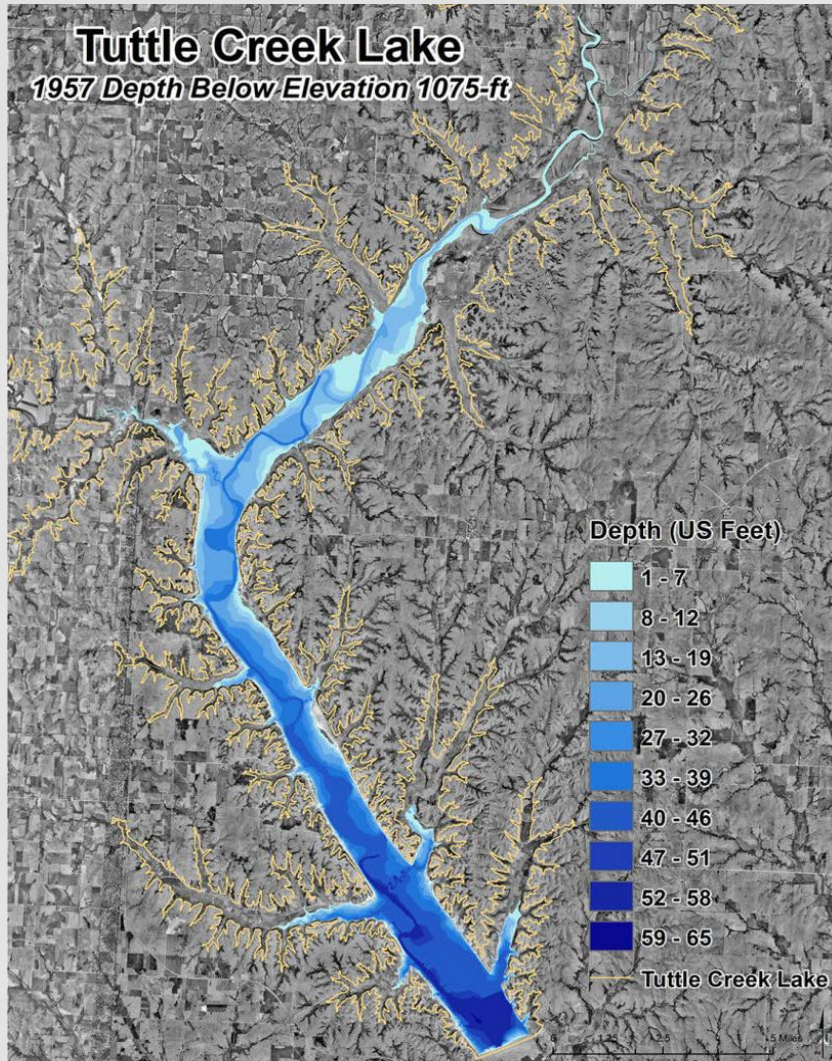
**US Army Corps  
of Engineers®**

# Reservoir Sediment Sustainability





# Tuttle Creek Lake: 1957 to 2020

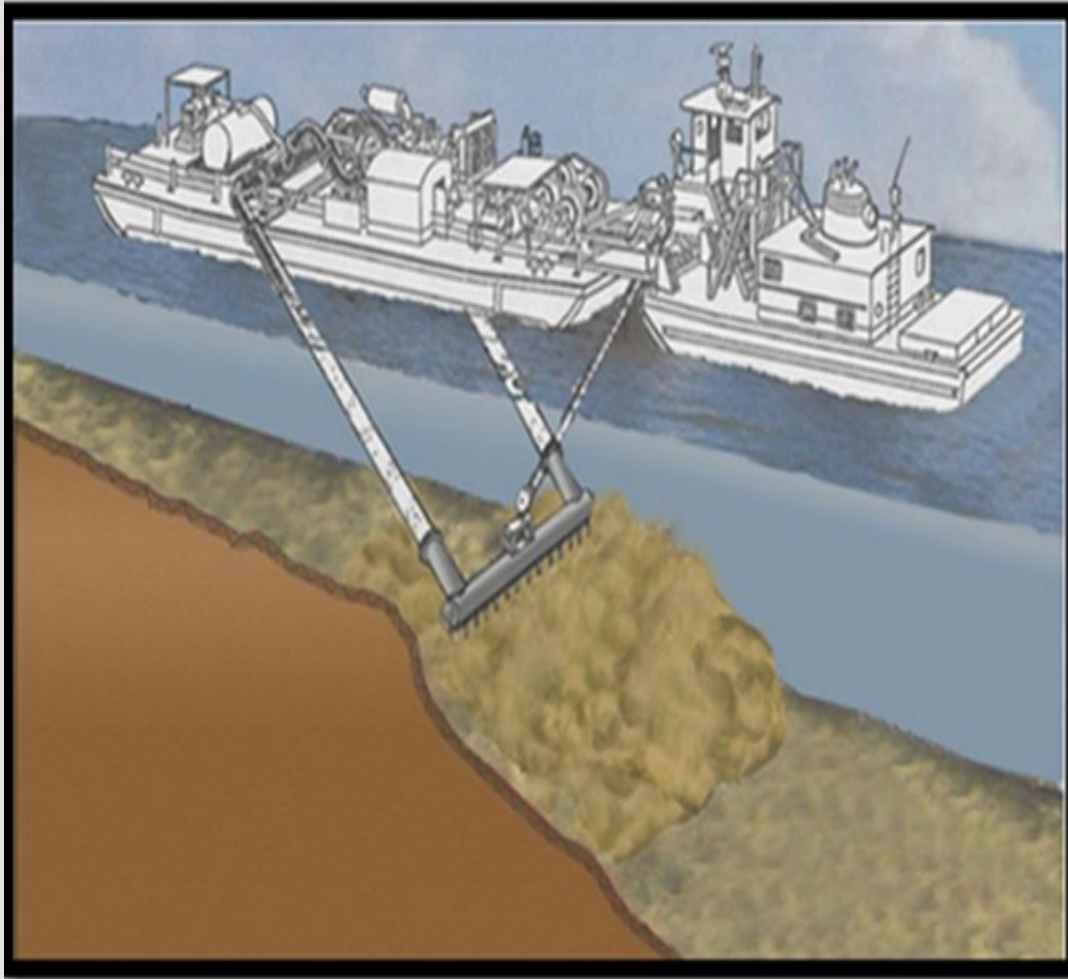


# Traditional Dredging Cost

- John Redmond Reservoir dredging project (May – October 2016)
  - 3,000,000 CY of sediment removed
  - \$20 million ~ \$6.67/CY (~\$3.00 transport/disposal)
- Tuttle Creek Lake sedimentation
  - 3,800 ac-ft/year (~6,000,000 CY)
  - At \$6.67/CY = \$40 M/year



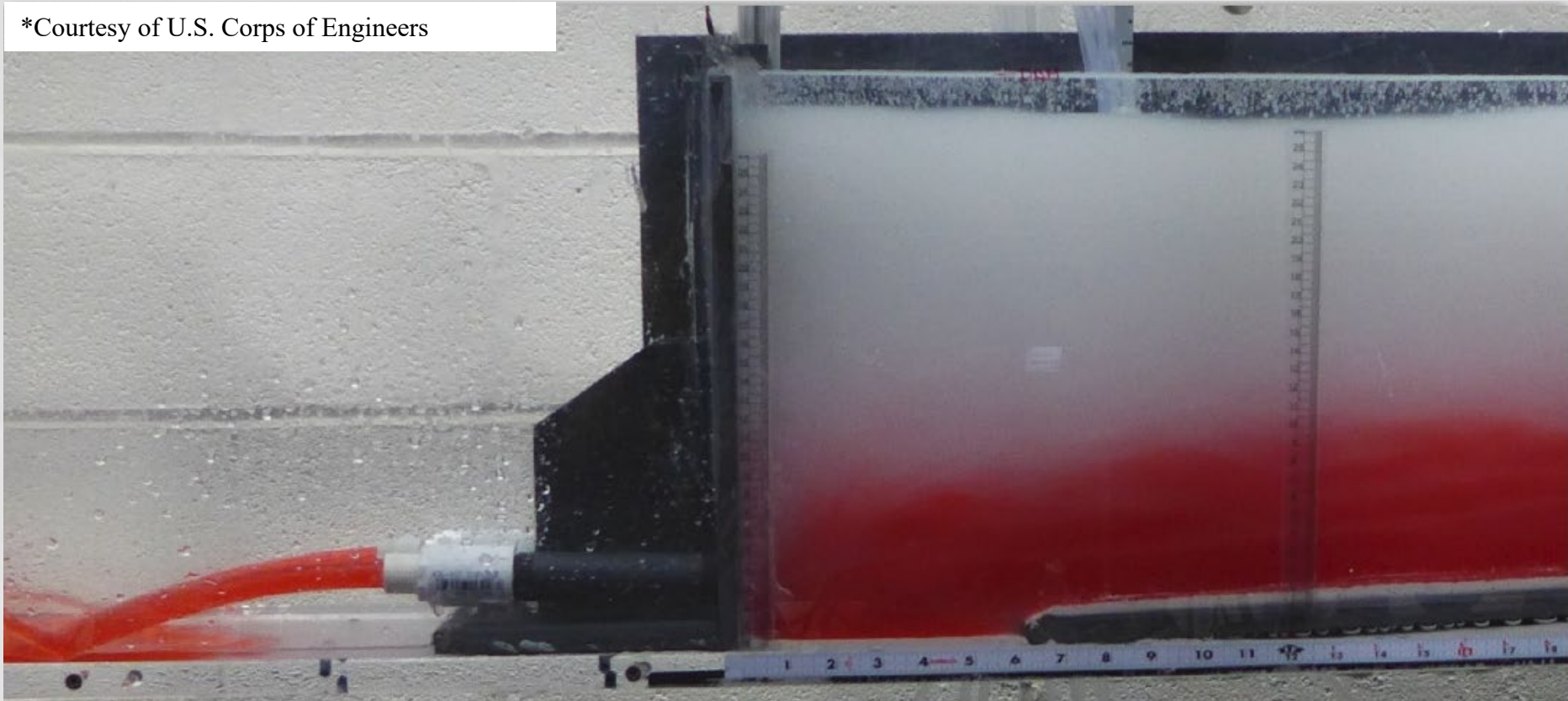
# Water Injection Dredging



- Inject water into the sediment deposits to induce a density current
- Open the gates and release the sediment through the existing conduit

# Density Current Venting

\*Courtesy of U.S. Corps of Engineers



# Tuttle WID Demonstration Funding

- Background research, planning, and development of the project since 2018 have been funded by various sources, including Planning Assistance to States (PAS) agreements with the USACE and funding through the USACE Engineer Research and Development Center (ERDC)

## **State Funding**

- Appropriations of \$975,000 in FY22 and \$1,025,000 in FY23 for Tuttle WID Demonstration
- Total State funding of \$2,000,000 for the Demonstration

## **Federal Funding**

- USACE received \$1.3 million in Federal Year 2022
- Additional Federal funding to cover remaining project need, contingent on the budget process, is anticipated in Federal Year 2023



# WID Research Ideas Workshop

- Meeting held June 1 in Lawrence to generate ideas related to research, surveying, and monitoring for the WID demonstration
- Pre-, during, and post-WID measurements and analysis
- WID effectiveness, environmental effects, human use considerations
- Feedback will be used to inform monitoring and implementation plans

# Next Steps

- Completed Research and Development Report
- WID Procurement
- Continued development of the monitoring and implementation plans
- Demonstration will occur no sooner than 2023

# Kansas/Colorado Arkansas River Water Quality Summit Update

Presented by: Tom Stiles



# KS/CO Ark River WQ Summit

KWA Meeting, June 22, 2022

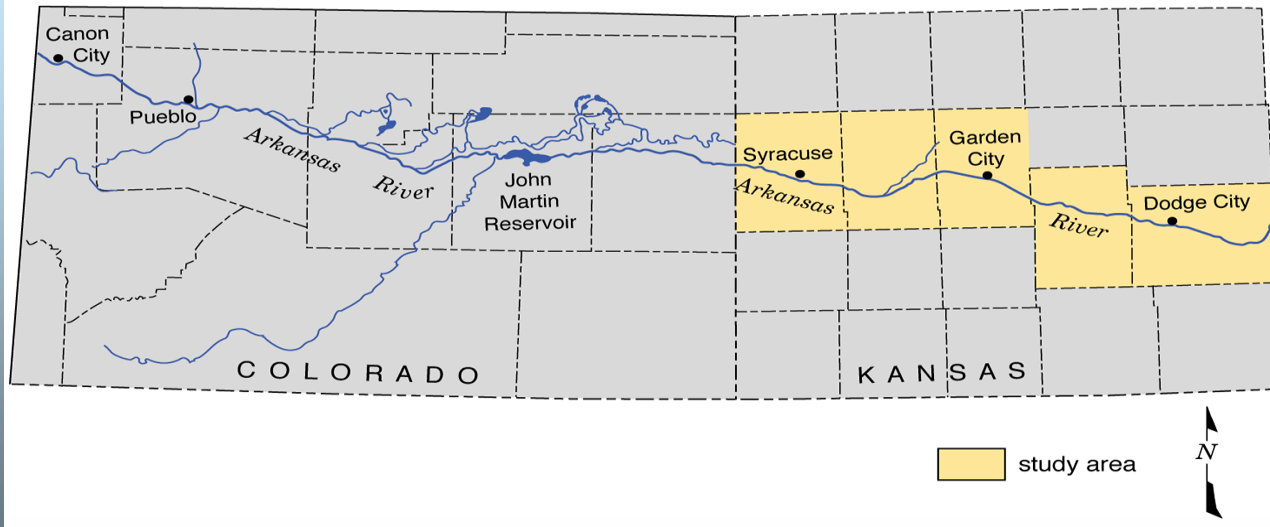
## Arkansas River Water Quality Summit



Lamar, CO &  
Garden City, KS  
May 10 – 12, 2022  
~ 40 Individuals Split  
Evenly Between the  
States

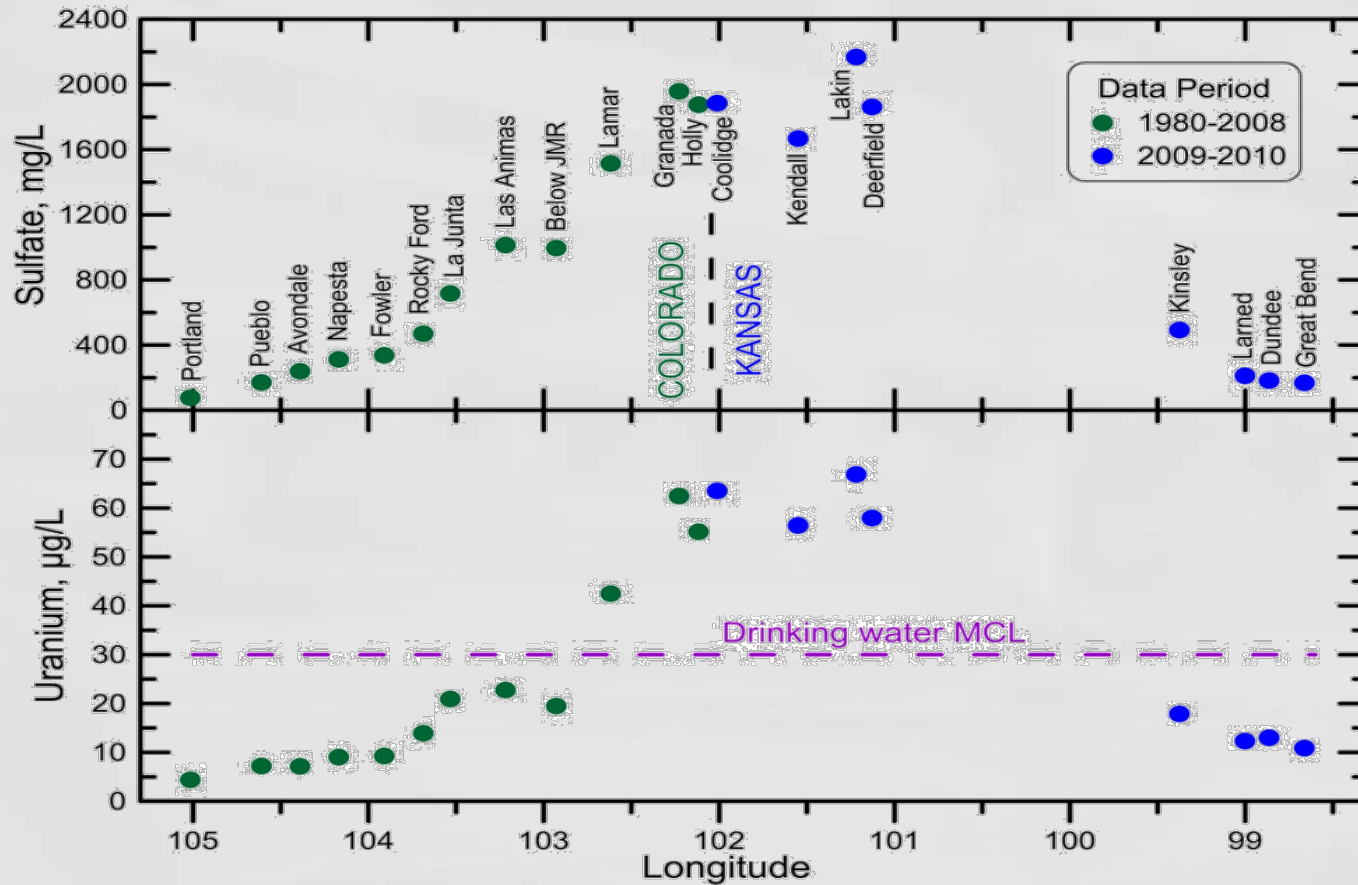
## Geographic Setting of Arkansas River WQ Issue

Natural Drainage and Canals in the Arkansas River System

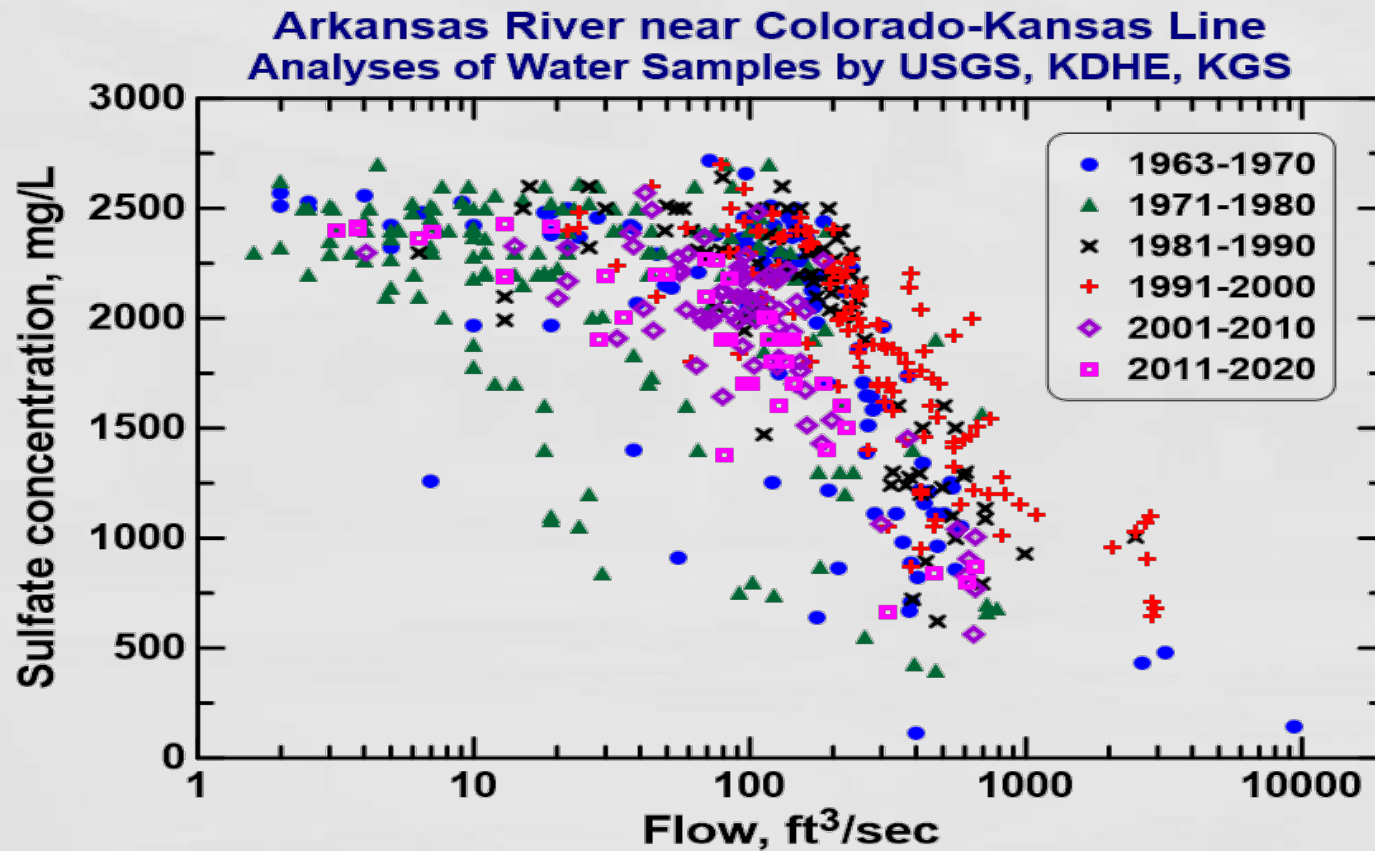




# Arkansas River Longitudinal Water Quality Patterns



## Arkansas River Stateline WQ as a Function of Flow

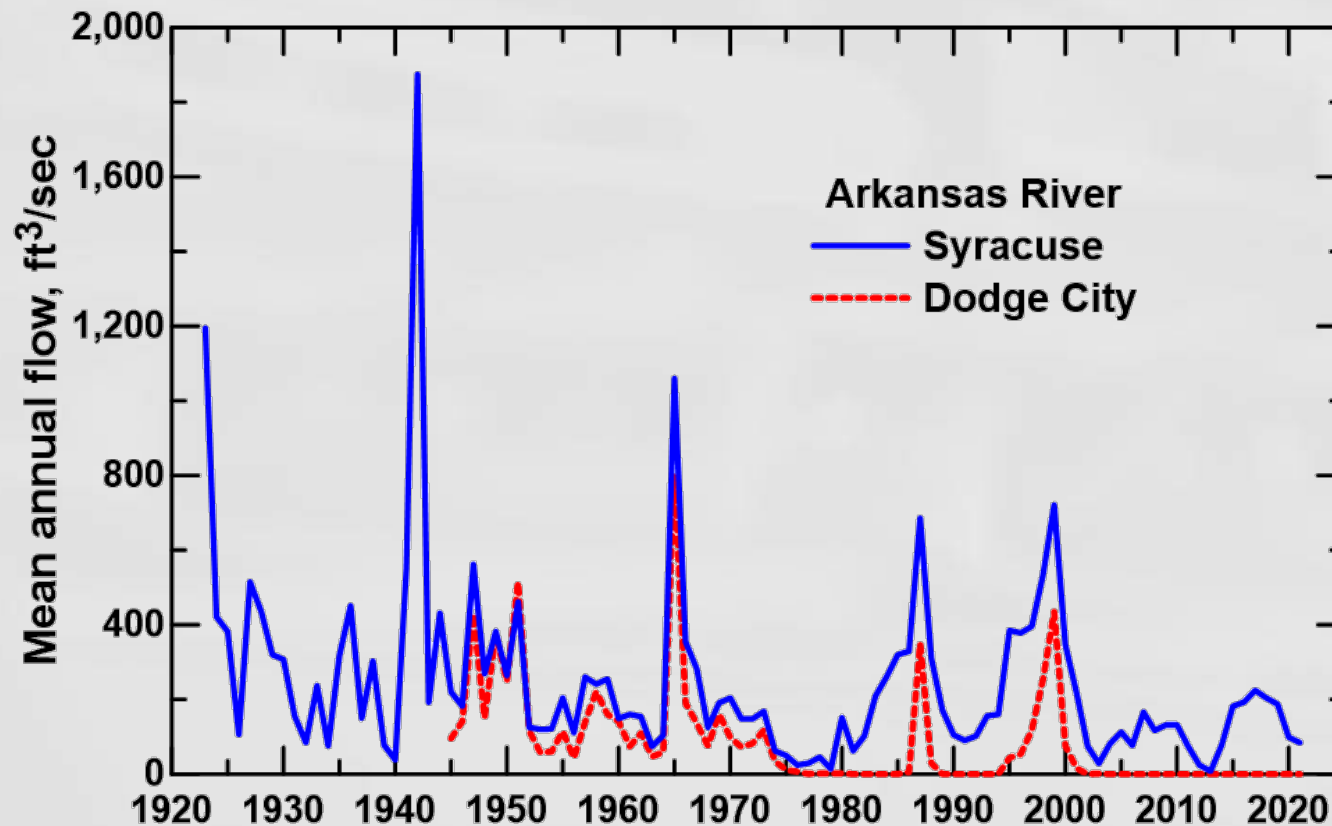




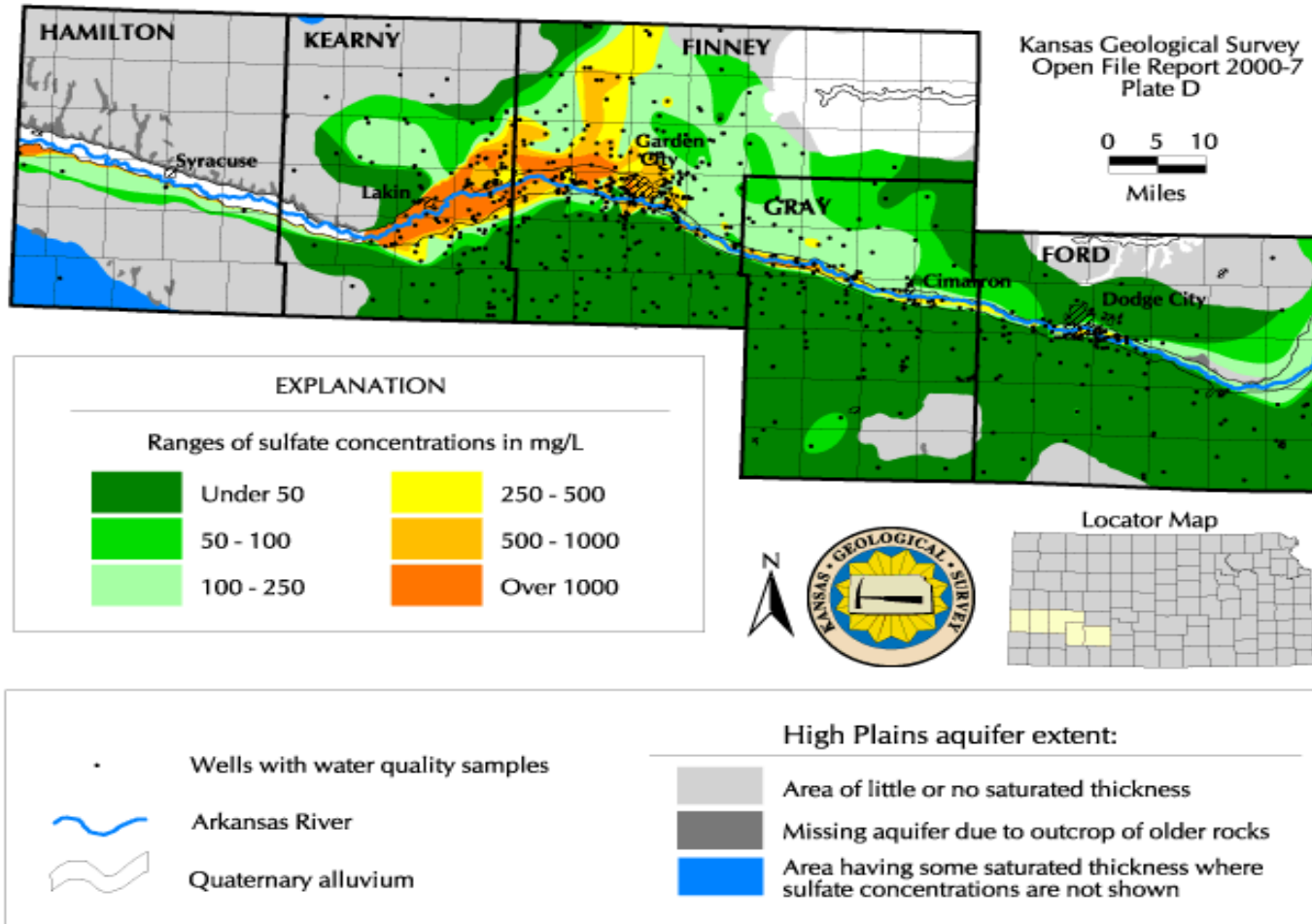
## Emerging Arkansas River Water Quality Issue: Uranium

Year	Mean annual flow, ft <sup>3</sup> /sec	Estimated mean annual uranium concentration, µg/L	Estimated annual uranium load, ton/yr
2012	29	73	1.98
2013	27	76	1.78
2014	92	63	4.15
2015	196	50	6.63
2016	202	51	8.23
2017	235	52	10.03
2018	207	54	9.28
2019	186	54	8.20
2020	107	59	5.33
2021	92	57	4.31

## Arkansas River Has Become a Sink in Finney County



## Sulfate Concentration for the High Plains Aquifer in the Upper Arkansas River Corridor in Southwest Kansas



## Impacts on Ground Water and Irrigation



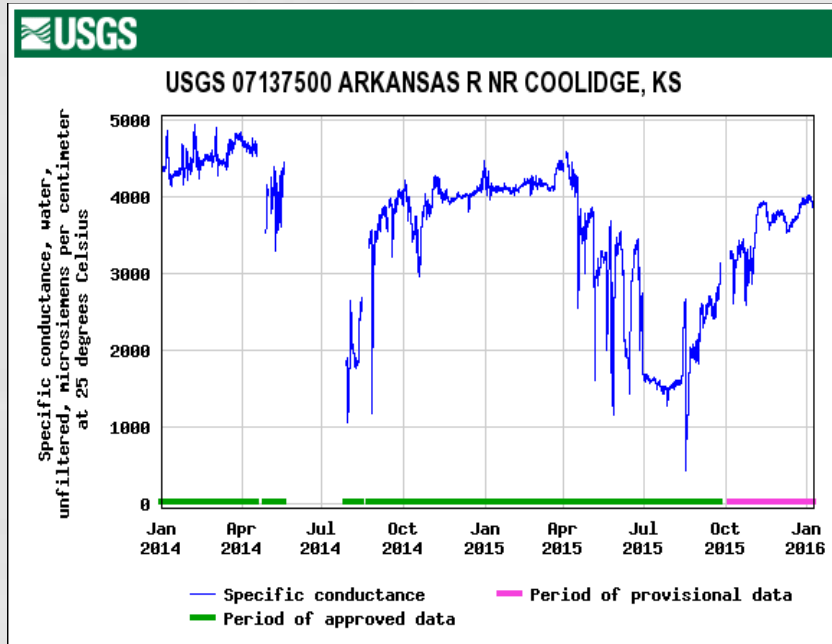
- Water quality impacting yield
- Managing for Selenium/Salinity is counter to limited irrigation
- Bioaccumulation in roots
- Looking at cover crops as a potential mitigation strategy
- Impacts useful life of irrigation technology equipment
- Water is corrosive – add PVC pipe to Pivots
- Fluctuations in specific conductance/Water quality
- Galvanizing no longer effective
- Dairy wastewater better yield

## Impacts on Public and Domestic Water Supply



Treatment costs  
Disposal  
Delivery of wholesale water  
Infrastructure upgrades and expansion  
Sampling private wells, not just Public Water Supply  
Private treatment such as activated carbon and reverse osmosis at homes, but there is no cost share  
Do we need additional private well sampling?

## Key Takeaways from the Summit



Coloradoans realized Kansans are truly being impacted by water quality

Kansans realized Coloradoans have been working to mitigate salt loadings

Money is needed, but so is technical assistance

Ongoing, shared information and data are key to building collaboration

Conduct joint bistate meeting each Summer

Make ongoing topic at ARCA, Upper Ark RAC, Colorado WQ Forums

## Next Steps

Formulate short and long term goals coming out of Summit

Brief both states' Congressional delegations this Summer

Convene meeting with Federal Agencies in Fall

GMD#3 initiates Ark River Stakeholder Planning project (June 29)

Create dashboard for information sharing across stateline

Direct more funding and attention toward areas of concern

Colorado priority on source control

Kansas priority on impact mitigation

Focus 319, NWQI, CREP, Partnerships (TNC, DU, KAWS)

## Shout Out to the Following for Making the Summit a Success

Susan Metzger, KCARE, Kansas State

Kevin Salter and Rachel Duran, DWR Garden City Field Office

Don Whittemore, KGS (retired, sorta)

Kenan Diker and Aimee Konowal, Colorado Water Quality  
Control Division



Title of Presentation Goes Here

**Thank you/Questions**



# Dealing with Nitrates in Kansas

Presented by: Tom Stiles & Travis Sieve



**Addressing Nitrates in Kansas**  
**Tom Stiles & Travis Sieve, KDHE**  
**KWA Meeting – June 22, 2022**

## Implications of Nitrate

- *NO<sub>3</sub>, Naturally Occurring; Often Linked with Nitrite, NO<sub>2</sub>*
- *Nitrite presents the toxic effects, forms methemoglobin*
- *Excessive methemoglobin restricts oxygen transport, especially in infants (blue baby syndrome)*
- *Other potential health impacts: birth defects, lowering of blood pressure (medication interaction), thyroid disease, colon cancer...generally long term consumption risk developing disease*
- *MCL = 10 mg/l as nitrogen; (essentially 10.49 mg/l)*
- *Ground Water Presence Creates Oxidizing Environment, Liberates Selenium and Uranium*

# Nitrates in Public Water Supplies

In 2020, 15 PWS systems, serving 6932 people, saw 27 violations of the nitrate MCL

PWS monitoring occurs annually

If 1 sample > 5 mg/l; monitoring becomes quarterly

If 1 sample > 10 mg/l; Public notification is given within 24 hours

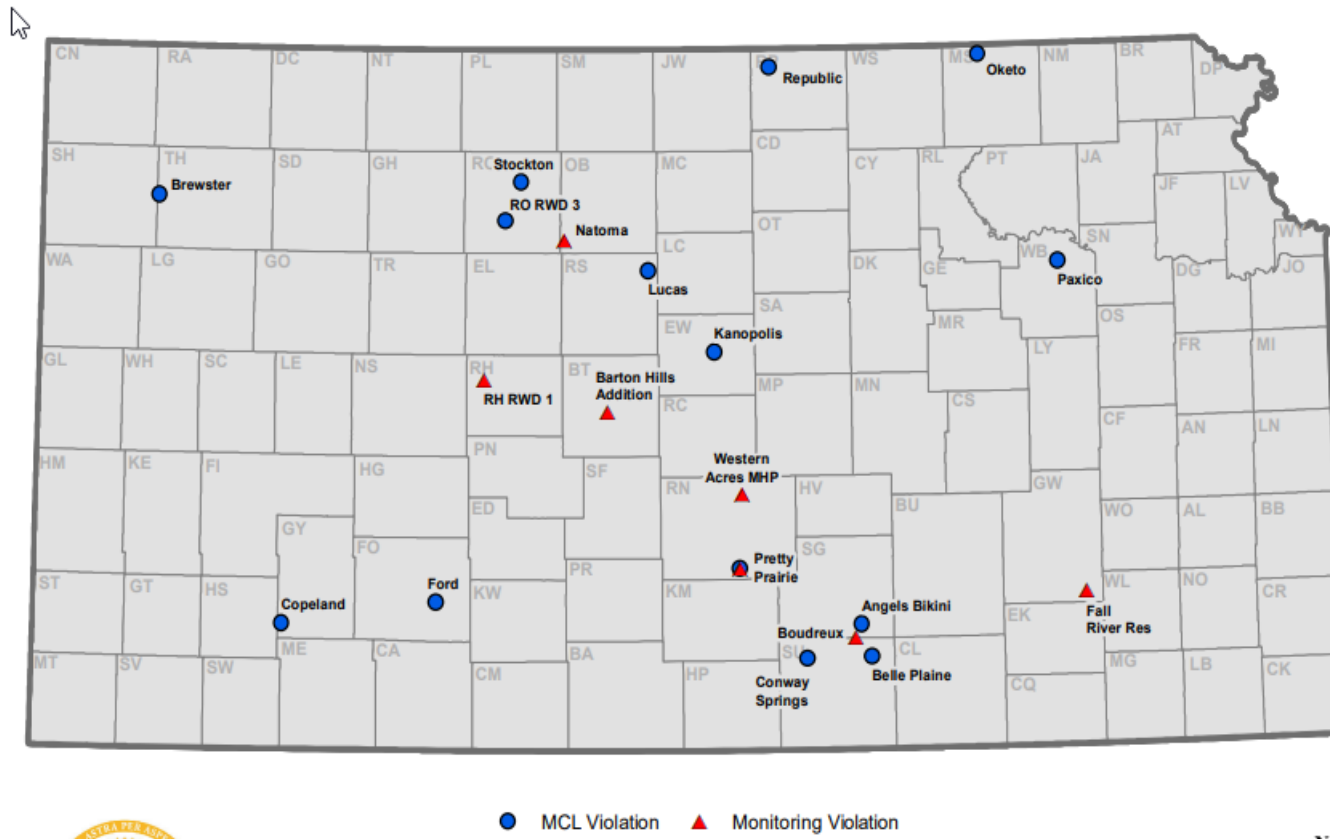
If 2 samples > 10 mg/l; treatment is warranted

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## Figure 12: Nitrate Violations



# Repeat Violations Lead to Corrective Action

Treatment means to remove or reduce nitrate to produce finished water < 10 mg/l

- Reverse osmosis

- Ion exchange

- Blending strategies

- New or relocated wells

- Interconnection to new source

Providing bottled water is not a solution, but a contingency tactic in the short term

Current Drinking Water SRF Intended Use Plan lists five projects dealing directly with nitrates

- \$600,000 for a new well

- \$1.5 – 6 million for new water treatment plant (may include costs for waterline & storage replacement)

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# PWS Challenges

Cost of Treatment, particularly for small population systems

Declining populations

Fixed incomes; little discretionary income to direct toward utility fees

Operation and Maintenance Costs

Supply Chain Complications for Parts and Materials

Retention of Trained Operators

Timing of Financing and Constructing New Water Treatment Plants

Disposal of post-treatment waste streams

Non-Q lagoons with liners

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# Miscellaneous Observations on Nitrate

Largely a ground water issue in Kansas; natural, legacy, fertilizers, manure

9 Streams have seen excessive (>10 mg/l) nitrate on impaired waters list; 4 of those have subsequently been declared compliant with WQS

Cedar Creek (Olathe)

Sand Creek (Sedgwick)

Big Creek (Hays)

Arkansas River at Derby (Wichita)

Little Caney River (Caney)

Smoky Hill River near Salina (Salina)

Indian Creek (Jo Co)

Little Cow Creek (Lyons)

Roys Creek (NPS)

Lake Eutrophication and HABs often triggered by combination of excessive phosphorus and nitrogen

KDHE - Remediation investigations on nitrate contamination are at some stage at over 350 locations

Often entails finding responsible parties to conduct the cleanup operations

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# Mitigating Nitrates

## Treatment

- Faster option....but,
  - Treatment cost can be in the millions
  - Yearly operation/maintenance cost
  - Doesn't stop sources of nitrates from becoming
  - Smaller populations don't have treatment as a

## Prevention

- Slower to see response
  - Requires some investigation into nitrate source
  - Voluntary participation from PWS and locals
  - Cheaper in the long term
  - Requires future thinking of PWS

**AN OUNCE OF  
PREVENTION IS  
WORTH A POUND  
OF CURE**

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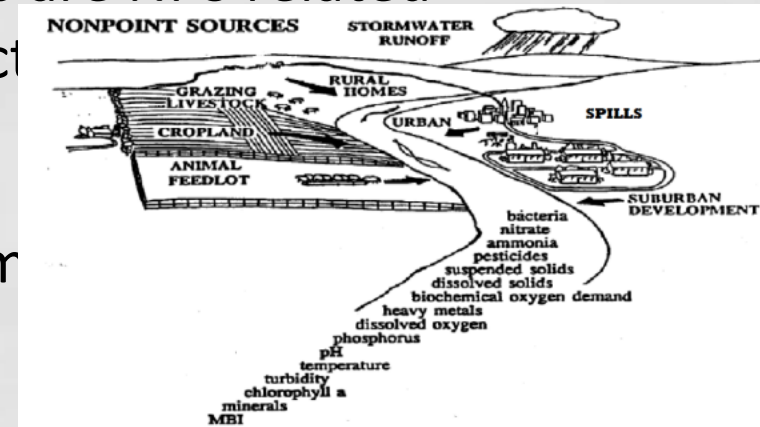
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# Mitigating Nitrates

Watershed Management Section (KDHE) implements programs to focus efforts caused by Nonpoint Source (NPS) Pollution

- Many times the sources of nitrates are NPS related
- Watershed Restoration and Protection
  - Surface Water Focus
  - Larger Drainage
- Drinking Water Protection Program
  - Ground Water Focus
  - Public Water Supply area (smaller)



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# Drinking Water Protection Program

Designed to help smaller communities

- Voluntary program
- Identify pollutant sources
- Plan mitigation strategies to address nitrate sources (and other contaminants)
- Implement planned strategies
- Evaluate future needs and progress
- Long-term planning

Communities

- Smaller communities (<1000)
- Have exceeded MCL or trend upwards in nitrates
- Treatment cost barriers
- Build a local leadership team

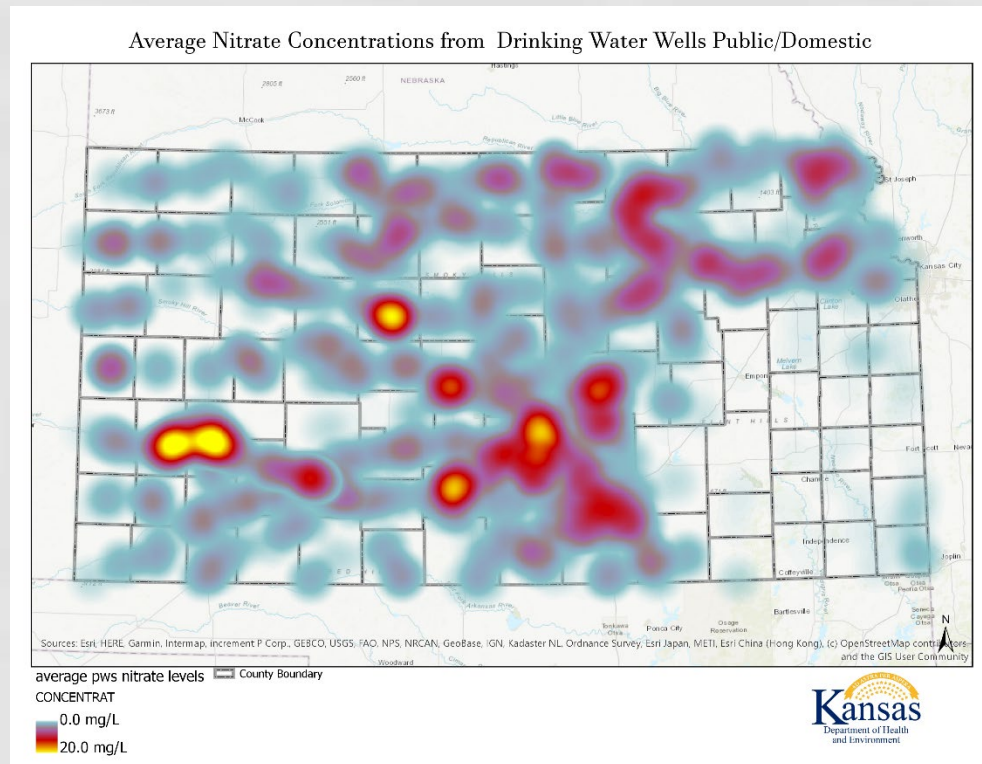


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# Drinking Water Protection Program



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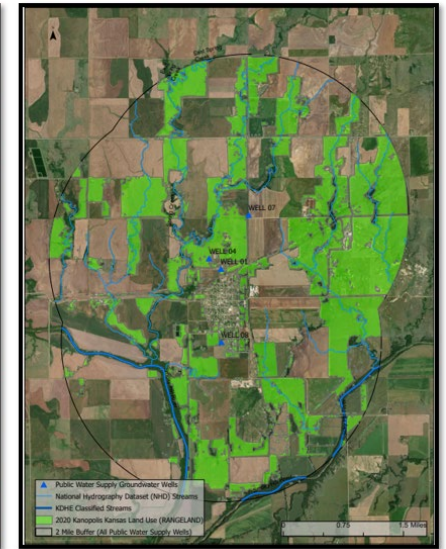
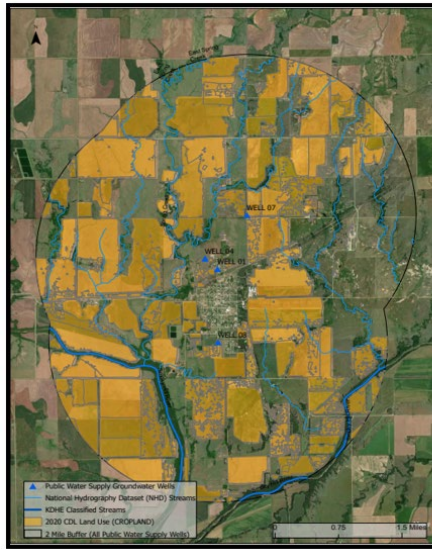




# Drinking Water Protection Program

## Assessments

- Investigations into the type of nitrate contamination
  - NPS or responsible party (point source)
  - Organic or inorganic (people/livestock, fertilizer)
  - Area “hotspots”
- Land use
  - Current and historic
  - Aerial assessments/ground-truthing
- Groundwater Information
  - Flow, depth, nitrate levels
  - Volunteer use of existing wells
- PWS Infrastructure



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# Drinking Water Protection Program

## Planning and Implementation

- Plan area concentrated around wells
- Best Management Practices (BMPs) designed based off land use, nitrate source, and local “buy-in”
  - Soil Health
  - Livestock Relocation
  - Buffers/Filters
- Funding
  - Assessments/Implementation – State Water Plan
  - PWS Infrastructure – Safe Drinking Water Act SRF
  - Technical Assistance– Safe Drinking Water Act
  - Leveraged Resources

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# Watershed Restoration and Protection

Surface water focus      **Strategy**

- Nutrient impairments on streams/lakes

## Nutrient Reduction Strategies

- All WRAPS have nutrient reduction focus
- Partnership allows for cost-share practices for reduced nutrients
- Active WRAPS
  - Build strategies for specific water bodies impaired by nutrients



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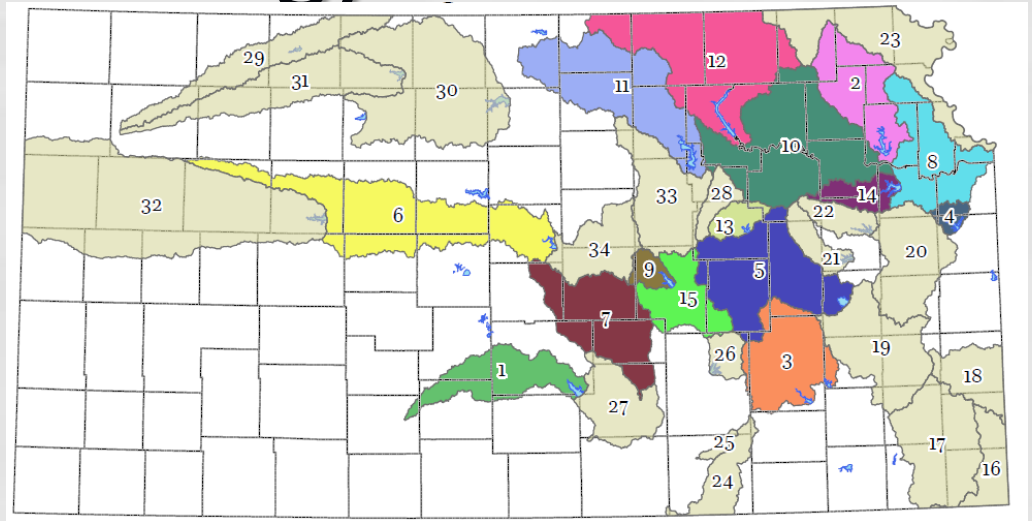
# Watershed Restoration and Protection Strategy

## 14 Active WRAPS Projects

Coordination through Sponsoring Organization

## 1 KACD-WRAPS Partnership Project

Cost-Share program partnering with local Conservation Districts



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# Watershed Restoration and Protection Strategy

## Strategies/BMPs

- Similar to ground/surface
  - Soil health/livestock relocation/range management
  - Modeling reductions for planning
- Financial incentives
  - Use of SWP and Federal Funds
  - Leverage other local, state, and federal resources
  - Industry Resources (General Mills, ESMC, etc.)
- Technical needs
  - Volunteer actions
  - Coaching/Mentoring (KDHE Farmer to Farmer, Understanding Ag, etc.)
  - Equipment needs for soil health (Hagie Interseeders)
- Networking
  - Building statewide capacity for agricultural changes to improve water quality (Soil Health Alliance)
- Information/education
  - Workshops, events, etc.

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**LUNCH BREAK**

**Meeting will resume soon**

# Kansas Water Success Stories

Presented by: Earl Lewis

# Kansas Dam Safety Update

Presented by: Earl Lewis

# Kansas Water Authority Open Discussion

Presented by: Dawn Buehler



# Kansas Water Authority Ex Officio Agency Update

Presented by: Dawn Buehler

# Director's Report

Presented by: Connie Owen

# New Business

# Adjourn

## Upcoming Meetings:

- August 10, 2022 – Water Policy Discussion, Salina
- August 17, 2022 – Kansas Water Authority, Manhattan
- October 19, 2022 – Kansas Water Authority, TBD
- November 16-17 2022 – Governor's Conference on the Future of Water in Kansas, Manhattan
- December 14, 2022 Kansas Water Authority, TBD